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Abstract Book

9th Arab Congress of Plant Protection

Congress Palace, Damascus, Syria

19-23 November, 2006



Organized by

Arab Society for Plant Protection

& General Commission for Scientific Agricultural Research, Syria

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Edited by

S.G. Kumari, K.M. Makkouk, S. Al-Chaabi and A. El-Ahmed

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Symposia

Symposium One: Invasive Pest Species: Identification and Potential Control

Symposium Two: Policy and Developmental Issues in Plant Protection

Symposium Three: Pest Management without Synthetic Chemical Pesticides

Symposium Four: Molecular Diagnostics of Plant Pest Species

Symposium One: Invasive Pest Species: Identification and Potential Control

S 1

THE IPPC AND PREVENTION STRATEGIES FOR THE SPREAD OF INVASIVE ALIEN SPECIES. Jeffrey Jones, Agricultural Officer, Plant Protection Service, FAO Rome, Italy, Email: Jeffrey.jones@fao.org

The International Plant Protection Convention (IPPC) is a legally binding international agreement currently with 157 contracting parties. Its mandate is to secure common and effective action to prevent the spread and introduction of pests of plants and plant products and to promote appropriate measures for their control. As well as commercial crops, the scope of the convention also covers organisms that threaten biological diversity and the environment and so extends to uncultivated flora. Invasive Alien Species (IAS) and Living Modified Organisms (LMOs) are addressed under the framework of the Convention and have been expressly accommodated in the IPPC International Standard for Phytosanitary Measures (ISPMs) on pest risk analysis, which is the process that is applied to determine what measures may be necessary for the safe import of plants plant products and other regulated articles. Risks posed by deliberate or unintentional introduction regarding IAS can be effectively minimised through international cooperation, information sharing and the application of technically sound management options derived from carefully considered pest risk analyses. Strong national regulatory systems supported by appropriate functional Regional mechanisms (e.g. Regional Plant Protection Organizations) are fundamental requirements in a wider strategy to prevent the spread of IAS.

S 2

TRANSBOUNDARY PLANT PESTS: NEW OPPORTUNITIES FOR IPM STRATEGIES THROUGH INTERNATIONAL NETWORKS. P. E. Kenmore, Senior IPM Officer, Plant Protection Service, FAO Rome, Italy, E-mail: Peter.kenmore@fao.org

For over 30 years most major plant pest (including diseases, weeds, and vertebrates) outbreaks have been the result either of production intensification or of transboundary pest movement. A larger number of IPM programmes have been designed and carried out for many of these in more countries than previously. Especially for transboundary pests, information technologies, particularly those based on the Internet, have created practical opportunities to share lessons learned, identify critical factors for detection and subsequent management, and assess longer term environmental consequences of management programmes. These programmes have succeeded in protecting higher production while reducing pesticide-associated risks. International agreements on pesticides and on organisms imported as biological control agents reflect a growing global consensus that human health and the environment must be better protected. New technologies developed in applications for human and veterinary medicine have also become more widely applied to plant pests. Case studies of IPM strategies for transboundary pests including coconut leaf beetles in Asia and the Pacific, soybean rust in Africa, Asia, South America, and North America, banana bacterial wilt diseases in Latin America, Africa, and Asia, and rice planthoppers in Asia illustrate driving forces. Earlier detection, farmer participatory approaches, ecosystem analyses, and impact assessment of programmes. The relevance of these experiences for transboundary pests of the Near East and North Africa, such as red palm weevil of dates and citrus tristeza virus will be explored.

Symposium Two: Policy and Developmental Issues in Plant Protection

S 3

RELEVANCE OF CROP AND FOOD BIOSECURITY RESEARCH IN THE NEAR EAST REGION. Maria Lodovica Gullino, Centre of Competence for the Innovation in the agro-environmental sector, University of Torino, Via Leonardo da Vinci 44, 10095 Grugliasco, Italy, Email marialodovica.gullino@unito.it

Agriculture and its related sectors are essential to the social, economic and political stability of any country. A disruption of agricultural activities may have widespread dramatic economic consequences in the food and fibre sector. In Europe, as well as worldwide, most attention has been devoted to bioterrorism events having human health as main target and a European Commission Task Force on bioterrorism has

been established. The research activities carried out on agroterrorism are still very limited, but a strong increase in interest is expected. From one side the European Union, throughout its VIIth Framework Programme, as well as other Agencies are expected to strongly increase investments in research on security. On the other side, more and more scientists are attracted by topics related to crop biosecurity. Cooperation on a global scale is essential in order to be able to cope with a global problem, because pathogens and pests cross the boundaries of single nations. The relevance of research in this field in the Near East Region will be discussed, also in relation to the development of effective policies.

S 4

THE COLLABORATIVE RESEARCH SUPPORT PROGRAM (CRSP) AS A MODEL FOR TECHNOLOGY DEVELOPMENT AND TRANSFER IN THE ARAB COUNTRIES, WITH SPECIAL EMPHASIS ON PLANT PROTECTION. E. A. "Short" Heinrichs, Department of Entomology, University of Nebraska, Lincoln, NE 68583-0816, USA, Email: eheinric@vt.edu

The IPM CRSP develops and implements approaches to IPM that help raise the standard of living and improve the environment in countries around the world. The IPM CRSP model is based on (1) participatory IPM, (2) networking, (3) capacity/institution building, (4) research and technology development and (5) technology transfer. Regional programs in Central Asia, East Africa, West Africa, Latin America/Caribbean, Eastern Europe, South Asia and Southeast Asia address problems of a specific region and the global themes, invasive species, information technology and databases, regional diagnostic laboratories, insect transmitted viruses, and impact assessments deal with universal issues. Major crop emphasis is on vegetables and fruits.

S 5

DEVELOPMENT AND RISK ASSESSMENT OF TRANSGENIC CROPS. M. Baum and M. Madkour, International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: m.baum@cgiar.org

The International Center for Agricultural Research in the dry Areas (ICARDA) is exploring the possibility of using genetic engineering to achieve improved tolerance to fungal, drought and other abiotic stress resistance. Chickpea and lentil transformation is being done in cooperation with the University of Hannover, Germany. Cereal transformation is being carried out jointly with the Agricultural Genetic Engineering Research Institute (AGERI) in Cairo, Egypt and the Centre for Biotechnology, (CBS) Sfax, Tunisia. With the first products are becoming available, risk assessment need to be undertaken and risk management strategies to be developed. The countries of the Fertile Crescent are located in the center of diversity for many of our agricultural crops. Most of our agricultural crops (barley, wheat, lentils, chickpeas) are inbreeding species and the level of out-crossing is rather low (0-2%). Nevertheless, studies that quantify the exact amount of geneflow are being conducted to allow the development of science based risk assessment strategies. Deployment of transgenic crops to areas outside the center of diversity (e.g. North Africa, South Asia) is another strategy to be followed. For this reason, the development of biosafety frameworks and biosafety regulations that allow the testing of transgenic crops in countries outside the center of diversity is encouraged and supported.

Symposium Three: Pest Management without Synthetic Chemical Pesticides

S 6

IPM AND ORGANIC FARMING. Mohamed El-Said El-Zemaity, Plant Protection Department- Faculty of Agriculture, Ain shams University, P.O. Box 68, Hadeyk Shoubra, 11241 Cairo, Egypt, Email: mselzemaity@hotmail.com

Organic farming has been increasingly spreading in recent years not only globally but also in the Arab countries. Organic farming is a system of production that uses practices and materials which are naturally/biologically enhancing to the soil, plant life, animal and human consumers and growers. Organic farming is based on producing food in a sustainable manner without using synthetic chemicals, either at the growing stage or post-harvest. Generally, the sales of organic products have increased 20% annually since 1990. Crop production and pest control methods in organic agriculture are governed by strict standards and

rules imposed by the International Federation of Organic Agriculture Movements (IFOAM) and national regulations. Unfortunately, enhancement of soil quality and cultural practices are not always effective for controlling pests in organic agriculture. Therefore, IPM is essential in organic agriculture because it offers a wide range of techniques and practices to prevent or minimize damages from pests without affecting soil, water or beneficial organisms. Thus, IPM is not just about management of pests alone, it is a sustainable crop production based on sound eco-system analysis. However, this approach has certain constraints or challenges such as: (i) IPM is still not suitably recognized as policy or a solution to some problems, and the area of concern will need more personal attention especially in developing countries, (ii) implementation of this system is labor-intensive which is not widely available, (iii) growers, in some years, may suffer from crops damage and reduced yield to a larger extent than expected, (iv) there is no effective non-chemical control method or bio-control agent available for some pests (insects, weeds or pathogens), and (v) available funds for research in this area is limited. To overcome such constraints and improve the effectiveness of IPM programs through better understanding of the crop ecosystem both above and below the soil surface is needed. Furthermore, new systems for organic agriculture need to be designed, where the crop environment discourages pest development. The role of training of organic farmers and farm groups will be emphasized.

S 7

CURRENT SITUATION OF VEGETABLES GRAFTING AS ALTERNATIVE TO METHYL BROMIDE. Mohamed Besri, Institut Agronomique et Vétérinaire Hassan II, B.P. 6202 Rabat, Instituts, Morocco, Email: m.besri@iav.ac.ma

Grafting is one of the most promising techniques used for the substitution of methyl bromide. Grafting uses resistant rootstocks to protect susceptible vegetables against soil-borne fungi (*Verticillium dahliae*, *Pyrenochaeta lycopersici*, *F.oxysporum* f.sp.*radicis lycopersici*, *Fusarium* wilts, *Phytophthora* spp ... etc.) and root-knot nematodes (*Meloidogyne* spp.). In addition to the soil borne pathogens control, vegetable grafting has also many other purposes such as growth promotion and yield increase, low temperature tolerance, growth period extension and fruit quality. This technique, which was considered too expensive, is now widely used in many developing and developed countries at a commercial level because mainly of the grafted seedling prices decrease, the reduced grafted plants population /ha and the higher yield and quality. In tomato protected cultivation, the non grafted and grafted tomato plant population per ha are respectively about 20,000 (one stem per plant) and 10,000 plants/ha (2 stems/plant). When grafted plants are used, the same yield or a higher one could be obtained with this half plant population. The quality, expressed as % of exported production is also higher. In many countries, most of the vegetables production, particularly in protected cultivation, is obtained from grafted plants. For example, in Spain, 100% of the watermelon crop is raised from grafted plants, a practice that eliminated the use of MB on the crop in the Spanish south east, when combined with other treatments. However, the wide commercial use of grafting can be limited by the availability of rootstocks tolerant to local pathogens. Rootstock resistance may break down with the emergence of pathogens new races and under some environmental conditions e.g. high temperature, salinity. Mechanical grafting techniques are available and widely used in many countries.

S 8

THE USE OF NON-CHEMICAL ALTERNATIVES TO SYNTHETIC PESTICIDES IN MAINTAINING PLANT HEALTH IN A CLONALLY PROGATED CROP: POTATO. Edward B. Radcliffe, Department of Entomology, University of Minnesota, St. Paul, Minnesota, USA 55108-6125; Email: RADCL001@umn.edu

Aphid transmitted viruses are the primary cause of potato seed lots being rejected or downgraded for recertification. Farmers tend to consider insecticides their primary defense against current season spread of potato viruses in seed potatoes, but their use is of inconsistent benefit in limiting virus spread. Insecticides can interrupt PLRV spread from within field sources because of the extended post-acquisition latent period of this persistently transmitted virus. However, winged viruliferous aphids generally are not killed quickly enough to prevent PLRV spread even when aphidicidal residues are present. All other aphid-transmitted potato viruses are transmitted non-persistently and can be acquired and transmitted in feeding probes of seconds, making insecticides of little benefit. Non-chemical control alternatives to virus control include strategies to reduce infection exposure, e.g., limited generation seed increase, summer field inspections and

rouging to eliminate within field sources of virus inoculum, off-season grow outs of representative sub-samples of seed lots and decertification of those above virus incidence thresholds, spatial isolation of seed production from virus sources and severe vector pressure, temporal avoidance of vectors including early vine kill and environmental manipulations to reduce vector numbers. Floating row covers can be used to protect early generation seed increase. Planting crop borders around seed fields, 3-m wide is sufficient, and achieving uniform stands to minimize within field plant apparently to winged aphids can effectively limit vector colonization. Use of agricultural oils can limit spread of non-persistent viruses such as PVY, while insecticide applications targeted to field margins at the onset of colonization events can greatly reduce insecticide use and costs, while preserving natural enemies.

S 9

MICROBIAL INSECT PEST CONTROL: IS IT AN EFFECTIVE AND ENVIRONMENTALLY SAFE ALTERNATIVE? Monir M. El-Husseini, Center of Biological Control, Faculty of Agriculture, Cairo University, Giza, Egypt, Email: biologicalcontrol@hotmail.com

Entomopathogenic viruses, bacteria and fungi are currently used as alternatives to traditional insecticides. Its use should not be generalized because each pest has its own case. In specific cases, viruses proved very effective in managing populations of certain pests as for Lepidoptera and Hymenoptera forest pests in Europe and those introduced in forests in the USA and Canada; also, for controlling the cotton leafworm, potato tuber worm and greater wax moth larvae. They are specific to target insects and highly safe to mammals and the environment. Bacterial diseases like the Milky disease (*Bacillus popilliae*) successfully controlled the Japanese beetle grubs for 10 years after only one soil treatment. Each of the three subspecies of *B. thuringiensis* attacks larvae of a specific order, i.e., *B.t. kurstaki* for Lepidoptera, *B.t. israelensis* for Diptera and *B.t. tenebrionis* for Coleoptera. All commercial products of *B.t.* are free from exotoxins that pose hazards to man and all organisms in the environment. Some fungi are effective microbial control agents against certain insect pests only under conditions of high R.H. and temperature that are available in glass houses. That is why fungi are also effective at tropical and sub-tropical areas as against cacao insect pests in Brazil. In some instances, fungi (*Beauveria bassiana*) cause allergy to man. They attack non-target insects, adult parasitoids and predators. Thus, fungi have low specificity and pose hazards to biodiversity.

S 10

LURE AND KILL STRATEGY: A PROMISING SAFE APPROACH TO PEST MANAGEMENT THAT ALLEVIATES SYNTHETIC PESTICIDES USE. Aly H. Rasmy, National Research Centre, Dokki, Cairo, Egypt, Email: aly_rasmy@hotmail.com

Methods using insect stimuli to manipulate behavior of pests are discussed. The light is shed on how to combine insect stimuli with other safe means in integrated control strategies to increase the efficacy of these approaches. The main components of these strategies are pest monitoring, semiochemicals, host-plant resistance, trap crops and selective pesticides or biological control agents. These components are combined under the term lure and kill strategy or push-pull strategy. Research should continue to study how insects produce pheromones, how they trigger a response and the influences of these responses.

Symposium four: Molecular Diagnostics of Plant Pest Species

S 11

MOLECULAR DIAGNOSTICS OF FUNGAL PATHOGENS. Epaminondas J. Paplomatas, Agricultural University of Athens, Laboratory of Plant Pathology, 75 Iera Odos, 118 55 Athens, Greece, Email: epaplom@aua.gr

The recent advent of molecular biology has contributed to the diagnosis of plant pathogenic fungi by offering new revolutionary methods for quicker and more accurate detection, identification and quantification. Although molecular diagnostics have been applied to fungi of diverse ecology, their application to pathogens of terrestrial ecosystems has been more striking due to the complexity of their environment over those of airborne nature. Several classical approaches differing in effectiveness had been developed over the years to detect and enumerate soil borne fungal pathogens. Selective growth on specially devised media aiming to exclude the vast majority of soil organisms and allow development of targeted

fungi was among the approaches most widely applied. However, dealing with soil fungi has always been a challenging issue because of the complex environment where these pathogens grow. In most cases, recovery on selective media was proved to be method dependent, the target organism was often outgrown by better competitors, morphological characters could be common for several species and bias of the researcher were factors that influenced the outcome of the results. Therefore, the application of molecular techniques to diagnostics of soilborne fungi was rather inevitable. Furthermore, DNA technology was expanded to the detection of fungal pathogens living in various environments i.e. inside plant tissues, on leaf surfaces, in seeds, in irrigation water but also bearing special features such as toxigenicity or resistance to chemicals. Additionally, protocols for molecular detection of quarantine fungi were devised and evaluated for various fungal pathogens. As initial molecular markers, isoenzymes and DNA probes were used to detect and differentiate various fungal species. Subsequently, molecular diagnostics based on the PCR technique have further accelerated the process and facilitate a more sensitive method of detection. Fungi can be identified at the species level by primers designed on selected conserved sequences like the rRNA gene cluster followed by further characterization of the amplified fragment. The rRNA gene cluster became very popular for a number of reasons; it has several hundred copies per genome and it carries highly conserved and variable regions. Sequences of the rRNA subunits have been used for taxonomic and genetic studies, while conserved regions of the internal transcribed spacers (ITS) and the intergenic spacers (IGS) have been targeted for fungal detection. PCR-based fingerprinting techniques (RAPDs, SSRs, AFLPs.) offering higher sensitivity and better resolution, have also been developed. Recently, DNA array technology (also known as biochip or DNA chip) aiming to monitor the whole genome on a single chip, has become available and applied to the molecular diagnosis of fungi. DNA chips are fabricated by high-speed robotics, generally on glass, on which probes with known specificity are hybridized to targeted complementary sequences. In this way, massively parallel gene detection is accomplished and many different microorganisms are identified. Experiments with a single DNA chip can result in a dramatic increase in throughput by providing information on thousands of genes simultaneously. This review presentation focuses on the application of various techniques for the molecular diagnostics of fungal pathogens. It is based on information found in the literature combined with personal research data of the author.

S 12

MOLECULAR DIAGNOSIS OF PLANT PATHOGENIC BACTERIA. Simon Weller, John Elphinstone, Neil Parkinson and Richard Thwaites, Central Science Laboratory, Sand Hutton, York, YO41 1LZ, UK, Email: s.weller@csl.gov.uk

Real-time, fluorogenic, PCR assays have recently shown great promise in the diagnosis of many plant pathogenic bacteria. In such assays repeated PCR cycles result in exponential amplification of the PCR product and a corresponding increase in fluorescence intensity, providing "real-time" analysis of the reaction kinetics and allowing quantification of specific DNA targets. As no post-PCR processing steps (such as gel electrophoresis) are required such assays also lend themselves to high throughput screening of samples. Assays that detect *Ralstonia solanacearum*, *Agrobacterium* spp., and *Xanthomonas fragariae* have been developed at CSL, and assays for *Clavibacter michiganensis* subsp. *sepedonicus* and *Erwinia amylovora* have been developed elsewhere. The key in the development of any test is the selection of an appropriate target DNA sequence and the development of a suitable DNA extraction protocol, directly from plant material. A real-time PCR assay (recently developed at CSL) which detects the strawberry angular leaf spot pathogen *Xanthomonas fragariae* (*Xf*) was designed using sequence data obtained from the housekeeping *gyraseB* gene. Although this gene is found in all bacteria, unique sequences were found for use as *Xf* specific PCR primers and probe, when compared to *gyraseB* sequence data obtained from closely related bacteria. In conjunction with a rapid and sensitive DNA extraction protocol this assay can detect the pathogen at 10^3 cells per reaction – a population level associated with latent infections by *Xanthomonas fragariae*.

S 13

MOLECULAR DIAGNOSIS OF PHYTOPLASMAS. Cristina Marzachi, Istituto di Virologia Vegetale, CNR, Strada delle Cacce, 73, I-10135 Torino, Italy, Email: c.marzachi@ivv.cnr.it

Phytoplasmas are non-culturable, wall-less and phloem-restricted pathogens transmitted in a persistent manner by leafhoppers and planthoppers (Homoptera: Auchenorrhyncha) and psyllids

(Homoptera: Sternorrhyncha). They are associated with diseases in many wild and cultivated plant species belonging to different families and cause economically important epidemics world-wide. The colonization of the plant by the phytoplasmas depends on the season, organ, host and pathogen species, and results in different symptoms due to complex interference with the host physiology. Sensitive and accurate diagnosis of these pathogens is crucial for the management of phytoplasma-associated diseases. Phytoplasmas are difficult to detect due to their low concentration especially in woody hosts and their erratic distribution in the infected plants. Their detection is now routinely done by nucleic acid-based techniques, mainly PCR. Total DNA preparations of good quality and enriched in phytoplasma DNA are usually obtained by including a time-consuming phytoplasma enrichment step, although simpler protocols have been developed using commercially available microspin columns. Successful phytoplasma detection in insect vectors may be attained with quicker total DNA extraction procedures, probably due to the high titre of the bacteria in the insect body. Universal phytoplasma-specific PCR primers have been identified in different positions of the ribosomal RNA operon, and group-specific primers have also been designed following comparison of the phytoplasma-specific 16SrRNA and 16S-23S intergenic regions of phytoplasmas belonging to different strain clusters. Ribosomal sequence-based primers are the most used for routine diagnosis of phytoplasmas. Universal and group-specific primers have also been targeted to other gene sequences, to sequences with no obvious predicted function and to the sequence of plasmids hosted by phytoplasmas. Routine diagnostic protocols usually involve the use of nested PCR. More recently phytoplasma diagnostic assays based on RT-PCR, real time PCR, PCR-ELISA, PCR-dot blot, heteroduplex mobility assay, 16S-23S spacer length polymorphism, microarray and nanobiotransducer hybridization have also been proposed.

S 14

MOLECULAR DIAGNOSIS OF PLANT VIRUSES. Khaled Makkouk and Safaa Kumari. International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria; Email: k.makkouk@cgiar.org

Proper virus identification is always the key in developing appropriate practical solutions to manage plant virus diseases. Recent advances in biotechnology and molecular biology have played a significant role in the development of rapid, specific and sensitive diagnostic tests. The use of ELISA, by employing either polyclonal or monoclonal antibodies, was a significant step in adding sensitivity and precision to virus detection. The development of the tissue-blot immunoassay (TBIA), as a variant of ELISA, greatly simplified testing, reduced the cost and permitted virus testing at locations where facilities are limited or even absent. Immuno Chromatographic Assay (ICA), is another ELISA variant which added speed to virus identification, where results can be obtained within 10-15 minutes, as compared to 2-3 hours for TBIA. However, ICA is more expensive than TBIA. The development of nucleic acid-based tools was another new dimension of virus detection. The most common among these techniques are cDNA hybridization and polymerase chain reaction (PCR). In addition, PCR can be used as a confirmatory test for TBIA, where processed blots can be cut individually and tested by PCR. This proved to work well with both DNA and RNA plant viruses. Furthermore, unprocessed plant tissue blots on nitrocellulose membrane represent a good sample for PCR amplification. PCR products can also be used for cloning and subsequent sequencing which is extremely useful for identification of new viruses or virus strains.

Economic Entomology

E 1

STUDYING THE FLYING ACTIVITY CURVE OF CODLING MOTH, *CYDIA POMONELLA*, USING PHEROMONE TRAPS, AND ITS RELATION TO WEATHER CONDITION. Jehan Alabdalla¹ and Wa'el Almatni². (1) Al-Swaida Research Centre, General Commission for Scientific Agricultural Research, As-Sweida, Syria, Email: jihan_na@hotmail.com; (2) Division of Pest Management, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, Email: almatni@scs-net.org

Pheromone traps of codling moth, *Cydia pomonella* L., were hanged in apple orchards at Al-Sweida Agricultural Research Center (Ain Al-Arab). Three pheromone traps were monitored every 2-3 days from early spring until few days before harvest during the period 2002 to 2006. The numbers of caught moths were recorded. Curves for the mean of the caught moths and date of catching were drawn for each year. There were full two generations and partial third generation in each year. The relation between cumulative temperatures above the reference' development threshold (10°C) and the caught moths was calculated. Moths started their emergence at 99.2±8 DD from the beginning of the year. 50% of moth flying occurred after 137±67.2 DD from the first catch, and the flying ended after 386.5±152.6 DD. Second flight began after 534.5±20.6 DD from the first-generation flight. Data from agricultural weather warning station could be then used effectively to improve future predicting programs for the development of the codling moth in orchards, especially beginning of moth flying of the first and second generation, using cumulative temperatures record from agricultural weather stations.

E 2

THE RELATION OF DIAPAUSE DATE OF CODLING MOTH, *CYDIA POMONELLA* L., WITH THEIR EMERGENCE DATE AND MOTH'S FERTILITY. Wa'el Almatni¹ and Jihan Alabdalla². (1) Division of Pest Management, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria. Email: almatni@scs-net.org; (2) Al-Swaida Research Centre, General Commission for Scientific Agricultural Research, Al-Sweida, Syria.

Diapaused larvae of codling moth, *Cydia pomonella* L., were collected from chemicals-untreated orchard in Sweida in 2002 and 2003. Larvae were collected weekly from the beginning of August until end of October. Those larvae were grouped based on the collection date. All were left in a protective cage in the orchard itself until the next spring. Emerged moths were kept in rearing cages: each date grouped together. It was found that the date when larvae entered to diapause had an effect on emergence date the following spring. Moths which emerged first were from first diapaused larvae. Moths from larvae that entered to diapause in August emerged 4-5 days earlier than those who entered diapause in September, which also were 5 days earlier than moths that their larvae diapaused in October. Fertility of moths that emerged from diapaused larvae were 17.2, 6.5, 12.5 egg/female in the seasons 2000/2001, 2001/2002 and 2002/2003, respectively. Moths that emerged from spring season larvae had an average fertility of 62 eggs/female. These results confirmed the effectiveness of diapause condition and diapause time on fertility of codling moths and their emergence date in the next spring.

E 3

BIOLOGY STUDY OF THE MEDITERRANEAN FRUIT FLY *CERATITIS CAPITATA* WIEDMANN, 1824 IN A TRADITIONAL AND MODERN WAY CULTURED OASIS USING TWO WARNING METHODS. Malik Laamari and Mustapha Slimane Bouasbana, Department of agronomy, Faculty of the Science, University of Batna, 05000, Batna, Algeria, Email: laamarimalik@yahoo.fr

The southern Algerian oasis is known for the diversity and density of plant cover which provides the Medfly all the favourable conditions for their development. The use of the pheromone traps permitted to assess 6 generations, capturing a maximum of 374.5 males per trap, per week. It also appeared that the traditional oasis covered by a high plant density of about 85%, presents a susceptible Medfly environment, which permitted to capture 3839 individuals. Whereas, in the modern oasis culture, characterized by a low plant density (57%), the number captured did not exceed 2630 individuals. The second technique based on monitoring temperatures is not useful for arid conditions.

E 4

IMPORTANCE OF HOST FRUITS AND SOME ENVIRONMENTAL FACTORS IN CODLING MOTH *CYDIA POMONELLA* L. POPULATION DYNAMICS AND ATTACK ON FRUITS. Ali Belouaer, Laboratoire de Protection des Végétaux, Institut National de la Recherche Agronomique de Tunisie, 49 Rue Hedi Karray, 2049 Ariana, Tunis, Tunisia, Email: belouaer.ali@iresa.agrinet.tn

In Tunisia, codling moth is a redoutable pest of pome fruits. Following heavy larvae attack, apple and pear fruits fall down. Damage is more serious when orchards are not well managed, where in portent yield loss and reduced quality can occur. Even in treated orchards, the incidence of attacked fruits can reach 93, 83 and 100% for apples, pears and quinces, respectively. This work aims at studying the interaction between codling moth and apple tree. It focuses on the very important role of the presence of fruits on the tree in relation to insect population dynamics, the extension of activity period, as well as the attack rate on fruits. This work also focused on the effect of some secondary factors on reducing the proportion of attacked fruits. Finally, the study examines wrong planting practices which favours the pest invasion and makes its control more difficult. Some recommendations for codling moth management to reduce obviate the insect damage will be proposed.

E 5

SURVEY OF INSECT AND MITE PESTS WHICH ATTACK PEAR TREES DURING THE BLOOMING AND FRUITING STAGES IN ISMAILIA GOVERNORATE IN EGYPT. M.A.M. Osman and F.M. Mahmoud, Plant Protection Department, Faculty of Agriculture, Suez Canal University, Ismailia, Egypt, Email: naeim70@hotmail.com, mfmfmousa@hotmail.com

The experiment was carried out for two seasons 2005 and 2006 at the two pear orchards of Suez Canal University, Ismailia Governorate, Egypt. The insect and mite pests associated with pear trees were surveyed during two successes blooming and fruiting seasons. For every pest the status, tome of occurrence and plant parts damaged were determined. Survey revealed presence of pests in 4 insect orders and one mite order. Mealybugs were the major pests in the first season, whereas in the second season *Cacopsylla pyricola* was the most important and occurred towards the end of May, and was not found in the previous season.

E 6

EFFECTS OF BIOSTIMULANTS AND KAOLIN PARTICLE FILM ON PEAR (*PYRUS COMNINUS* L.) RESISTANCE TO PEAR PSYLLA (*CACOPSYLLA PYRICOLA* FÖRSTER) INFESTATION. George Saour and Halah Ismail, AEC of Syria, P.O. Box 6091, Damascus, Syria, Email: gsaour@aec.org.sy.

Field experiment was conducted in summer 2005 on pear (*Pyrus communis* L.) at Sargahia Agricultural Research Station, northwest of Damascus to assess the effectiveness of biostimulant and kaolin-based particle film against pear psylla *Cacopsylla pyricola* Förster. Pear psylla nymph counts showed that populations were significantly reduced after the application of kaolin particle film compared to the control for up to 12 weeks. Kaolin particle film had the lowest counts of pear psylla adults over the entire sampling period. Biostimulant applications at 30 days intervals did not suppress pear psylla nymph and failed to maintain population size at low level during the experimental period. The spray of Envidor 240 SC, a new acaricide, suppressed pear psylla population and protected the treated trees from infestation. No phytotoxic effect on pear due to particle film application was detected. In contrast, kaolin-sprayed trees were healthier and more vigorous compared with the control treatments. Spraying pear with kaolin particle film seems to hold promise as an alternative pest management tool.

E 7

ECOLOGY OF THE BLACK LOUSE *PARLATORIA ZIZIPHI* ON CITRUS IN THE AREA OF BOUFARIK, ALGERIA. Mehdi Sellami and M. Biche, Department of Zoology, National Institute of Agronomy 16200, El-Harrach, Algiers, Algeria, Email: mergueb2002@yahoo.fr

The study of the citrus insect *Parlatoria ziziphi* (Homoptera: Diaspididae) was carried out in a citrus orchard in the area of Boufarik, in Mitidja, Algeria. The results obtained show that the black louse had four generations per year. The plant host and the climate influenced the distribution, evolution and also the mortality of the individuals of *Parlatoria ziziphi*. Among the biological stages, the adult larvae and males

are affected by the mortality conditioned by the climate. The adult females showed resistance to the outside conditions. The parasite *Aspidiophagus citrinus* had three generations, its activity is more visible through the adult females. Its parasitic activity on the black louse was observed to slow down with time.

E 8

THE RELATION OF MINERAL SALTS CONTENT IN FOLIAGE OF TWO CITRUS VARIETIES (LEMON AND CLEMENTINE) TO INVASION WITH *PARLATORIA ZIZIPHI* IN ALGERIA.

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The effect of chemical constituents of lemon and clementine tree on the invasion of *Parlatoria ziziphi* (Diaspididae: Homoptera) was investigated. The results showed that potassium, sodium and magnesium content in both varieties was inversely proportional to insect invasion, regardless of the leaves age. In addition, the results of mineral analysis showed that there was a larger amount of potassium in lemon tree than in the clementine tree, which was most infested. The fluctuation of copper and iron in both varieties in relation to invasion with *Parlatoria ziziphi* did not suggest a significant correlation.

E 9

POPULATION OF *PARLATORIA PERGANDII* COMSTOCK AND PARASITISM RATE ON THE DIFFERENT PARTS OF THE CITRUS TREE. Ahmad Rai¹, Kais Ghaza², Nabil Abo Kaf³ and Fedaa Shamseen⁴, (1) Lattakia, Agriculture Department of Lattakia; (2) Agriculture Department of Latakia; (3) Latakia Centre for Insectary and Reared Natural Enemies, P.O. Box 3100, Lattakia, Syria; (4) Tishreen University, P.O. Box 1446, Department of Tobacco in Latakia, Lattakia, Syria.

The population dynamics of the scale insect *Parlatoria pergandii* on the different parts of citrus tree was conducted in three locations in Lattakia during 2002/2003. The highest number of insects on fruit in location one (12.55 insect/fruit) reached in December and the lowest (0.45 insect/fruit) was in May 2002. The highest rate of parasitism on the fruit reached (9.83%) in March 2003 and the lowest (0%) in May, June and July 2002. In the second location, the highest number (24.25 insect/fruit) was in March 2003 and the lowest (2.28 insect/fruit) was in May 2002. The highest rate of parasitism on the fruit 7.95% reached in March 2003 and the lowest (0%) in May, June and July. In the third location the highest number (13.73 insect/fruit) was in October 2002 and the lowest (0.075 insect/fruit) was in May 2002. The highest rate of parasitism on fruit reached 16.98% in July 2002 and the lowest (0%) was in May and September 2002. The natural enemies on *P. pergandii* were *Aphytis* spp, *Encarsia* spp, and unknown parasitoid, and the predators were *Chilocorus bipustulatus* Linnaeus, and predator Cheletid mite which also predate its own eggs, but was rare.

E 10

ESTIMATION OF BIOLOGICAL PARAMETERS OF *PHYLLOCNISTIS CITRELLA* BY APPLYING LESLIE MODEL AND USING *POP TOOLS* PROGRAM.

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Phyllocnistis citrella Stainton is the most important pest which attacks citrus trees. The biological parameters were studied under laboratory conditions. A single female can lay from 6-79 eggs during its life, with an average of 42.7 eggs/female (Total fecundity), and lay 2-31 eggs per day, with an average of 7.12 eggs/female/day (Daily fecundity). The average reproductive rate (m_x) was 17.9 female/female. The next biological parameter was calculated after making a life table: The net reproductive rate was 15.14 female/female. The mean generation time (T) was 15.51 days, intrinsic rate of increase (r) was 0.174 female/female /Day; The Doubling time of Population (DT) was 3.98 days. *Phyllocnistis citrella* can give 11 generations or more per year. Leslie Model was used to obtain the expected increase in the density of *P. citrella* density during a limited period.

E 11

SURVEY OF CITRUS LEAFMINERS *PHYLLOCNISTIS CITRELLA* STANTON ON DIFFERENT VARIETIES OF CITRUS TREES IN LIBYA. Salem Shebli¹ and Haluma Kerra². (1) Agriculture Research Center, P.O. BOX 2480, Tripoly, Libya, Email: s_shebli@yahoo.com; (2) Plant Protection Department, Agriculture Faculty, Al-Fateh University, Tripoli, Libya, Email: Kerra50@hotmail.com

A study was conducted on the citrus leaf miner (*Phyllocnistis citrella*) (Lepidoptera: Gracillariidae) on citrus trees during the 2005 growing season in the western region of libya (Ain Zaras and Zawia) on the following varieties of orange trees *Citrus sinensis*: Succari (sweet), Hasna, Blood and Navel, in addition to lemon. It was found that the highest population of the insect was lemon trees. The rate of infestation in Ain Zaras and Zawia reached 99.0% and 96.7%, respectively on the new shoots in the autumn season. The lowest population was on Hasna variety, where the rate of infestation reached 20%. No differences in the infestation of the rest of citrus varieties were observed.

E 12

FLUCTUATION DENSITY OF CITRUS LEAF MINERS *PHYLLOCNISTIS CITRELLA* STANTON, AND ITS PARASITIDS IN THE MIDDLE OF IRAQ. M.S. Abdul- Rassoul¹, Amal N. Al-Khalidy², N.N. Hama² and Ameara, N. Hassan². (1) Iraq Natural History Museum, Baghdad University, Baghdad, Iraq; (2) National Centre of Integrated Pest Management, State Broad of Agriculture Research, Ministry of Agriculture, Baghdad, Iraq, Email: msabr_1942@yahoo.com

This study was carried out from October 2004 till October 2005 at the district of Al-Gryaat, by using citrus seedlings to determine the activity of citrus leaf miners *Phyllocnistis citrella* Stainton (Lepidoptera: Gracillariidae) and their associated parasitoids. The maximum density of the presence of insect larvae reached 256 per 100 leaves and declined till disappearance during the cold months, while the maximum density of the pupae reached 96 per 100 leaves during the second half of April. In addition, it was found that the insects had 11-12 generations a year. Two peaks of parasitoids population were found, the first one was during October (29 per 300 leaves at a ratio of 14.1%), while the second peak was during July (34 per 400 leaves at a ratio of 9.8%). The most dominant parasitoids found were *Ratzeburgiola incompleta* Boucek, *Cirrospillus* sp., *Neochrysocharis formosa* (Westwood), *Pnigalio* sp. and *Baryscapus* sp. at a parasitism rate 37.07, 27.59, 24.57, 5.17 and 5.60%, respectively, while the two species *Tetrastichus* sp. and *Pediobius* sp. were found in a very small number during the study. The field study showed that the parasites *Ratzeburgiola incompleta*, *Cirrospillus* sp., *Neochrysocharis formosa*, *Pnigalio* sp., *Baryscapus* sp., *Tetrastichus* sp. and *Pediobius* sp. were found at a parasitism rate of 52.94, 30.15, 6.62, 4.41, 4.41, 0.74 and 0.74%, respectively. The two parasites *Pediobius* sp. and *Baryscapus* sp. were recorded as citrus leaf miners parasitoids for the first time in Iraq.

E 13

ECOLOGICAL STUDIES ON THE OLIVE BUDS MOTH (JASMINE MOTH) *PALPITA UNIONALIS* HÜBNER AND ITS ASSOCIATED NATURAL ENEMIES IN SYRIA. Mahmoud Sabri Lababidi, Department of Plant Protection, Faculty of Agriculture, University of Aleppo, P.O. Box 12052, Aleppo, Syria, Email: mslababi@scs-net.org

In the last few years, a new olive insect pest that infests the buds and leaves was recorded and identified as the olive buds moth / or jasmine moth (*Palpita unionalis* Hübner) (Lepidoptera :Pyralidae). Within a short period of time, the pest became epidemic in olive nurseries throughout the country. Ecological studies were conducted, during 2003 and 2004, on the olive buds moth in two regions in Syria. The rate of infestation with the pest reached 100% in all regions but at different times; infestation of 100% was reached on September and August in Idleb and Aleppo, respectively. The pest occurred between the 1st week of May until the end of October with a peak abundance during the last week of September in Idleb and the 2nd week in Aleppo, respectively. Many beneficial insects and pathogens as natural enemies of *P. unionalis* were found, and recorded for the first time, in olive orchards and olive nurseries in Syria. The 1st and 2nd larva instars were attacked by a hymenopteran endoparasitoid *Dolichognida trachalus* (Nixon, 1965) (Lepidoptera: Braconidae). Rate of parasitism ranged from 5.6 to 85% in two regions under field conditions.

E 14

PRELIMINARY FIELD STUDY OF *EUZOPHERA PINGUIS* HAW IN SYRIAN OLIVE ORCHARDS. Ayman Barani¹, Nazer Hamdan², Raja Eaid², Ahmad albashi¹ and Hosam Abd Alwahab². (1) Department of Olive Research, Idlib, Syria; (2) Directorate of Agriculture in Damascus Countryside, Damascus, Syria, Email: muminad@scs-net.org

Olive ranks first among fruit trees in Syria, and olive production ranks third in economic importance, where the number of olive trees reached to more than 79 million trees, out of which 58 million trees produce one million tons olive fruits in 2004. In the autumn of 1999, olive plantations in Damascus countryside, suffered from a severe decline, which was accompanied by gradual dryness of the tree. Our study indicated that the phenomenon is due to an infection with *Euzophera pinguis* Ha, and this is the first record of this pest in Syria. The number of generations for this pest in Syria was three, whereas it was only two generations in different Mediterranean regions. A study was carried out to determine the distribution and characterization of this new pest.

E 15

BIOLOGICAL STUDIES ON THE OLIVE BUDS MOTH (JASMINE MOTH) *PALPITA UNIONALIS* HÜBNER IN SYRIA. Mahmoud Sabri Lababidi, Department of Plant Protection, Faculty of Agriculture, University of Aleppo, P.O. Box 12052, Aleppo, Syria, Email: mslababi@scs-net.org

In the last few years, the olive buds moth appeared as a serious pest in all olive nurseries in Syria, and in some new olive orchards in the costal region. Larvae of *Palpita unionalis* Hübner (Lepidoptera: Pyralidae) devour young leaves and apical buds causing stunted growth of olive plants. The aim of the present work is to study the biology of this insect under controlled and uncontrolled laboratory conditions of temperature and relative humidity. The incubation period of eggs of *P. unionalis* ranged between 2.9 days (at 30 °C) and 11.5 days (at 15 °C). The egg embryos died at 35°C. Larvae had 6 instars. The duration of the last instar was almost double the duration of the first. The shortest larval period (14.8 days) was at 30 °C. Larvae fed on leaves spinning several leaves together to form shelter for the pupa. At 20 °C, the mean duration of pupal stage was 18.2 days for males and 15.1 for females. The most favourable relative humidity for moth emergence was 65%. Copulation took place at mid-night, 24 hours after emergence, and lasted 65 minutes on the average. The total duration of the developmental stages at 25 °C were 29.5 days for males and 28.7 days for females. Under laboratory conditions (23.2 °C and 64.4% RH), the mean pre-oviposition period of fertilized females was 1.8 days, and the oviposition period was 11.3 days, and post-oviposition period was 1.5 days. The total number of eggs laid per fertilized female averaged 534 with a maximum of 570 eggs, the highest number being laid during the first day. Terminal rows of leaves were preferred by the moth for egg laying and more than 78% of the eggs were laid singly at twilight, usually on the lower surface of foliage. The longevity of moth was much affected by feeding but was slightly affected by mating. The sex ratio (female: male) was 1:1. Under laboratory conditions, 10 generations per year were recorded.

E 16

SOME ASPECTS OF THE BIOLOGY AND ECOLOGY OF FIG STEM BORER (FSB) *BATOCERA RUFOMACULA* DEGEER. Ibrahim Barakat El-Bakhiet, Awad Abdullah Elseeg and Yousuf Salim Al Mashikhi, Salalah Agricultural Research Station, Salalah 211, P.O Box 475, Sultanate of Oman, Email: bakh47@yahoo.com

A study was conducted under laboratory conditions during May-November 1998, when temperature ranged between 26-31°C and relative humidity of 60-80%. Duration of the different developmental stages of *Batocera rufomacula* DeGeer (Cerambycidae: Coleoptera) was determined and morphology was described. Pre-oviposition period, incubation period, larval and pupal period were 3.0, 6.4, 107.5 and 15.6 days, respectively. Fecundity was 274.3 eggs/ female, and there appeared to be one generation per annum. Results from surveys made during 1999-2001 showed that fig trees (wild and cultivated) were attacked by the *Batocera rufomacula*. In addition to figs, a number of plant species were also attacked including mango and avocado. The adult was observed to feed on the bark of the stem and main branches. The larva causes the greatest damage by penetrating the bark and later bore into the sapwood and remains inside until pupation

and adult emergence. As a result the tree is weakened and when infestation is severe trees succumb. The insect is nocturnal in habit and adults were observed to emerge during the period May-August.

E 17

ABOUT THE PRESENCE OF GREEN LEAFHOOPER IN VINEYARDS FOR WINE GRAPE AT HADJOUT AND BOURKIKA (MITIDJA), ALGERIA. F. Bounaceur¹, S. Ameer Laine¹ and A. Guendouz-Benrima². (1) Institut National Agronomique d'El Harrach, 16200, Algeria; (2) Institut d'Agronomie, Université de Blida, B.P 09, 09470, Soumaa, Blida, Algérie, Email: atiguen@yahoo.fr

Experiments were carried out in the area of Hadjoute and Bourkika located in Mitidja, Algeria, in a vineyard with four types of grape: Merlot, Cabernet Sauvignon, Syrah and Grenache. Five leaves were collected randomly from 10 vines. The number of green leafhopper larvae was counted on the lower leaf surface. Yellow traps were used to catch adults. An important infestation by the first generation was noticed at mid May but without damage. The second generation appeared in June with burnt marks on the leaves which are thereafter generalized during the summer period. The third generation appeared by the end of August. The Green Cicadelle develop 3 generations per year on vineyard in Mitidja as quoted by Professor Martin Vanhellden in Bordeaux

E 18

MONITORING THE CHANGES IN THE POPULATION ACTIVITY OF GRAPE BERRY MOTH, *LOBESIA BOTRANA* SCH., IN HOMS, SYRIA. Mohamed Ibrahim and Naufal Al-Radwan, Agricultural Scientific Research Station, Homs, P.O. Box 626, Syria, Email: gcsarhomcin@mail.sy

The changes in the weekly number of grapeberry moth (*Lobesia botrana* Sch.) in delta pheromone traps to estimate timing of male moths activity in grape vine yards was carried out during 2003 season in Homs Agricultural research Station. Results obtained indicated that this pest had three successive peaks. The population was relatively low from 4th week of May to 4th week of July. Then the numbers tended to increase gradually to reach the first peak on the third week of July (3 male moths/trap/week). The 2nd peak occurred during the 1st week of August (10 male moths/trap/week) and the 3rd peak with the highest number of captured moths occurred in pheromone traps during the 1st week of September to early October (20 male moths/trap/week). Results obtained revealed the presence of three Overlapping field generations during the 2003 season. The 1st generation from the 1st week of June to the 3rd week of July (7-8 weeks), the 2nd generation from the 3rd week of July to the 3rd week of August (5-6 weeks) and The 3rd generation: from the 2nd week of August to the 4th week of September (4-5 weeks). The damage-score for grape berry moth, *L. botrana* during 2003 season was 27.71%, and the rate of infestation to grape increased from the 1st week of August (31%) to reach a maximum by the 4th week of September (95%).

E 19

POPULATION DYNAMICS OF THE ACUMINATA SCALE (*KILIFIA ACUMINATA* SIGN.) ON MANGO TREES IN EGYPT. Al-Sayied A. Alwan, Plant Protection Research Institute, Agriculture Research Center, 7 Nady El-Saeid, Dokki, Giza 12311, Egypt, Email: ssechem@hotmail.com

Acuminata scale (*Kilifia acuminata*) (Homoptera: Coccidae) is an economic insect pest on mango trees in Egypt. The insect causes severe damage to the leaves by sucking the cell sap and excretes a large amount of honeydew that falls on the upper surfaces of the leaves and encourages the growth of sooty mould; the infested trees acquire a dirty black appearance. Population dynamics and effect of some weather factors on the insect activity were studied for two years (2004/2005) at the Horticulture Research Station in El-Qanater El-Khairia, Qalubya Governorate (40 km North Cairo). The results obtained showed that the insect has two overlapping generations per year under field conditions. The 1st generation occurred in spring with high numbers in April, whereas the 2nd generation occurred in autumn with high numbers in October/November. The insect population distributed randomly on the cardinal directions of the tree and concentrated with high numbers on the lower stratum of the tree, followed by the middle stratum, whereas the upper stratum harbored less numbers. Effect of the tested weather factors on the insect activity in both years revealed that daily mean minimum temperature had positive and highly significant effect, whereas daily mean maximum temperature had a negative and highly significant effect. Relative humidity had a positive effect on the insect activity in both years; insignificant in the 1st year and highly significant in the

2nd year. The combined effect of the tested three weather factors on the insect activity was highly significant and the amount of variability that could be attributed to the combined effect of these three factors on the insect populations was 58.7% and 67.9%, in the first and second year, respectively.

E 20

BIOLOGICAL STUDIES ON ACUMINATA SCALE (*KILIFIA ACUMINATA* SIGN.) IN EGYPT.
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Acuminata scale (*Kilifia acuminata*) (Homoptera: Coccidae) is an oviparous insect and reproduce parthenogenetically. The insect was reared successfully on small mango seedlings cultivated in black plastics sacs for one year (April, 2004 to April, 2005) under laboratory conditions. Results showed that the insect has three overlapping generations per year and the adult female passes through two nymphal instars before maturity. Duration of the nymphal instars varied in the three generations; the shortest period of the 1st instar nymph was 22.4±0.4 days at 24.1°C and 69.3% R.H and the longest period was 27.4±0.5 days at 16.8 °C and 78.1% R.H. In the 2nd instar nymph, the shortest duration was 28.1±0.5 days at 24.1 °C and 69.3% R.H. and the longest duration was 88.6±4.8 days at 16.8°C and 78.1 % R.H. The pre-oviposition period greatly varied in the three generations; the shortest period was 33.4±2.4 at 23.7°C and 78.4 %R.H and the longest period was 109.2±6.8 days at 13.7°C and 76.7% R.H. The shortest oviposition period was 61.3±3.6 days at 23°C and 78.5% R.H and the longest period was 102.9±18.4 days at 16.6°C and 77% R.H. The post-oviposition period varied, the shortest period was 6.9±1.9 days at 22.2°C and 71.4% R.H and prolonged to 53.5±12.1 days at 15.8°C and 77.1% R.H. The insect longevity varied in the three generations, the shortest period was 148.3±15.6 days and the longest period was 188.8±19.6 days. The fecundity of the insect also varied in the three generations, the highest mean number of crawlers /female was 95.8±3.9 and the lowest number was 54.9±2.3.

E 21

ENTOMOFAUNE OF THE PISTACHIO TREE (*PISTACIA*) IN THE PLAIN OF THE MITIDJA (ALGIERS). Salal Eddine Doumandji¹, Nadia Boukaroui¹ and Nadjiba Chebouti². (1) Department of agricultural and forest zoology, agronomic National institute, (2) Department of Biology, Faculty of Science, University of Boumerdes, Algeria, Email: chnadjiba@yahoo.fr

Before expanding the pistachio tree culture in Algeria, it was necessary to survey its principal pests. The current status of pistachio pests in Algeria is not known. A survey was carried out in an orchard planted with Aleppo pistachio (*Pistacia vera* L) and Atlas pistachio (*Pistacia atlantica* Desf.) during the September 2004 until September 2005. Results obtained indicated that the following species were present: *Gryllus burdigalensis*, *Grillus binaculatus*, *Ochrilidia tibialis*, *Acrida turrata*, *Ailopus strepens*, *Oedipoda caerulecens sulfurescens* pertaining to Orthoptera, and *Mantis religeusa* which belongs to the family Mantodea. Hymenoptera species identified in the same area of study were: *Cataglyphis bicolor*, *Messor Barbara*, *Pheidole pallidula*, *Pheidole* sp., *Monomorium* sp., *Tetramorium biskrensis*, *Apis mellifera*. Members of the family Bethyridae are predators of Coleoptera or Lepidoptera larvae. The order Coleoptera was the most common and was represented by the family Carabidae. In the family Curculionidae, *Apion* sp. and *Polydrosus* sp., in the family Staphylinidae, *Ocypus oleus*, *Ocypus* sp., in the family Tenebrionidae, *Blaps* sp., in the family Buprestidae, *Anthaxia viminalis* were identified. As for the order Diptera, was represented by the family Asilidae (*Asida* sp.), Drosophilidae, Calliphoridae and Jassidae. Homoptera was represented by the family Aphidae.

E 22

PESTS OF THE PISTACHIO TREE IN THE TELMECEN EASTERN STEPPE OF ALGERIA. Salah-Eddine Doumandji¹, Yahia Chebouti² and Nadjiba Chebouti-Meziou³. (1) Department of agricultural and forest zoology, agronomic National institute; (2) National Institute of Forest Research, Bainem, Algiers; (3) Department of Biology, Faculty of Science, University of Boumerdes, Algeria, Email: chNADJIBA@yahoo.fr

The culture of the pistachio tree (*Pistacia vera* L.) is very rare in Algeria. The economic and agronomic interest can expand the culture of this species in the country. Accordingly, a survey to identify

insect pest which attack pistachio trees in Algeria was carried out. The results obtained reveal the existence of five insect orders, Coleoptera with a frequency of 70 %, such as *Chaetoptelius vestitus* which digs galleries in young buds (the diameter of the gallery is 2.5 mm to 40 mm and the length is 4.81 mm to 18.12 mm), and *Mylabris oleae*, which consumes a considerable mass of the leaf area. Insects of the order Hymenoptera was present at a frequency of 10%, such as *Cataglyphis bicolor* and *Tetramorim biskrincis*. The dipterous insects were present at the rate of 5% (*Cyclorrapha* sp. and *Asidu lefranci*). Insects of the order Orthoptera were present at a frequency of 10%, such as *Sphingonotus Caeruleance* and *Anachridium aegyptium*. Insects species of the order Neuroptera were present at a frequency of 5%.

E 23

BIOLOGICAL STUDY OF CORN SAP BEETLE *CARPOPHILUS DIMIDIATUS* ON DATE FRUITS. M.Z. Najla and H.M. Kerra, Plant Protection Department, University of Al-Fatah. Tripoli, Libya, Email: najla_elzaidi@yahoo.ca

Biological studies on corn sap beetle *Carpophilus dimidiatus* (Coleoptera: Nitidulidae) was conducted under laboratory condition. The beetles were reared on semi dry date fruits, by using pairs of adult beetles (males and females) to determine the insect fertility. The life cycle of *Carpophilus dimidiatus* was studied under lab condition ($28\pm 0.5^{\circ}\text{C}$) and in an incubator at 25 and 30°C . Results showed that the mean number of eggs/female was 413 eggs, the pre-oviposition period was 3 days, oviposition period was 59 days, and the post-oviposition period was 9 days. The mean incubation period of the eggs was 3 days and larvae molted three times. The mean larval stage took 12 days, pupa 6 days, male longevity was 77 days, and female longevity was 71 days. Sex ratio was 1 male: 2 females. The life cycle from egg to adult under laboratory conditions ($28\pm 0.5^{\circ}\text{C}$) was 21 days while in the incubator at 25 and 30°C was 24 and 21 days, respectively.

E 24

MONITORING DATE PALM STALK BORERS *ORYCTES* SPP USING LIGHT TRAPS AND ITS RELATIONSHIP TO ENVIRONMENTAL FACTORS AT SEIYUN AREA IN WADI HADRAMOUT, YEMEN. Saeed A. Ba-Angood and Saleh O. Al- Baity, Department of Plant Protection, Nasir's College of Agriculture University of Aden, Yemen, Email: baangood@yemen.net.ye

Date palm stalk borers *Oryctes* spp are important date palm pests attacking date palm trees and causing a lot of losses in Wadi Hadramout. This research aims at monitoring the occurrence of the pest using modified Hjstand light traps that were installed during the period March 2003-February 2004 at Seiyun area in Wadi Hadramout; and studying the effect of some ecological factors that affect their occurrence in the area. The results have shown that the pest started to appear in light traps in the first week of March and reached their maximum number (188) in May 2003. The number decreased gradually in September, October and November; and in December, it completely disappeared. The pest started to appear again in January and February in low numbers with a mean number of 5 and 7, respectively. It has been shown that the pest has only one generation per year, and the sex ratio was 1.8: 1 females to males. There was no statistical significant difference (at 5% level) between the increase and decrease of the population of the pest that could be affected by the decrease or increase of temperature or relative humidity. The appearance of the moon had no relationship with the ability to trap the pest, as there was no significant difference (at 5% level) in numbers caught on moony or dark nights. It was concluded that light traps could be used successfully in monitoring the pest and reducing its number, and could also be used in any IPM program for the management of this pest.

E 25

SUSCEPTIBILITY OF DATE PALM CULTIVARS TO WHITE DATE SCALE *PARLATORIA BLANCHARDI* (TARG) IN WESTREN REGIONS OF LIBYA. Eman Jamahor¹, H.M. Kerra¹ and H. Maghrabi². (1) Plant Protection Department, College of Agriculture, El-Fatih University, Libya, Email: emanmb15@yahoo.com; (2) Zoology Department, College of Science; El-Fatih University, Libya.

Parlatoria blanchardi Targ, a white date palm scale insect is known to cause a great damage to date palm trees all over the world, affecting plant growth, fruit quality, and could lead to death of newly planted offshoots. The objective of the study was to determine the Susceptibility of date palm cultivars to *Parlatoria*

blancha (Targ) in western regions of Libya and study the population density. The study was conducted during May - November 2002. Eleven regions were surveyed (Zawia, Ben Gesheer, El-Swani, Janzore, Ain Zara, Tajora, Garaboly, Basis, Khoms, Zletin and Tawerga). Results indicated that all coastal cultivars (Bronsi, Taboni, Bekrari, Bayodi, Helawi, Hora, OM Hanash, Om Fteti, Om Adam, Elfarsha, Fezani, Najma) were found susceptible to infestation by *Parlatoria blanchardi*. The highest population density was recorded on Bekrari (5000 insects/10 leaflets), while infestation of the other cultivars varied (0-790 insect /10 leaflet), and no infestation on Saede cultivar was observed. In addition to white scale insect, *Parlatoria blanchardi* a green scale insect *Asterolecanium phoenicus* was also found in El-Swani on Bayudi cultivars only.

E 26

POPULATION DENSITY OF FRUIT STALK BORER *PHYLLOGNATUS EXCAVATUS* ON DATE PALM TREES IN EL-WAHAT, LIBYA. H.M. Kerra, A. Gaga and A. Hamza, Date Palm & Olive Development and Corporation, Karbouly, Libya, Email: kerra50@hotmail.com

A study was conducted in 2000/2001 to determine population density of *Phyllognatus excavatus* (Coleoptera: Scarabaeidae) in El-Wahat, Libya. Twelve light traps were distributed in three locations in El-Wahat (Ojela, Jallo and Ejker). Results showed that the fruit stalk borer *Phyllognatus excavatus* had one generation per year, and its population density reached 214 beetles in the first year and 323 beetles in the second year. The highest peak was reached in September in all studied locations, where it reached 87 beetles in 2000 and 111 beetles in the 2001. The beetles disappeared in December, January and February in both years. Results of this study support the role of light traps as a mechanical method to reduce & control the population of the fruit stalk borer and it can be used as a component of integrated pest management package in date palm orchards.

E 27

SURVEY AND DESCRIPTION OF FOREST STEM BORERS IN NORTHERN IRAQ. Batool A. Karso and Talal T. Mahmoud, Department of Forestry, College of Agriculture, University of Dohuk, Kurdistan Region, Iraq, Email: batool1220@yahoo.com

This study was carried out in north of Iraq (Kurdistan) during 2004 and 2005. The results indicated that there were many borer species which infested forest trees in Dohuk, Erbil, and Suleymaniya provinces. Taxonomically, identified beetles belong to the family Buprestidae. The larvae of this species are known as flathead borers, and cause serious damage to the plant usually excavating inside the trunk S - shaped. There Another borer *P. tabaniformis* Rott. (family: Aegeriidae) was identified The eggs hatched and the larvae penetrate the stem and dig a tunnel under the bark and deepened in the wood, to make circularly tunnels and produce a gall-like structure in the tissue invaded by the larvae. This causes large amounts of sap mixed with frass oozing out from entrance holes on the trunk. Borer species collected from the poplar planting and natural forests in Kurdistan region (from Zakho to Sulaimani) and described.

E 28

THE MAIN PESTS OF OAK CORK TREES AND THEIR IMPACT ON THE QUALITY OF CORK. Rashid T. Bouhraoua, Faculty of Sciences, Tlemcen University, B.P. 119, Amama, 13000 Tlemcen, Algeria, Email: rtbouhraoua@yahoo.fr

The oak cork tree is economically important in Algeria, and the cork it produces is used for several purposes. Cork production in Algeria is declining because of the reduction of the area planted and the deterioration of the health of the trees. The reasons are many and include drought, absence of silviculture, frequent fires, overgrazing, diseases, insects and poor forest management. A study in some forests in the Algerian west enabled the identification of 20 species of wood-boring insects belonging to the family Cerambycidae. The level of infestation of these species is higher at the littoral areas which face dryer climatic conditions. The population of some species such as *Platypus cylindrus* reached high levels which is responsible for 8% trees of mortality. The two other species *Stromotium fluvum* and *Lichenophanes numida* reduced the quality of the cork.

E 29

SURVEY OF COFFEE INSECTS UNDER TRADITIONAL STORAGE CONDITIONS IN YEMEN. Hassan Soliman Ahmed Mahdi, Plant Protection Department, Faculty of Agriculture, Sana'a University, P. O. Box 14430 Sana'a, Yemen, Email: hsamahdi@yahoo.com

A survey for stored coffee bean insects was carried out during the period April to July 2004, to identify insect species in Yemen. Four locations in Sana'a were visited, namely Babb Al-Yemen (Sauk Al-Mullah), Math bah, Al-Safia (Al-Bolali neighborhood) and Al-Kuwait neighborhood. Around 22 samples of stored coffee beans were collected, 6 of naked stored coffee beans (without hulls and prepared for grinding) one of them was imported from Ethiopia, 12 of whole stored coffee beans (with hulls), 2 of coffee bean hulls called Qisher in Yemen, and 2 samples of debris. In this survey, 7 species of insects from different families were identified. Flour beetle (*Tribolium castaneum* Herbst) and confused flour beetle (*Tribolium confusum* Duval), family Tenebrionidae, were found on damaged coffee beans and debris. One specie, the saw-toothed beetle (*Oryzaephilus surinamensis* (L.)), family Silvanidae, was found on damaged coffee beans and debris. Another specie, Lesser bean borer (*Rhizopertha dominica* (F.)), family Bostrichidae, was found on debris only. A third specie, the chine's cowpea beetle (*Callosobruchus chinensis* L.), family Bruchidae, was found on debris. Results showed that dead adults of the coffee berry borer, *Stephanoderes hampei* (Ferr.), family Scolytidae, was found inside coffee beans imported from Ethiopia, and this is the first report of the coffee berry borer in coffee stores in Yemen. Results showed that all samples of stored coffee grains were infested with coffee berry moth *Prophantis smaragdina* (Butler) (Pyrilidae: Lepidoptera) in the field. The identification of insects in collected samples of stored coffee beans from other locations will continue in the future.

E 30

BIODIVERSITY OF INSECT FAUNA IN YEMEN. A.M.A. Sallam and S.A.Ba-Angood, Department of Plant Protection, Nasir's College of Agriculture, University of Aden, P.O. box 2106 Sheikh Othman, Aden, Yemen, Email: amasallam2005@yahoo.com

The Republic of Yemen is characterized by a good diverse plant cover in some regions, which renders it of special importance in biodiversity. The identified insect species in Yemen reached more than 4000 species, which belong to 1346 Genera, 335 Families and 27 Orders. Out of these, 98 species were identified recently, and are new to science. In addition, 403 species were recorded for the first time. It is expected that this number would be doubled in the coming 10 years. This insect list includes 350 species that cause economic damage to field crops, fruit and forestry trees, stored products, as well as domestic animals and human beings. The list also includes 180 beneficial species (parasites, predators, honeybeesetc) that need conservation. The paper also refer to some secondary pests that reached the status of primary pests in recent years, and mentioned non-chemical control alternatives that could be used for the management of these pests in Yemeni agriculture.

E 31

SPATIAL DISTRIBUTION AND SAMPLING METHODOLOGY OF THE WHITEFLY, *BEMISIA TABACI* STAGES ON CUCUMBER PLANTS. Abd El-Ghany M. El-Sayed¹, G.K. Erain² and Abba F. Abdul Salam¹. (1) Plant Protection Research Institute, Dokki, Egypt; (2) College for Arts, Science and Education, Ain Shams University, Cairo, Egypt, E-mail: dr_homam@hotmail.com.

Distribution pattern of *Bemisia tabaci* (Gennadius) (Aleyrodidae: Homoptera-Hemiptera) were studied on cucumber varieties (Madin, Sweet crunch and Amera). Results showed significant differenced among infestation to leaves on the main stem. The greatest number of adult's, eggs, larvae and pupae were recorded on the leaves at the main stem nodes 4-6, 8-10 and 9-11, respectively. This study suggested that when sampling leaves of cucumber plants in the field only ten leaves from 10 plants are enough to be collected from each plot (1/50 feddan), from the main stem nodes 4-6 for adults, 8-10 for eggs and 9-11 for larvae and pupae to make the best assessment of whitefly stages in cucumber plants. Based on Taylor's Power Law, results indicated that patchiness regressions of each stage of whitefly were aggregated, but there were distinct degrees of aggregation between main stem nodes.

E 32

STUDY THE EFFECT OF IRRIGATION STRESS ON POPULATION DENSITY OF COTTON WHITEFLY (*BEMISIA TABACI*) IN VARAMIN AREA, IRAN. Sayyedah Masoumeh Hasheminia, Faculty member of Islamic Azad University, Roudehen Branch, Iran, Email: angelarmita@yahoo.com

Cotton whitefly is one of the important pests in most cotton growing areas of Iran and in the world that reduces the quality of cotton. Proper time and optimum water use decrease cotton whitefly population. In order to determine the effect of water stress on cotton whitefly population density, an experiment was conducted in 2005 in Varamin area. The experimental design was split-split plot with three replicates and two irrigation intervals, 7 and 14 days at 50% and 100% of water requirement. Results in Varamin showed that, irrigation frequencies of 7 days increased yield to 71.3% than frequencies of 14 days and decreased whitefly population (egg, nymph and adult insect). The reduction of water requirement from 100% to 50% decreased whitefly population and also yields by 11%. The yield of Varamin variety was 34.5% more than the yield of Sahel variety.

E 33

POPULATION DYNAMICS OF CUCURBIT FLY, *DACUS CILIATUS* LOEW ON ZUCCHINI PLANTS IN RIYADH AREA, KINGDOM OF SAUDI ARABIA. Abdulrahman Saad Aldawood, Department of Plant Protection, College of Food and Agricultural Sciences, King Saud University, P.O. Box 2460, Riyadh 11450, Saudi Arabia, Email: aldawood@ksu.edu.sa

Population dynamics of Cucurbit fly, *Dacus ciliatus* Loew (Diptera: Tephritidae), on two zucchini varieties (local and Hybrid) at two locations in Riyadh region (Huraymela and Dirab) during 2003 growing season was studied. The objective was to find out the appropriate timing of applying control measures towards controlling this pest. Cucurbit fly causes great damage to zucchini fruits that renders the marketing of this crop difficult due to damage caused by egg laying and fruit rot. This study showed that there were two peaks of activity, one at the beginning of May and the second at the beginning of June, in both locations. Infestation rate fluctuated between 4% and 71%. When comparing these two locations, it was shown that number of infected fruits and rate of infestation were higher in Huraymela compared to Dirab location, where numbers of infected fruits were 50.2 and 20.3 and rate of infestation were 35.1% and 19.6%, respectively. There were no significant differences in the rate of infestation between the varieties. Results showed that zucchini plants were best grown in Huraymela location due to the favorable weather conditions that reflected in higher yield, and planting the hybrid variety was advised. The recommended time of applying control measures immediately before the occurrence of the two peaks, in early May and early June.

E 34

RECENT STATUS OF WHITEFLY SPECIES IN YEMEN WITH SPECIAL REFERENCE TO *BEMISIA TABACI* (GENNADIUS) POPULATIONS COLLECTED FROM DIFFERENT LOCATIONS. N.M.M. Abdullah¹, Jon Martin² and Judith K. Brown³. (1) Department of Plant Protection, Sana'a University, P.O. Box 13609, Main Post Office, Sana'a, Yemen, Email: abd_nasher@yahoo.co.in; (2) Department of Entomology, The Natural History Museum, Cromwell Road, London SW7 5BD, UK, Email: j.martin@nhm.ac.uk; (3) Department of Plant Sciences, The University of Arizona, Tucson, AZ 85721, USA, Email: jbrown@ag.arizona.edu

Although more than 1500 species of whiteflies have been identified worldwide, only three have hitherto been recorded in Yemen: *Aleurocanthus woglumi* (Ashby), *Bemisia tabaci* (Gennadius), and *Dialeurodes citri* (Ashmead). Here we report the identification of three additional whitefly species from Yemen, namely, *Acaudaleyrodes rachipora* (Singh), *Neomaskellia bergii* (Signoret) and *Singhiella elbaensis* (Priesner & Hosny). In addition, *B. tabaci* has long been known as a major pest and virus vector in Yemen, causing economic damage, due to feeding and its ability to transmit begomoviruses. Begomoviruses are emerging plant viruses that cause serious diseases in a number of important crops, like tomato, pepper and watermelon which are widely consumed as a source of vitamin C. To assess the genetic variability of *B. tabaci* in Yemen, populations were collected from several low and high desert habitats and subjected to molecular analysis using the mitochondria cytochrome oxidase I gene (mtCOI) as a molecular marker. Polymerase chain reaction (PCR) amplification of the mtCOI, followed by DNA sequencing, and

phylogenetic analysis indicated that at least three distinct haplotypes were represented. Among these, only the B biotype had been previously documented in Yemen. The other two haplotypes are thought to represent local or indigenous *B. tabaci*. A distinct haplotype was found exclusively in the mountainous high desert habitat, while the other predominated in the west coastal and southern highlands of the country. At times, the latter haplotype was found mixed with the B biotype. The differences in the two topographies and associated climatic variability may play a major role in establishing barriers between the two (putative) indigenous haplotypes. That the B and the native lowland haplotype occurred as a mixed population on some of the same plant hosts suggests that the B biotype may not be native to Yemen, and further that the two may not be reproductively compatible. Comparative studies, including mating compatibility, endosymbiont composition, and begomovirus-vector competency is required to better understand the biological differences between the native lowland haplotype and the B biotype, and between these newly discovered native lowland desert and mountainous, highland desert haplotypes.

E 35

SURVEY OF *BEMISIA TABACI* (GENNADIUS) (HOMOPTERA: ALEYRODIDAE) BIOTYPES IN JORDAN USING RAPD MARKER. Hazem S. Hasan, Department of Agricultural Technology, Agricultural Tchnology Collage, Al-Balqa Applied University, 19117 Salt, Jordan, Email: hazem@bau.edu.jo

Random amplified polymorphic DNA polymerase chain reaction (RAPD-PCR) was used to survey the B biotype and other biotypes of *Bemisia tabaci* in Jordan. A total of 123 whiteflies were collected from cultivated plants, wild plants and weeds from 9 different localities and on 12 distinct crops. RAPD analyses using three selected 10-mer primers reliably identified *B. tabaci* biotypes. The total number of clear bands obtained from it was 29 DNA bands. Cluster analysis demonstrated that, in general, biotype B individuals which are scattered independently in the localities according to the host plant and coexists with cultivated plants. While an intermediate whitefly populations BA having biotype A a distinguish band only with OPR-04 but according to Jaccard similarity they have higher genetic distance with biotype B and these samples where restricted to wild plants and weeds. And finally the biotype A was restricted to the isolated area compared to other biotypes. The occurrence of Whitefly biotype A, B and BA in the sample was approximately 12.5, 75 and 12.5%, respectively, in the Jordan Valley and Upland tested samples.

E 36

EFFECT OF WEED AND WHITEFLY MANAGEMENT IN CUCUMBER FIELDS ON WHITEFLY INFESTATION IN NEIGHBOURING COTTON FIELDS. M. I. Shedeed, S. M. Hassan and H. B. Homam. Plant Protection Research Institute, Nadi El-Said Street, Dokki, Giza 12618, Egypt, Email: dr_homam@hotmail.com

Cotton whitefly *Bemisia tabaci* (Genn.) can be managed in cucumber fields by hand hoeing of weeds two times during the season and spraying of chloropyrifosmethyl (Reldan 50% EC), pirimiphos-methyl (Actellic 50% EC), or mineral oil such as Caple-2, botanical oil such as Jojoba oil or neem seed extract or by using Caple-2+ micronized sulpher. The effect of *B. tabaci* and weeds management was monitored by counting the cotton white flies, which causes the infestation of neighboring cotton fields. The investigations were conducted at Monofeia Governorate during 2002 and 2003 cotton seasons. The results obtained indicated that weed management and spray with the insecticide, Actellic 50% EC or mineral oil, Caple-2 +micronized sulpher in cucumber fields had significant effect on reduction of *B. tabaci* infestation in cotton fields. In an attempt to replace the highly toxic chemical compounds by less toxic ones, the combination of mechanical control (hand hoeing) with mineral oil + micronized sulpher gave promising results.

E 37

DIRECT AND INDIRECT EFFECT OF SPINY BOLLWORM *EARIAS INSULANA* BOISD. ON COTTON BOLLS FORMED AFTER THE FIRST PICKING. Suaad Irdeny Abdullah, Plant Protection Department, College of Agriculture and Forestry, University of Mosul, Mosul, Iraq, Email: suaad53irdeny@yahoo.com

The results of direct and indirect effect of spiny bollworm *Earias insulana* Boisd. on ten varieties of cotton (Sp8886, Ashur, Montana, Dun1517, Dun 325, Dun1047, Astonofel 887, Delta Bin 50, Lashata and Cocker 310) on the cotton bolls formed after the first picking, indicated that the larvae prefer the bolls of the size ranging from 10-15 cm³, followed by the bolls of the size ranging from 16-20 cm³. The largest number of holes was found in the second week of October, with an average of 273 holes (16, 54, and 203 on the high, medium and low levels, respectively). The number of the living larvae and the dead carpel's was increased at the same period mentioned above with an average of 70 larvae and 240 carpels, respectively. On the other hand, the rate of dead seed reached 28% in Astonofel 887. This high rate was accompanied with an increase in the percentage of larvae holes and the boll rot that reached 77 and 92%, respectively.

E 38

THRESHOLD TEMPERATURES AND THERMAL REQUIREMENTS OF THE LESSER COTTON LEAFWORM *SPODOPTERA EXIGUA* HB. Hassan F. Dahi and S.M. Abdel-Khalek, Plant Protection Research Institute, Agriculture Research Center (ARC), 7 Nadi El-Said Street, Dokki, Giza, Egypt, Email: hassandahi@yaho.com

The effect of three constant temperatures (20, 25 and 30°C) on the lesser cotton leafworm (*Spodoptera exigua*) (Noctuidae: Lepidoptera) growth and development was studied. The egg incubation period, length of larval, pupal, pre-oviposition stages and duration of generation time were assessed. The time required for the different developmental stages decreased as the temperature increased from 20 to 30°C. The threshold temperatures were 13.15, 9.64, 11.07, 9.64 and 10.67 °C for egg incubation, larvae, pupae, pre-oviposition stages and adults, respectively. The average thermal requirements needed for completing growth and development were 36.0, 196.1, 111.29, 29.06 and 368.3 degree-days for the above mentioned five stages, respectively.

E 39

EFFECT OF SOME SOIL FERTILIZERS AND INORGANIC SALTS AGAINST LARVAL AND PUPAL STAGES OF COTTON LEAFWORM, *SPODOPTERA LITTORALIS* (BOISD.). S.A. Mohamed¹, H.F. Dahi¹ and A.G. El-Sisis². (1) Plant Protection Research Institute, Agriculture Research Center (ARC), 7 Nadi El-Seid Street, Dokki, Giza, Egypt; (2) Pesticide Central Laboratory, ARC, Dokki, Giza, Egypt, Email: hassandahi@yaho.com

Two different experiments were conducted to evaluate the toxicity of soil fertilizers (ammonium sulfate, potassium sulfate and super phosphate) and two inorganic salts (ammonium oxalate and potassium bromate) against the larval stage of the cotton leafworm infesting vegetative growth of cotton plants and the pupal stage present in the soil. Results obtained of testing the above compounds at 2.0, 1.0 and 0.5% dilutions on cotton plants against the larval stage indicated that all showed low initial toxic effect but they showed latent toxic effect, as the death of the larvae increased as time after treatment with continuous feeding with treated leaves increased. Potassium bromate showed the highest effect followed by potassium oxalate and super phosphate since they gave the lowest rate of emerging pupae. On the other hand, results indicated that super phosphate was the highest toxic material against pupal stage (63.3 mortality %) followed by potassium bromate (56.1 mortality %) potassium sulfate and ammonium oxalate, whereas ammonium sulfate showed the lowest toxic effect. Moreover, malformation, fecundity, moth emergence and egg hatchability rate were recorded. Results indicated that all treatments caused reduction in both fecundity and fertility. Potassium bromate was the best material to reduce the number of egg /female, followed by super phosphate and potassium sulfate as compared with untreated one. It could be concluded that the tested material played two roles; nutrient for cotton and a pesticide to cotton leafworm.

E 40

INCIDENCE AND DAMAGE CAUSED BY THE AFRICAN BOLLWORM, *HELICOVERA ARMIGERA* (HUB.) IN THE FIELD IN GEZIRA AND RAHAD SCHEMES IN SUDAN. El Nayer Hamid Suliman, Crop Protection, Agricultural Research Corporation, Entomology Research Section, P. O. Box 126, Wad Medani, Sudan, Email: elnayer15@yahoo.com

The first appearance of *Helicoverpa amigera* in the field was recorded on 15/8 and 19/8/1997 in the Rahad and Gezira Research Station farms, respectively. In both sites the pest was first recorded on weeds such as Tabar, *Ipomea cordofana* Choisy; Ibreg Elfaki, *Commelina kostchyi* Hassk and on groundnuts, *Arachis hypogea*. The pest invaded sorghum on 12 and 13/9/1997 in the Gezira and Rahad sites, respectively. Two annual generation of the pest were recorded during the season. The first or second generation in both sites took the same period to develop i.e. 28 days. The larvae of the first generation continued in the field until 10 and 11 October, 1997 in the Gezira and Rahad, respectively, while those of the second generation disappeared from the field of respective sites on 13 and 18 November, 1997. In both sites the peak of infestation by first generation larvae was recorded on 19 and 27 September, 1997 (mean of 5.6 and 6.45 eggs and /or larvae/100 plants, respectively) and during October 1997 (13.3 and 6.6 eggs and/or larvae /100 plants, respectively).

E 41

BIOLOGICAL STUDY ON LEAF MINER *LIRIOMYZA HUIDOBRENSIS* (BLANCHARD). Rasmia Al-Muallem, General Commission of scientific Agricultural Research, Damascus, Douma, P.O. Box: 113, Damascus, Syria, Email: arasmia@scs-net.org

Liriomyza huidobrensis (Diptera: Agromyzidae) is the most widely distributed species of leafminers in protected cultures and open fields in Syria. It attacks various species of vegetables, field crops and ornamentals causing serious damages especially in greenhouses. Life cycle and development were studied at constant temperatures on cucumber (*Cucumis sativus* L. var. Toshka). Total development time was 65.6, 26.6 and 18.1 days at 4, 22 and 28°C, respectively. Egg development took 16.3, 5.4 and 3.6 days, larval development lasted 20.3, 8.4 and 7 days, whereas development of pupae required 29.1, 12.7 and 8.2 days at the above mentioned temperatures, respectively. The temperature threshold for eggs was 10.6 °C, for larvae 7.1 °C and 10 °C for Pupae. The effect of host plant on the developmental time was studied at 14 and 28 °C. Development time on broad beans (*Vicia faba* L.) was significantly shorter than the development time on cucumber at both temperatures. It took 48 and 16 days on broad beans, whereas it took 66 and 18 days, at 14 and 28 °C, respectively. Host preference was studied using cucumber and broad beans. *L. huidobrensis* significantly preferred broad beans for feeding and oviposition. The average number of feeding and oviposition punctures/ plant was 49.7 and 386.9, and the average number of pupae/plant was 10.8 and 251 on cucumber and broad beans, respectively.

E 42

YIELD LOSS CAUSED BY THE CHICKPEA LEAF MINER, *LIRIOMYZA CICERINA* ROND. Soha Khoja¹, M. El Bouhssini², N. Kagka³ and A. Joubi². (1) General Commission for Scientific Agricultural Research, Aleppo, Research Center, Aleppo, Syria; (2) International Center for Agricultural Research in the Dry Areas (ICARDA), Aleppo, Syria; (3) College of Agriculture, the University of Aleppo, Aleppo, Syria.

Leaf miner, *Liriomyza cecерina* Rond., is an important insect pest of chickpea in North Africa and West Asia. The present study was conducted at Tel Hadya, ICARDA's experimental station, to quantify yield losses caused by this insect. Two resistant cultivars (ILC 5901 and ILC 3800), one susceptible cultivar (ILC3397) and the local cultivar (ILC1929) were used in this study. The experiment was conducted using a factorial combination of spray treatments (treated vs untreated) and varieties in a randomized complete block design with four replications during 2001/2002 and 2002/2003 cropping seasons. In 2001/2002, the percent leaflet damage at the vegetative stage was lowest (9.1%) on the resistant cultivar ILC5901 compared to the susceptible check (23.7%). At the reproductive stage, the resistant cultivar ILC3800 had the lowest leaflet damage (10.3%) compared to the susceptible one with 70.8%. The percent yield loss was significantly lower in the two resistant cultivars compared to the susceptible, and this was respectively 11.8, 13.9 and 33% for ILC3800, ILC5901 and ILC3397. The 2002/2003 results were similar to those of the 2002. The results of this study confirmed that the leaf miner is an important pest of chickpea. It also showed that

the deployment of chickpea cultivars resistant to leaf miner would contribute significantly to the reduction of damage caused by this pest.

E 43

EFFECT OF PLANTING DATES AND INSECTICIDES APPLICATION ON THE INFESTATION BY *ETIELLA ZINCKENELLA* T. ON SOYBEAN, AND A SURVEY OF ITS PARASITES. Khaled Mohamed Mardini¹, Hisni Abu Khaled¹ and Soha Khoja¹. (1) General Commission for Scientific Agricultural Research, Scientific Agricultural Research Center, Aleppo, Syria, Email: kmardini62@hotmail.com.

The larvae of *Etiella zinckenella* T. (Lepidoptera: Pyralidae) attack soybean plants and cause serious yield loss. Results of the first season differences in the infestation level; 9.2% for the first planting (6 June), 13.8% for the second planting date (5 July), and 15.8% for the third planting date (20 July). Results of insecticides' application indicated that deltamethrin and methyl alparathion reduced infestation in the first planting date to 4.85 and 6.47%, respectively. Results of the second season indicated that infestation was 9.5% for the first planting date, 22.4% for the second planting date, and 46.8% for the third planting date. Results of insecticides' application with deltamethrin and methyl parathion showed that infestation in the first planting date reached 8.6 and 10.4%, respectively. Grain yield reached 2484 kg/ha in the first planting date, 2048 kg/ha in the second planting date, and 1086 kg/ha in the third planting date. Insecticides' application with deltamethrin and methyl parathion increased yield to 2549 and 2488 kg/ha, respectively. Results of the second season were similar to those of the first one. Three parasitoids was found to attack *E. zinckenella* in Tal Hadya area: *Bracon* sp. (Hymenoptera, Braconidae), *Eurytoma* sp. (Hymenoptera, Eurytomidae) and *Cytoptyx* sp. (Hymenoptera, Pteromalidae).

E 44

POPULATION DYNAMICS OF *APHIS FABAE* ON BROAD BEAN AND SURVEY OF ITS NATURAL ENEMIES IN THE COUNTRYSIDE OF DAMASCUS, SYRIA. Loulou Al Bittar¹, Nabil Abou Kaf² and Ziad Chek Khamees³. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Douma, P.O. Box 113, Damascus, Syria, Email: louloual@maktoob.com; (2) Plant Protection Department, Faculty of Agriculture, University of Tishreen, Lattakia, Syria; (3) Plant Protection Department, Faculty of Agriculture, University of Albaath, Homs, Syria.

A field study conducted during the season 2004-2005 in the countryside of Damascus to study the dynamics of *Aphis fabae* on broad bean according to change of meteorological conditions and the population of natural enemies (syrphid flies and ladybird beetle). The Design of experiments was completely randomized, 30 plants were randomly chosen to count the aphids (alate and non alate) and their natural enemies, and also to count the rate of infestation and population density causing injury according to Geibler scale. The first appearance of aphis 2 alates on March/12/2005 with injury level of 3.33%, then this level reached 100% on May 9, 2005 accompanied with a peak number of *Aphis* sp. The appearance of natural enemies was noticed in low numbers at the beginning of colony establishment. Later on, this number slowly increased to reach a peak in middle of April for the ladybird beetles and in early May for the syrphid flies. Five species of ladybird beetles were found: *Coccinella Septempunctata*, *C. undecimpunctata*, *Adalia decimpunctata*, *Propylaea quaterdecimpunctata* and *C. bipunctata*. In addition, two unidentified species were identified and *C. undecimpunctata* was the most common species. The correlation of aphis number (alate and non alate) with temperatures (lady bird beetles) was low and ($r = 0.476$) and not significant. While the correlation with syrphid flies was medium significant ($r = 0.68$), and the correlation was strong and significant with the level of injury ($r = 0.941$). The correlation of natural enemies (ladybird beetles and syrphid flies) with temperatures was strong and significant ($r = 0.73$).

E 45

DETERMINATION OF RESISTANCE OF EXPERIMENTAL SOYBEANS TO THE LIMA BEAN POD BORER *ETIELLA ZINCKENELLA* TREITSCHKE AND THE WHITEFLY *BEMISIA TABACI* GENNADIUS AT DAKHLA OASIS, NEW VALLEY, EGYPT. Mohamed A. Amro¹, Mahmoud S. Omar¹ and Abdellah S. Abdel-Moniem². (1) Plant Protection Research Institute, Agricultural Research Center, Dokki, Egypt; (2) Department of Pests and Plant Protection, National Research Center, Dokki, Egypt, Email: a7med_3mr@yahoo.com

Three soybean varieties and two cultivars have been planted in an isolated and closed agro-desert ecosystem in El-Dakhla Oases, New Valley Governorate. The resistance of the selected soybeans against the lima bean pod borer *Etiella zinckenella* (Lepidoptera: Pyralidae) and the whitefly *Bemisia tabaci* (Homoptera: Aleyrodidae) was evaluated. The results obtained indicated that the tested soybean varieties Clark, Giza 22 and Tono had a higher infestation rate by *E. zinckenella* with an average of 4.30, 3.54 and 9.13%, respectively. Similar results were obtained by calculating the rate of damaged soybean seeds. The highest damage rate appeared on Tono variety (9.30%), while the lowest on Hagen 32 cultivar (1.97%). High compatibility was recorded between the resistance status of the tested soybeans and the mean numbers of *E. zinckenella* individuals attacking the developing pods. The newly produced cultivars Hagen 32 and S5 appeared as moderately resistant cultivars. However, the soybean varieties Clark, Giza 22 and Tono were resistant, susceptible and highly susceptible varieties, respectively. Results obtained indicated a distinct compatibility between the nymphal infestation rate of *B. tabaci* and the level of resistance. Although, the tested soybeans exhibited different degrees of resistance, the newly developed cultivar S5 was found resistant to *B. tabaci* infestation. Consequently, plant breeders can use these resistant cvs in their crossing program.

E 46

THE EFFECT OF TEMPERATURE ON SOME BIOLOGICAL TRAITS OF THE SOUTHERN COWPEA WEEVIL *CALLOSOBRUCHUS MACULATUS* (F.). Khadija Suliman Mahmood¹ and Tariq Mohamood Salih². (1) Biology Department, Faculty of Science and Arts, Al-Tahady University, Hoon, Libya, Email: khadjas@yahoo.com; (2) Biology Department, Science College, University of 7th October, Misurata, Libya.

The present study was an attempt to evaluate the effects of four temperatures (20, 25, 30 and 35°C) on some biological traits of the southern cowpea weevil *Callosobruchus maculatus* (F.) (Coleoptera: Bruchidae) reared on cowpea seeds in the laboratory at constant relative humidity. Life cycle duration was significantly reduced by increasing temperature from 62.80 at 20 °C days to 30.5, 21.34 and 21.23 days at 25, 30 and 35°C, respectively. Eggs hatching rate was 59, 97, 51 and 80% at those temperatures, respectively. The mean adult life duration recorded was 14.4, 10.3, 7.2 and 3.5 days for male, and 12.7, 8.0, 6.0 and 4.2 days for females at temperatures of 20, 25, 30 and 35 °C, respectively.

E 47

EFFECT OF DROUGHT STRESS ON THE POPULATION DENSITY OF CERTAIN ARTHROPOD PESTS AND PREDATORS INHABITING COWPEA PLANTATIONS. F. A. Abdel-Galil¹, M. A. M. Amro² and A. S. H. Abdel-Moniem³. (1) Plant Protection Department, Faculty of Agriculture, Assiut University, Egypt; (2) Plant Protection Research Institute, Agricultural Research Centre, Dokki, Giza, Egypt; (3) Department of Pests and Plant Protection, National Research Centre, Dokki, Cairo, Egypt, Email: abdellah65@yahoo.com

To evaluate the impact of drought stress on the population density of some arthropod pests and their associated predators which inhabit cowpea plantations, field tests were conducted in two different levels of irrigation (10 and 20 days intervals) by using five newly developed cowpea cultivars (Dokki 331, Kaha 1, Monarch black eye, TVu21 improved and Kafr El-Seikh 1). Results indicated that the main piercing and sucking pests *Bemisia tabaci* (Genn.) and *Tetranychus urticae* Koch. were represented in high numbers in stressed plantations than in non-stressed ones. On the other hand, the common predators associated with these pests were not affected by irrigation levels. The damage caused by the pod borer pest *Etiella zinckenella* Treitschke was higher on stressed plantations than on the normally irrigated ones in most of the tested cultivars. At harvest, the results obtained indicated an obvious decrease in the net yield of all the

stressed cultivars. Therefore, to improve yield it is recommended to irrigate cowpea plantations at least every 10 day intervals to avoid high infestations by sucking pests and pod borers.

E 48

PHOSPHINE RESISTANCE IN FIELD STRAINS OF *RHIZOPERTHA DOMINICA* (FABRICIUS) INFESTING WHEAT AND BARLEY GRAIN IN 10 STORAGE FACILITIES IN NORTHERN SYRIA. Abdul Aziz Niane¹, Serpil Kornosor², A.J.G van Gastel¹ and Zewdie Bishaw¹. (1) ICARDA, P.O. Box 5466 Aleppo, Syria; (2) Cukurova University, Adana Turkey, Email: a.niane@cgiar.org

To assess the presence, extent and reasons for Phosphine resistance, 14 grain samples infested with *Rhizopertha dominica* (Fabricius) were collected from storage and grain handling facilities of 10 institutions in northern Syria. The 14 strains were subjected to a range of Phosphine concentrations including the discriminating dose of 0.03 mg/l for 20 hours at 25 °C and above 75% relative humidity. Two out of the 14 strains tested were found resistant. The level of resistance was as high as 2.8 and 8.1 folds of the susceptible strains at the LD₅₀ level and 3.4 and 3.8 at the LD₉₀ level. The two out of 14 resistance rate detected in this study is less than the 23.4% resistance rate reported on *R. dominica* in the FAO global survey of 1972, but nonetheless is substantial. Sub-lethal dosage resulting from non-air-tight conditions during fumigation may be the reason.

E 49

SEASONAL ABUNDANCE OF CEREAL APHIDS AND LADYBIRD BEETLE, *COCCINELLA UNDECIMPUNCTATA* (L.) IN FOUR CEREAL CROPS IN SOUTH EGYPT. F.A.A. Slman and M.A. Ahmed, Plant Protection, Agriculture Research Center, Dokki, Giza, Egypt, Email: dr_homam@hotmail.com

Field experiments were conducted at Shandaweel Agriculture Research Station, Sohag, A.R.C, during 2004 and 2005 seasons for wheat and barley, and for sorghum and maize during 2003 and 2004 seasons. Results showed that wheat plants were infested with the oat aphid, *Rhopalosiphum padi* (L.), the greenbug *Schizaphis graminum* (Rond.), the corn leaf aphid *Rhopalosiphum maidis* (Fitch) and the English grain aphid, *Sitobion avenae* (Fab.). *R. padi* started to appear earlier than *S. graminum*, *R. maidis* and *S. avenae*, respectively. The peak of these aphids occurred on 26-27 March and it was in harmony with the highest numbers of *C. undecimpunctata* during the two studied seasons. Barley plants were infested with *R. maidis* on the first week of February in the two seasons. The aphids peak occurred from the end of February to the first week of March in the two seasons, and it was in accordance with highest numbers of *C. undecimpunctata*. As for the sorghum plants, *R. maidis* started to appear earlier than *S. graminum*, *R. maidis* on the 2nd and 3rd of July during 2003 and 2004 seasons, respectively. *S. graminum* reached its maximum number in the first week of September and the last week of August during 2003 and 2004 seasons, respectively. The corn leaf aphid reached its peak on the last week of August during the two seasons, in accordance with the highest numbers of *C. undecimpunctata*. Corn plants were only infested with the corn leaf aphid. This pest started to infest corn plants on the first week of August in 2003 and 2004 seasons. However, its peak was observed on the first week of September during 2003 and 2004 seasons, which coincided with the high numbers of the ladybird beetle, *C. undecimpunctata*.

E 50

PRELIMINARY SURVEY FOR TOMATO PESTS (INSECTS AND MITES) IN GREENHOUSES IN THE SYRIAN COASTAL REGION. Mohammad Ahamad, Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

A survey of insect and mite pests, was conducted on greenhouse tomatoes in Syrian coastal region (Lattakia and Tartous) during the 2004/2005 and 2005/2006 growing seasons. The following pests were recorded: *Bemisia tabaci*, *Trialeurodes vaporariorum* (Homoptera: Aleyrodidae), *Liriomyza* sp. (Diptera: Agromyzidae), *Plusia gamma*, *Spodoptera littoralis*, *Helicoverpa armigera*, *Agrotis* sp., *Chrysodeixis chalcites* (Lepidoptera: Noctuidae), *Agriotes* sp. (Coleoptera: Elateridae), *Tetranychus urticae* (Acari: Tetranychidae), *Aculops lycopersici* (Acari: Eriophidae), *Aphis gossypii*, *Myzus persicae* (Homoptera: Aphidae), *Thrips tabaci* (Thysanoptera: Thripidae). The occurrence dates, and population density changes were determined for some pests in some locations.

E 51

ASSESSMENT OF DAMAGE CAUSED BY WIREWORMS *AGRIOTES* SPP. TO POTATO CROP IN THE CENTRAL OF IRAQ. R.S. Al-Jorany¹ and Azzy Habitalla Shoraim². (1) College of Agriculture, University of Baghdad, Baghdad, Iraq, Email: redha-aljorany@yahoo.com; (2) Yemen, Email: shoriam74@yahoo.com

The study was conducted in three different fields in Radhwania, Baghdad Province, Iraq during 2003 and 2004 potato growing seasons in order to assess the damage caused by wireworm *Agriotes* spp. The rate of infection and damage in the spring season was higher than that in the fall season. The rate of damaged tubers was 37%, which led to 50.60% reduction in total weight, whereas the rate in the fall season was 18.52% and 22.62%, respectively. The most injured was the class of small weighted tubers. The damaged small size tubers represent more than 50% of all classes of tubers. It was possible to correlate the damage level to the number of holes without cutting the tubers.

E 52

DETRMINATION OF SOME MORPHO-BIOLOGICAL PARAMETERS WITH *EPHESTIA KUEHNIELLA* (ZELL) AND *BRACON BREVICORNIS* (WESM) REARED AT THE BIOLOGICAL CONTROL CENTER IN HASAKA, SYRIA. Rawda Al-Hashemi¹ and Louai Aslan². (1) Al-Hasake Center for Rearing Natural Enemis, Al-Hasake, Syria; (2) Faculty of Agriculture, Damascus University, Damascus, Syria, Email: louai@arabscientist.org

Some morpho-biological parameters of the laboratory-reared *Ephestia kuehniella* (Zell), and *Bracon brevicornis* (Wesm) were studied at the Biological Control Center in AL-Hasaka, Syria during 2005. The biological study of the alternative insect host showed that the life cycle of the butterfly continued up to 96.1 days under laboratory conditions. There were no significant differences between the age of males and females. Whereas for parasite, there was a significant difference between the males and females age (3.3 ± 0.15 and 6.3 ± 0.5 days, respectively). Most of the males died after pupal instar, estimated by three days after mating, while females survived up to six days after mating and egg-laying at 28 ± 1 C°. The duration of the embryonic development was 1.3 ± 0.11 days, and 3.4 ± 0.18 days for the larva development, and 11.1 ± 0.35 days for the pupa development.

E 53

CONTRIBUTION IN THE STUDY OF BIOECOLOGY OF THE ENTOMOFAUNA OF THE *AMPELODESMA MAURITANICUM* IN THE TLEMCEN REGION, ALGERIA. Amina Damerdji, Departement of Biology, Faculty of Sciences, University Aboubekr Belkaid., B.P. 119, Tlemcen, Algeria, Email :damerdji_halim@yahoo.fr

The region of Tlemcen is situated in the occidental north of Algeria. The degradation of forests causes an open formation often called "mattoral" containing Diss and Doum. *Ampelodesma mauritanicum*, a "xerophile" plant that adapts it self to climatic conditions which are rather dry by having certain morphological characteristics. We proposed to study the entomofauna piedged to vegetal species. Three stations in the city of Mansourah were surveyed from July 2000 to March 2001. The inventory has permitted us to collect 112 species, 88 of which are part of the entomofauna which is very diversified. The insecta Pterygota include 85 species and 3 species are apterygota. Concerning insecta Pterygota, the order of *Coleoptera* is the most important with 22 species followed by the order of *Orthoptera* with 16 species. The *Hymenoptera* include 14 species and *Lepidoptera* 13 species, 11 species of *Hemiptera* and 6 species are *Diptera*. The specific richness of *Dermaptera* remains weak with only 2 species, and *Nevroptera* with one specie. A comparaisn is realised between three stations for different orders. The seasonal and monthly importance of the various groups entomofaunic met were given. The use of statistic methods gave us information for the entomofauna of *Ampelodesma mauritanicum*.

E 54

ARMOURED SCALE INSECTS AND THEIR NATUREL ENEMIES IN MITIDJA (ALGERIA). Hafida Saighi, Département de Biologie, Université Saad Dahleb, B.P.270, route de Soumaa, Blida, Algérie, Email: hdhh@caramail.com

The research made on scale insects in Mitidja (sublitoral vast plain of Algeria) allowed to identify 50 species of *Diaspididae* belonging to four sub-families, Aspidiotinae, Diaspidinae, Leucaspinae and Odonaspinae. The sub-family Aspidiotinae included the largest number of species (42%), followed by Diaspidinae with 16 species (30%), sub-family Leucaspinae with 11 species (22%), and Odonaspinae (2%). Two scale insects *Clavaspis herculeana* which attack Asteraceae, Fabaceae and Euphorbiaceae and *Parlatoresia chinensis* on *Ficus retusa* were reported for the first time in Algeria, North Africa and the Mediterranean region. Natural enemies belonging to *Hymenoptera* parasites (Aphelinidae) and to Coleopteran predators (Coccinellidae) were also identified.

E 55

BIOLOGICAL AND ECOLOGICAL STUDY OF PAMPHAGIDAE (ORTHOPTERA) IN ALGERIA. Mustapha Bounechada¹ and Salah Eddine Doumandji². (1) Department of Biology, Faculty of Sciences, University of Setif, Algeria, Email: Bounechadam@yahoo.fr; (2) National Institut of Agronomy, El-Harrach, Algiers, Algeria.

The family of Pamphagidae is represented by few species throughout the world. The known Pamphagidae species (Orthoptera) is estimated to be 300 species world wide. The geographical distribution is often limited to the arid areas; North Africa, Southern of Europe and Asia. In Algeria, we recorded fourteen species until now. Because there is a little information about the Pamphagidae of Algeria, the aim of this work is to provide a list of species, their description, biology and ecology in this country.

E 56

BIOLOGY AND CONTROL OF THE SHOOT FLY *ATHERIGONA SOCCATA* ROND. ON SORGHUM. Hameed H. Mohammed¹ and Adel I.Al-Nakhli². (1) Plant protection Department, College of Agriculture, Abu-Ghraib, Baghdad, Iraq, Email: alkarbolihameed@yahoo.com; (2) Taaz Province, Yemen.

The shoot fly *Atherigona soccata* (Diptera: Muscidae) is one of most important pests attacking sorghum, maize and millet in many parts of Asia and Africa. Laboratory and field investigations were conducted to study some aspects of biology, damage and control of this pest. The shoot fly *A. soccata* is considered to be a new record on sorghum, maize and johnson grass in Iraq. Females started oviposition on sorghum seedlings one week after emergence. Eggs were white, elongate and approximately 1.25-1.30 mm in length. A peak of oviposition of 15.33/ten seedlings were recorded during the fifth week and no eggs were observed during the eight the week after emergence. Adults lay more eggs on the third and fourth leaf, with an average of 22 eggs/ten seedlings. Larvae were nearly 1.5-7.8 mm long, vermiform and creamy white in color. Larvae tunneled in the sorghum seedlings causing wilt and finally a dead heart. About 93% of the mature larvae were observed to make an exit hole in the crown of the seedlings stalk and pupate inside the stalk near the soil surface. Pupal developments were completed in about 7 days. There were no significant differences between the three sorghum cultivars (Inkhad, Rabih and Kaifer) tested in terms of resistance to the shoot fly. The average infestation four weeks after emergence was 66%. Shoot fly caused more dead hearts to sorghum seedlings than the corn pink borer, *Sesamia cretica* Led.

E 57

EFFECT OF ABIOTIC FACTORS ON POPULATION OF *BREVICORYNE BRASSICAE* L. ON CANOLA CROP IN VARAMIN PROVINCE (IRAN). A.A. Keyhanian, Plant Pests and Diseases Research Institute, P.O. Box 1454, Tehran 19395, Iran, Email: akeyhanian@yahoo.com

Cabbage aphid, *Brevicoryne brassicae* L. is a key pest on canola crop which decreases its quality and yield by sucking plant sap. Field studies during 2001-2003 revealed that activity of *B. brassicae* L. differs in the different regions of Iran. In Tehran province (Varamin region), the initial infestation and the establishment of aphid colonies starts on young canola seedlings (Winter crops) during November and spreads in February and March depending on climatic conditions. Maximum population of *B. brassicae* L. was observed during April-May and then gradually declined. Path coefficient analysis of abiotic factors

affecting the population of *B. brassicae* L. on canola crop showed that minimum temperature, minimum relative humidity and sunshine had direct positive effect on the aphid population.

E 58

COMPARATIVE STUDY OF CUTICULAR HYDROCARBONS COMPOSITION OF PAMPHAGUS ELEPHAS AND PAMPHAGUS MARMORATUS. Farida Benia¹ and Mustapha Bounechada². (1) Department of Agronomy, Faculty of Sciences, University of Setif; (2) Department of Biology, Faculty of Sciences, University of Setif, Algeria, Email: Bounechadam@yahoo.fr.

Gas chromatography and mass spectrometry were used to compare the cuticular hydrocarbon composition of males and females of *Pamphagus elephas* and *Pamphagus marmoratus* (Orthoptera: Pamphagidae). The cuticular hydrocarbon composition was found to consist mainly of the following: monounsaturated alkenes; 73.9% C24 to C36 compounds in *Pamphagus elephas* and 79.9% C24 to C34 compounds in *Pamphagus marmoratus*, monomethyl content was 8.8% in *P. elephas* and 4.8% in *P. marmoratus*, dimethyl content was 2.1% in *P. elephas* and 6.6% in *P. marmoratus*, and trimethyl content was 4.1% in *P. elephas* and 4.3% in *P. marmoratus*. Sex-dependant, quantitative differences in certain hydrocarbons were apparent in both species. The variability in the composition of cuticular hydrocarbons in the analyzed species, produced different patterns according to species and sexes, which reinforces the role of these compounds in differentiation among species that are morphologically similar.

E 59

SURVEY OF INSECTS ASSOCIATED WITH THE THORNY PLANT, CYNARA SP. (ASTERACEAE) IN IRAQ. Adil H. Amin, Department of Plant Protection, College of Agriculture, University of Salahaddin, Erbil, Iraq, Email: nadeemramadan@yahoo.com, saidkhalid88@yahoo.com

The present study was conducted during the period September 2001 - August 2003 to survey the insect species associated with the thorny plant, *Cynara* sp. in Iraq. The study also investigated the relationship between these insects and the host plant. The results showed that 27 species of insects belonging to 19 families and 7 orders were recorded associated with *Cynara* sp. The species observed included 9 species of order Coleoptera; *Agapanthia annularis* L. and *A. cardui* L. in the family Cerambycidae, *Cassida* sp. and *Phyllotreta* sp. in the family Chrysomelidae, *Coccinella septempunctata* L. and *C. novemnotata* L. in the family Coccinellidae, *Larinus* sp. and *Lixus* sp. from family Curculionidae and *Potosia morio* F. from family Scarabaeidae. The order Diptera included 2 species, *Acanthiophilus helianthi* Rossi and *Chaetorellia carthami* Stack in the family Tephritidae. In addition, 3 species of order Hemiptera were recorded; *Anthocoris* sp. in the family Anthocoridae, *Spilostethus pandurus* Scop. in the family Lygaeidae and *Dolycoris baccarum* L. from family Pentatomidae. The order Homoptera included 3 species; *Aphis compositae* Theobald and *A. craccivora* Koch in the family Aphididae, and *Empoasca* sp. in the family Cicadellidae. Three species of order Hymenoptera were recorded; *Andrena* sp. and *Apis mellifera* L. in the family Apidae, and *Megachile* sp. in the family Megachilidae. The order Lepidoptera included 6 species; *Pieris rapae* L. and *Colias croceus* Fourc. in the family Pieridae, *Pyrgus* sp. in the family Hesperidae, *Vanessa cardui* L. in the family Nymphalidae, *Pyronia* sp. in the family Satyridae, and *Macroglossa stellatarum* L. in the family Sphingidae. The order Thysanoptera included one species, *Thrips* sp. in the family Thripidae. The results also showed that the species *Agapanthia annularis*, *A. cardui*, *Larinus* sp., *Lixus* sp., *Potosia morio*, *Acanthiophilus helianthi* and *Chaetorellia carthami* can be used as biological agents for *Cynara* sp. weed control.

E 60

BIODIVERSITY AND BIOECOLOGICAL OUTLINE OF ORTHOPTERA IN PART OF MAGHNA OF TLEMEN REGION, ALGERIA. Amina Damerdji. Departement of Biology, Faculty of Sciences, University Aboubekr Belkaïd, B.P. 119, Tlemcen, Algeria, Email: damerdji_halim@yahoo.fr

A study on diversity of orthoptera fauna found in Maghnia of Tlemcen region was conducted between March and September, 2005. The specific Orthoptera richness was estimated to be 18. An analysis of species showed that 2 was accessory, 6 accidental and 10 very accidental. The importance of Orthoptera spp. fluctuated in 3 stations surveyed, based on seasons and months. In spring, 7 species were identified in the second station. In summer, 12 species were found in the first station. During March, April, may and July

2 species in the third station. *Calliptamus barbarus* (Acrididae) had a frequency of 61.53% in the first station (Sidi- Belkhir) and 38.46% in the second station (Route Sabra) but was not present in the third station (Hammam Chiguer). *Oedipoda fuscocincta* had a frequency of 53.84% in the first station and was not present in the other two stations. *Oedipoda miniata* was not present in the first station, and occurred at 18.42% in the second station. Similar abundance (0.59%) in the first station was observed for 3 species: *Tmethis maroccanus* (Pamphagidae), *Oedipoda coerulescens coerulescens* and *Anacridium aegyptium* (Acrididae). The same level of occurrence was value is found for 3 species of Gryllidae in the first station. These species were not present in the second and third stations. *Tmethis maroccanus* occurred at the same level in stations 2 and 3.

E 61

A SURVEY OF CUT WORMS IN NORTHERN IRAQ. Haitham M. Al-Jalal, Faculty of Agriculture, Mosul University, Mosul, Iraq, Email: d.haitham@yahoo.com

A survey of cut worms in northern Iraq was conducted during 2003. The total captivity of cutworms adults were (3978) of the Noctuidae family captured by light traps in three locations (Al-Rashidia, Al-Shalalat, Yarimcha). Captured insects belonged to twelve species, three of them were terranean species, namely *Agrotis ipsilon* (Hufn), *A. segetum* (Schiff) and *A. spiniera* (Hubn) and their capture rate was 19.1, 7.74 and 5.15%, respectively. The remaining nine species were climbing species, namely *Anua trihaca* (Cr.), *Dysgonia parallela* (Guen.), *Earias insulana* (Boisd), *Heliiothis amigera* (Hubn.), *Mythimna loreyi* (Dup.), *Sesamia cretica* (Led.), *Spodoptera exigua* (Hubn.), *S. litura* (Fab) and *Trichoplusia ni* (Hubn.), and their capture rate was 2.46, 2.86, 12.56, 3.24, 6.33, 7.41, 15.23, 7.39 and 10.48, respectively. The adults capture rate in Al-Rashidia, Al-Shalalat and Yarimcha was 42.84, 14.78 and 42.38%, respectively where Al-Rashidia and Yarimcha differed significantly from Al-Shalalat. The first record for adults capture was in the first half of February and the final capture was in the second half of November. The traps were almost empty during winter. There was a positive correlation between capture density and temperature average, and a non-significant negative correlation with relative humidity and rain fall.

E 62

HOST RANGE OF SAP BEETLES (NITIDULIDAE) IN THE COASTAL REGIONS OF LIBYA. M.Z. Najla and H.M. Kerra, Plant Protection Department, University of Al Fateh, Tripoli, Libya, Email: najla_elzaidi@yahoo.ca

Sap beetles of the family Nitidulidae are one of the most important insect pests infesting a considerable number of economically important host plants in the field, stores, and super-markets. A study was conducted to determine the host range of sap beetles associated with fruit and vegetable crops in coastal regions of Libya. The following seventeen regions were selected: Tawrga, Mosratha, Zliten, Wadi Kaam, Al-Khoms, Besees, Al-Garaboly, Wadi Alrabiae, Tajora, Ein Zara, Janzoor, Al-Soani, Al-Zahra, El-Zawia, Sobrata, Al-Ajilat and Jemeal). Results showed that sap beetles were present in all regions surveyed. Twenty species were recorded as natural host plants. Date fruits, apricot, peach, plum, apple, citrus, lemon, pomegranate fruits, figs, pear, grape, guava, strawberry, olive, tomato, onion, water melon, squash, and pumpkin. The mean infestation rate was 68-100% on fruit trees. The highest population of the pest was found on pomegranate fruits, date fruits, apricot, peach, apple, figs, citrus, and tomato, in all regions surveyed. Results indicated the presence of seven species of sap beetles, the most dominant were: *Carpophilus hemipterus*, *C. dimidiatus* and *Urophorus humeralis*. Results also showed that sap beetles attack unripe, ripe and fallen fruits in the field, and are found all year round. Since the numbers of plant hosts are increasing, an urgent integrated program is needed to control this pest.

E 63

THE NOCTUIDAE (LEPIDOPTERA) OF JORDAN. Ahmad Katbeh Bader, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, 11942, Jordan, Email: Ahmadk@ju.edu.jo

Specimens of Jordanian Noctuidae (Lepidoptera) were examined which were kept at the University of Jordan Insect Museum and the Ministry of Agriculture, in addition to specimens collected by the author since 1992. A list of species was prepared based on the examined specimens and on species recorded previously from Jordan. More than 50 species were listed belonging to more than 30 genera. Some of these

species are considered important pests on cultivated plants and on forest trees, while many species feed on wild plants.

E 64

COMPUTER APPLICATION IN ENTOMOLOGICAL STUDIES. Aead Y. Ismail, Biology Department, Education College, Mosul University, Mosul, Iraq, Email: aeadismail@yahoo.com

Since 2000, 15 educational CDs prepared in entomological studies were prepared in the multimedia laboratory. In the Ejaz of the Quran, two CDs, "fly creation: an example of the Ejaz of the Quran" and "Treatment with Honey Bee Products: the Ejaz of the Quran (2005)". In education and information fields, the following CDs were produced: Research on Pests of Stored Product of IRAQ: Database (2000), Teaching of the science of Entomology laboratory aided by Computer (2003), Facts and information on Sun Pest (2005), Collecting, Preservation, Identification and Study of Insects (2006). In the Internet fields, the following CDs were prepared: Gateway to Entomological Science sites, Stored Products Pests Research down loaded from the Internet (2005), Protection of Food and Feed Products, physiological and ecological presentations on insects, The Syllabuses of Entomological science in the world from the Internet, and finally, the Ehab Baker collection of scientific programs (2006).

E 65

BIOLOGY OF *APORIA CRATAEGI* L. IN CENTRAL SYRIA AND ITS CONTROL MEASURES. Wajih Alkassis and Amanni Shlallo, Faculty of Agriculture, Damascus University, Damascus, Syria, Email: lamsamer@scs-net.org

The life cycle of *Aporia crataegi* L. was studied in the central region of Syria during the period of 2003-2006. The insect attacked almond, apple, azarole, mahlab (type of wild cherry) and willow tree. Mating and oviposition occurred at the beginning of April. Eggs hatched after 13-15 days. Larvae (5 instars) attacked leaves and formed silken net at the top of twigs and hibernated inside it during summer and autumn. In the following February, larvae started activity at the time of almond buds sprouting and fed voraciously on them and caused great damage. The study showed that the insect population was affected by many factors: (1) parasitism was 29, 21 and 41% in 2004, 2005 and 2006, respectively by *Apanteles* spp.; (2) deformation of wings; (3) incomplete metamorphosis in some cases, and (4) diseases that cause drying and death of pupae or loss of wings. Observations revealed that there was a 10% extra mortality by the applied insecticide compared to natural death factors.

E 66

ALMOND'S IMPORTANT PESTS IN CENTRAL SYRIA AND THEIR CONTROL MEASURES. Wajih Alkassis and Rawda Sookar, Faculty of Agriculture, Damascus University, Damascus, Syria, Email: lamsamer@scs-net.org

In Syria, almond plantations are located mainly in the central area (Homs city and surroundings). This crop is attacked heavily by several insect pests, affecting the productivity and survival of trees. The most important insect pests were: *Eurytoma amygdali* End., *Capnodis carbonaria* Klug, *C. tenebrionis* L., *Aporia crataegi* L. and the moth, *Lymantaria lapidicola* H.S. However, almond seed wasp *E. amygdali* was considered as the most serious pest with the highest infestation rate of 90% in 2002 followed by curculio, plum fruit worm. Chemical spray was carried out to control *E. amygdali* with the following insecticides: Desis D, Zenet, Agrothoel and Mezrol and this treatment resulted in reducing the infestation up to 10%. Recently, in collaboration with French Center of Agricultural Research (INRA), trials to determine the date of the first appearance of this insect in the field by using sex pheromone traps are carried out, in order to identify the best time to control this pest.

Desert Locust

DL 1

CLASSIFICATION OF PAMPHAGIDAE (ORTHOPTERA: ACRIDOIDEA) IN FEZZAN REGION OF LIBYA. Abdulgader Ali Ajaili and Mohammad Kamil Usmani, General Science Department, Faculty of Eng. & Technology, Sebha University, P.O. Box 68, Brack Al-Shati, Libya, Email: dr_ajaili@hotmail.com, dr_ajaili@yahoo.com

The present study is based on six genera of the family Pamphagidae. Brief diagnosis of the family Pamphagidae is given. Key to the subfamilies and genera belonging to this family in Fezzan region "Fezzanian Pamphagidae" was given mainly based on conventional as well as genitalic characters. Presence or absence of teeth in the upper side of middle tibia; presence or absence of external apical spine of hind tibia; long or short condition of aedeagal sclerites; long or short condition of ovipositor valves; with or without a ridge or tooth and strongly or slightly widened condition of ventral valve of ovipositor; shape of diverticula of spermatheca; presence or absence of setae on posterior margin of female subgenital plate, are used as stable characters for separating the subfamilies. Oblique or vertical condition of frons, sulcated or flattened condition of frontal ridge, shape of antennae, shape and ratio of length and width of pronotum, ratio of length of prozona and metazona of pronotum, presence or absence of median and lateral carinae on pronotum, number of sulci crossing dorsum of pronotum, median carina with or without longitudinal furrow; slightly or deeply incised condition of frontal crest, bidentate or trilobate condition of median carina in prozona; shape of prosternal process; shape of tegmina; presence or absence of fascia on hind wings; long and narrow or short and wide condition of hind femur; shape of male subgenital plate, supra-anal plate and cerci; narrow or wide condition of epiphallus; shape of posterior margin of female subgenital plate; presence of setae on the whole posterior margin or confined to lateral margins only; toothed, tuberculated, or smooth condition of ovipositor valves, length of the lateral apodeme in relation to the dorsal valves were used as useful generic characters.

DL 2

EFFECT OF TWO ENTOMOPATHOGENES (*BEAUVERIA BASSIANA* AND *METARHIZIUM ANISOPLIAE*) ON SOME PHYSIOLOGICAL PARAMETERS OF THE DESERT LOCUST *SCHISTOCERCA GREGARIA* FORSKAL. B. Doumandji-Mitiche, S. Doumandji, N. Kaidi and S. Hemour, Department of Agricol and Forestry Zoology, National Agronomic Institute, El-Harrach, Algiers. Email: doumandjimitiche@yahoo.fr

The effect of the entomopathogens *Beauveria bassiana* and *Metarhizium anisopliae* var *acridum* on some physiological parameters of the desert locust such as breathing rhythm, the cardiac rhythm and the hemogramme was evaluated. The used locusts were collected from Adrar region. *B. bassiana* was isolated from bees collected from a pond in Reghaia region during April, 2003 and was used at a dose of 2.83×10^6 spores/ml. in distilled water, which is the LC50 calculated previously. The entomopathogen *M. anisopliae* var *acridum* was obtained in May, 2005 from the National Institute of Plant Protection in the form of the biopesticide "Green muscle", formulated in an oily suspension and used at the dose of 14×10^6 spores/ml, as a contact treatment. Physiological disorders were noticed from the 3rd day after treatment, and translated by decline of the frequency of stigma openings from 85.33 to 36.30 openings/mn and from 80.42 to 38.40 openings/mn, respectively for females and males treated by *B. bassiana*, and a decline from 85.88 to 42.38 openings/mn and from 85.33 to 44.08 openings/mn, respectively for females and males treated by *M. anisopliae*. A similar decrease in heart rhythm was noted for to the treatment by *B. bassiana* with a decline from 78.09 to 35.65 beatings/mn in females and from 77.42 to 37.12 beatings in males. The treatment by *M. anisopliae* reduced the number of the cardiac beatings from 80.30 to 44 beatings/mn for females and from 82.05 to 44.25 beatings/ mn for males. The qualitative study of the hemogramme of *S. gregaria* allowed us to identify 3 categories of cells; prohemocyties, plasmatocyties and granulocyties. The quantitative study indicated that on the 3rd day after treatment, decline from 113.25 to 19.50 prohemocyties/5 μ l of hemolymph and from 151.25 to 23.25 plasmatocyties/5 μ l of hemolymph was observed.

DL 3

MORPHOMETRY AND DIET OF THE DESERT LOCUST *SCHISTOCERCA GREGARIA* (IN SOME REGIONS OF ALGERIA. B. Doumandji-Mitiche, Y. Kherbouche and S. Hemour, Department of Agricol and Forestry Zoology, National Agronomic Institute, Algiers, El-Harrach, Algiers, Email: doumandjimitiche@yahoo.fr

Following the invasion of the desert locust *Schistocerca gregaria* (Acridida: Cyrtacanthacridinae) to Algeria in February, 2004 and the outbreaks which followed, it was useful to make a bioecological study (biometry and diet) of this pest in various regions of the Algerian Sahara. The comparison of E/F and F/C ratios allowed us to observe that populations collected from the regions of Laghouat (n=12 females, 8 males), Biskra (n=27 females, 25 males), Djelfa (n=7 females, 6 males), Adrar (n=3 females, 8 males), Oued Souf (n= 2 females, 25 males) and Touggourt (n=45 females, 55 males) were in the gregarious stage with an average of $2.19 \pm 0.21 \leq E/F \leq 2.44 \pm 0.09$ and $3.28 \pm 0.12 \leq F/C \leq 3.47 \pm 0.27$ for the females and $2.19 \pm 0.21 \leq E/F \leq 2.37 \pm 0.08$ and $3.24 \pm 0.09 \leq F/C \leq 3.48 \pm 0.20$ for the males. The majority of the individuals of these same populations were transients congregants, while some were gregarious. The study of the diet was conducted in two stations, Boudda and Baâmar situated in Adrar (0°11'E.; 27°49'N) at 1543 km south of Algiers. The selection of the region was justified by the permanent presence of this locust on the irrigation pivots. In the station of Boudda (a palm plantation situated at 20 km of the city of Adrar), five botanical species were identified in the feces of males (n=15) and females (n=10). *Phoenix dactylifera* was the most attacked species with 62.86% for males and 62.05% for females. The second species attacked was *Arundo plinii* (Poacea) at the rate of 27.14% for males and 32.55% for females. *Arachis hypogera*, *Mentha specata* and *Punica granatum* were less attacked. In the station of Baâmar (a small field with vegetable and cereal crops situated in 45 km in the southeast of the city of Adrar) six botanical species were identified in the feces of females (n=14) and four in those of the males (n=15). The botanical species attached most by the females were *Arundo donax* (57.18%), *Solsa vermiculata* (12.94%) and *Lycopersicum exulentum* (11.93%). As for males, *Arundo donax* was attacked most (85.53%), followed by *Solsa vermiculata* (85.53%) and *Phoenix dactylifera* (7.62%).

DL 4

A STUDY ON OVARY DEVELOPMENT OF THE LOCUST *CALLIPTAMUS BARBARUS* IN ARID AND WET CLIMATES IN ALGERIA. Benzara Abdelmadjid¹ and Alain Louveaux². (1) Institut National Agronomique, El-Harrach, Alger, Algeria, Email: benzaraabdelmadjid@yahoo.fr; (2) Labo ESE Bât. 362, Université Paris Sud, F91405 Orsay, Paris, France.

The temporal fecundity of *Calliptamus barbarus* (Orthoptera: Acrididae) is badly known until recently. It appears indeed that the production of ovules is much more important in the arid than in the wet climate. The maximum number of ovules was 56 and 58, respectively, in the wet and the arid climates. Laying of eggs do not happen more than twice in both climates. On the other hand, the resorption of eggs is very high when the climatic conditions are unfavourable. The number of ovules retained in the chalice of the ovary is less than the traces of layings. That means the female laid eggs at least once. The retention of eggs begins September and continues until October regardless of the climate. The ovary output reaches 79% in the arid climate and 94% in the wet climate. It appears that the fecundity increases in wet climate and decreases in the arid climate but the reproductive potential of *Calliptamus barbarus* remains average compared to other locust species of the same family.

DL 5

STUDY OF THE ACTION OF ENTOMOPATHOGENIC FUNGUS *METARHIZIUM ANISOPLIAR* VAR. *ACRIDIUM* ON A DESERT LOCUST *SCHISTOCERCA GREGARIA*. Bahia Doumandji-Mitiche¹ and Fatima Zohra Bissaad². (1) Department of Agricol and Forestry Zoology, National Agronomic Institute, El-Harrach, Algiers, Algeria; (2) Department of Biologie, Faculty of Science, University of Boumerdès, Algeria, B P 35000, Boumerdes, Algeria, Email: bissaad@yahoo.com

Chemical pesticides largely contributed to crop protection against the desert locust. However, it had negative effect on the environment, human and animal health and reduced the population of useful insects. In the search of new environment friendly techniques, a bio-pesticide "Green Muscle" was evaluated in this study. Three doses applied by ingestion were applied on the fifth stage larvae of *S. gregaria*. The treatments

were $D1=10^6$ spores, $D2 = 2 \times 10^6$ spores and $D3 = 4 \times 10^6$ spores per ml. The best results were obtained with the highest concentration. The examination of the various parts of the digestive tracts of L5 of *S. gregaria* under the optical microscope highlighted notable differences in structure of the treated individuals compared with the control.

DL 6

LABORATORY SCREENING FOR INSECTICIDAL PROPERTIES OF SOME PLANT PRODUCTS AGAINST THE MIGRATORY LOCUST, *LOCUSTA MIGRATORIA* LINNE. Abdalla M. Abdalla¹, M. H. Luong-Shovmand², M. Lecoq² and S. El-Bashir³. (1) University of Kordofan, P.O. Box 160, El-Obeid, Sudan; (2) Centre de Coopération Internationale en Recherche Agronomique pour le Développement, Montpellier, France; (3) Department of Crop Protection, Faculty of Agriculture, University of Khartoum, Shambat, Sudan, Email: khalil2004@hotmail.com

The development of environment friendly locust control methods have attracted attention in recent years. Many products, including botanicals, were extensively evaluated as possible alternatives to the commonly used chemical pesticides. In this paper the results of laboratory tests of extracts of four plants, namely *Mucuna pruriens* (Fabaceae), *Adenium obesum* (Apocynaceae), *Azadirachta indica* (Meliaceae) and *Calotropis procera* (Asclepiadaceae) against the migratory locust (*Locusta migratoria*) will be presented. Water or water/ethanol extracts were screened for their locusticidal properties, both as contact and stomach insecticides. Knockdown, mortality and time to death were assessed as indicators of efficacy. The bio-tests have shown that *Mucuna* extracts act both as contact and stomach insecticides. Up to 99% mortality of migratory locust was achieved by direct spraying of water or water/ethanol *Mucuna* extracts at 50 g/l. Similar killing rate was also obtained when locusts were fed on wheat seedlings treated with *Mucuna* (water/ethanol extract) at 50 g/l. *Mucuna* extracts, appeared to act faster on locust than neem extracts. The study concluded that *Mucuna* extract is a potential natural product effective against many crop pests.

DL 7

THE DISTRIBUTION OF INVASIVE AND REMISSIVE POPULATIONS OF THE MOVING LOCUST *SCHISTOCERCA GREGARIA* (FORSKÅL, 1775) IN ALGERIA. A. Guendouz-Benrima¹ and B. Doumandji-Mitiche². (1) Institut d'Agronomie, Université de Blida, B.P 09, 09470, Soumaa, Blida, Algérie, Email: atiguen@yahoo.fr; (2) Institut National Agronomique d'El Harrach, 16200, Algeria.

The gregarious ability of the moving locust *Schistocerca gregaria* Forsk (Insecta: Orthoptera) lead to comparatively study its behaviour during the remissive period (dominating lonely phase) and during the invasive period (dominating gregarious phase). In this study, we are presenting some adults and larvae frequency maps in Algeria prepared by FAO/COPR 1937-1991. The biogeography analysis of the moving locust in Algeria showed that the frequency sites are contagiously spreading. During invasions, the production area is stretched mainly in the anthropized Mediterranean regions threatening the agriculture of the country. During the remissive period, the reproduction area spread from the central Sahara to the meridional Sahara. Only the central Sahara and meridional Sahara are concerned with regular reproduction of the moving locust. Countries adjacent to Algeria are concerned with this situation and that for close monitoring and exchange of information among all countries affected by locust attack.

DL 8

EVALUATION OF THE BIOLOGICAL IMPACT OF BACTERIA ON DESERT LOCUST PILGRIM *SCHISTOCERCA GREGARIA*. H. Mohanad Kaci¹ and B. Doimandh-Mitiche². (1) Department of Biology, University M'hamed Bougara, Boumerdes, Algeria, Email mkbio2005@yahoo.fr; (2) INA, El-Harrach, Algiers, Algeria

Centuries ago, before the Christian era, problems caused by the Orthoptera have always caught attention. History witnessed great invasions of locust. Modern techniques made use of efficient chemical insecticides, to which Acrididae are particularly sensitive. However, the massive use of chemical insecticides has many disadvantages. That is why scientists looked for alternatives such as biological control. The efficiency of four bacteria (*Bacillus subtilis*, *Bacillus thuringiensis*, *Bacillus larvae* and *Pseudomonas aeruginosa*) to control *Schistocerca gregaria* stages L₁, L₂, L₃ and L₄ were evaluated. Different concentrations of the bacterial suspension were added to the insects died placed together with the nymphs in

smaller cages. Insects mortality was checked daily. The results obtained indicated that the locust mortality rate increased with the increase in the quality of the bacteria used. However, certain resistance towards the bacteria was observed in the advanced developmental stage of the locust.

DL 9

EFFECT OF DIFLUBENZURON ON THE LARVAE OF THE FOURTH AND FIFTH STAGE LARVAE OF THE DESERT LOCUST *SCHISTOCERCA GREGARIA* UNDER LABORATORY CONDITIONS. Tail Ghania¹, Batrick Bourchoroun² and Bahia Doumandji Mitiche³. (1) Department of Biology, Faculty of Agronomy, Veterinary and Biology Sciences, University Saad Dahleb of Blida, Algeria, Email: g-tail@caramail.com; (2) Biar & Marey Koury University, Paris 6, France; (3) Department of Agricultural and Forest Zoology, National Institute Agronomic El-Harrach, Algiers, Algeria.

Diflubenzuron, a benzoylphenylurea (BPU) was evaluated on *Schistocerca gregaria* (Orthoptera, Acrididae). Treatment was applied on newly 4th and 5th instar larvae for 24 h. The compound exhibited insecticidal activity and mortality occurred after earlier inhibition of their development or by their inability to complete their ecdysis. Treatment resulted in a significant larvicidal effect and in an inhibition of adult emergence. Moreover, the compound disturbed insect growth and development since several morphological types with an increase in the duration of larval stage were observed.

DL 10

BIOLOGICAL ACTIVITY OF AN INSECT GROWTH REGULATOR: TEFLUBENZURON ON LARVAL CUTICLE AND MIDGUT LEVEL OF *SCHISTOCERCA GREGARIA*. Fatma Acheuk¹ and Bahia Doumandji Mitiche². (1) University of Boumerdes, Département of Biology, Algeria; (2) Institut National of Agronomy, Département of Zoology, Algeria, Email: criquet72@yahoo.fr

This study was carried out to evaluate in the laboratory the biological activity of the Teflubenzuron on the morphological aspect of the cuticle and the midgut of the 5th instars larvae of *Schistocerca gregaria*. Topical application of a concentration of 2 µg was deposited beneath the pronotum of the 5th stage larvae. The Teflubenzuron did not have any effect on the external morphology of the treated larvae at such concentration. However, Teflubenzuron had a clear effect on the post ecdysial cuticle (endocuticle) and produced an amorphous structure in the treated larvae. At the mesenteron, the severity and speed of injury was observed in epithelial cells.

DL 11

IMPACT OF ENTOMOPATHOGENIC FUNGUS *METARHIZIUM FLAVOVIRIDE* EXPOSED TO ULTRAVIOLET RADIATION ON *SCHISTOCERCA GREGARIA*. Fatma Zohra Kara and Bahia Doumandji Mitiche, Department of biology, Faculty of Science Agrovétérinaires and biological, University Saad Dahleb, Algeria, Email: ihcene_faiza@yahoo.fr

Schistocerca gregaria is one of the most known serious pests at an international scale and most dangerous in Maghreb countries. It causes considerable damage to a given location and to move quickly long distances by crossing borders and to colonize in a very short time zones distant from each other. The discovery of chemical insecticides gave new tool to control locust. But intervention with insecticides could not stop the locust attack completely. Moreover, this approach was a source of pollution with negative effects on the environment. The use of microbial agents will be a safer alternative. This work is a contribution to the knowledge of the fungus *Metarhizium flavoviride* and the effect of UV radiation on its effectiveness to control *S. gregaria*. Results showed that the UV treated fungus grew extremely well and effectively infected the locust. Following the treatment with the UV irradiated fungus, the protein content in the locust blood reached 3.14 µg/l, whereas, the protein content was 28.3 µg/l in the locust treated with an unradiated fungus. Likewise, sugar content in the blood of the locust treated with radiated fungus reached 10 µg/l, when it was 40.9 µg/l in the blood of the control. Ovaries of locust females treated with radiated fungus were reduced in size (50 mm), compared to those of the control (82 mm).

Mites

M 1

SURVEY FOR SPIDERS IN NORTH SINAI, EGYPT. Gihan M.E. Sallam, Plant Protection Research Institute, 7 Nadi El-Seid Street, Dokki, Giza, Egypt, Email: Gihansallam2006@hotmail.com; Gihansallam2005@yahoo.com

This investigation is intended to shed light on the Egyptian spider fauna in North Sinai. Three localities were surveyed (El-Zaraniq, Airport area and El-Sheikh Zoweid region) from August 2003 to August 2005. The specimens were collected following two methods (plant shaking and receive the individuals on sieve-hand sorting). The specimen's identification was carried out by using a taxonomical key and comparison with identified specimens' collection in our Institute. Twenty three families were recorded, which represented by 24 genera and 18 species. The most dominant families were Araneidae, Agelenidae, Gnaphosidae, Mituregidae, Oxyopidae, Philodromidae, Salticidae, Scytotidae, Tetragnathidae, Theridiidae and Thomisidae. Whereas, the less dominant families were Dictynidae, Eresidae, Filistatidae, Hersillidae, Linyphiidae, Liocranidae, Lycosidae, Mimetidae, Oceobiidae, Pholcidae, Sparassidae and Zodariidae. *Argiope lobata* (Araneidae) and *Thomisus spinifer* (Thomisidae) were the most dominant species.

M 2

THE EFFECT MINERAL OIL ON *TETRANYCHUS URTICAE* UNDER LABORATORY CONDITIONS. Nahla Ali Ibrahim, Plant Protection Research Institute, Agriculture Research Center, Dokki, Giza, Egypt, Email: mamin2001@yahoo.com

The side effect of Mineral Oil (Antistress) on immature and adult stages of *Tetranychus urticae* Koch under laboratory conditions was investigated. *T. urticae* was collected from heavily infested cotton plant leaves. All discs were sprayed with five concentrations of mineral oil (350, 750, 1500, 3000 and 5000 ppm) and kept in an incubator at 26°C and 90% RH. Result indicated that all mineral oil concentrations were highly effective on adult and immature stages. The immature stage was highly sensitive after six days with a mortality rate of 98.05% when mineral oil was used at 5000 ppm. While the mortality rate of the six days adults was 91.81%, when mineral oil was used at the same concentration.

M 3

RELEASE OF *PHYTOSEIULUS MACROPILIS* (BANKS) TO CONTROL *TETRANYCHUS URTICAE* KOCH IN A STRAWBERRY FIELD. M.H. Mowafi¹ and A.A. Ebrahim². (1) Zoology and Nematology Department, Faculty of Agriculture, Al-Azhar University, Egypt; (2) Plant Protection Research Institute, Agriculture Research Center, Cairo, Egypt, Email: mowafimostafa_6@hotmail.com

The predatory mite *Phytoseiulus macropilis* (Banks) (Acari: Phytoseiidae) was released in an open strawberry field at Ismailia Governorate to control the two-spotted spider mite, *Tetranychus urticae* Koch. (Acari: Tetranychidae). A single release of the predator was applied at the rate of about 5 individuals per hole early or late in the season from 14 November to 14 April, 2000. Reduction of *T. urticae* population in the early release reached around 60%, 4 weeks after the predator release, then increased to around 90%, 7 weeks after predator release and reached 100% on the last inspection. Reduction of the pest population in the late release was around 60% in the experimental plots, five weeks after the predator release, and reach 84% on the last inspection. Releasing the predatory mite on strawberry indicated the possibility of controlling the *T. urticae* in the open strawberry fields by releasing the predatory mite early in strawberry season; when the pest population is low to provide the predator a chance to play its role successfully.

M 4

EVALUATION SOME COTTON VARIETIES FOR THEIR RELATIVE SUSCEPTIBILITY TO SPIDER MITE *TETRANYCHUS URTICAE* KOCH INFESTATION. Hassan A. Taha¹, M.R. Abbasy², M.H. Mowafi² and H. A. Azoz¹. (1) Plant Protection Research Institute, 7 Nadi Al-Said Street, Dokki, Giza, Egypt; (2) Faculty of Agriculture, Al-Azhar University, Cairo, Egypt, Email: marim_elsanady@yahoo.com

Field and laboratory studies were carried out during 2002 and 2003 to evaluate four cotton varieties (Giza 80, Giza 81.83, Giza 83 and Giza 90) for their relative susceptibility to spider mite *Tetranychus urticae* Koch. (Acari: Tetranychidae) infestation. Statically analysis of the results obtained showed that there were highly significant differences among cotton varieties and level of infestation, whereas, field studies on developmental stages and fecundity of spider mites as influenced by leaf constituents and histology revealed

that "Giza 80" was the most susceptible to spider mite infestation, while "Giza 83" was highly resistant, but "Giza 81.83" and "Giza 90" were intermediate in their relative susceptibility to spider mite infestation.

M 5

BIOLOGICAL STUDIES ON TWO ACARINA PREDATORS WHEN FED ON THE GRAIN MITE *TYROPHAGUS PUTRESCENTIAE* (SCHRANK). Mariam Abd El-Rahman El-Sanady, Plant Protection Research Institute, ARC, 7 Nadi El-Seid Street, Dokki, Giza, Egypt, Email: marim_elsanady@yahoo.com

Biological studies were carried out on two predatory mites *Lasioseius sewai* and *Blattisocius keegni* (Acari: Ascidae) under laboratory conditions of constant 25°C and 60-65% RH to study the biological aspects, fecundity and life cycle parameters. Results obtained showed that both predators pass through the egg- larva- protonymph- deutonymph adult male and female stages, and the life cycle lasted 9.4 and 10.8 days for the predatory mites *L. sewai* and *B. Keegani*, respectively. Female pre-oviposition, oviposition and post-oviposition periods lasted 2.6 and 2.1, 35 and 20, and 6.1 and 2.0 days, and deposited an average of 33.2 and 25.0 eggs with a daily rate of 0.9 and 1.3 eggs for the two predators, respectively. Females of *L. sewai* destroyed three times more prey than females of *B. keegni*, as they consumed 104.4 and 31.8 preys during female life span with a daily rate of 1.9 and 0.9 preys, respectively.

M 6

BIOLOGY OF THE SPIDER *STEATODA TRIANGULOSA* (WALCKENARE) FED ON BALLWORM LARVAE *PECTINOPHORA GOSSYPILLA* (SAUND). M.H. El-Erksousy and Reda A. Mohamed, Plant Protection Research Institute, Agriculture Research Center (ARC), 7 Nadi El-Seid Street, Dokki, Giza, Egypt, Email: marim_elsanady@yahoo.com

The spider *Steatoda triangulosa* (Walckenaer) (Araneida: Theridiidae) was reared on the pink bollworm *Pectinophora gossypilla* (Saund) (Lepidoptera: Gelechiidae) larvae at 22±2 °C and 50-60% RH. Average duration of the life cycle of female and male (egg and five spiderlings) was 130.8 and 126.4 days, duration from egg to adult stage was 179.1 and 167 days, and the generation time was 307.4 and 299.4 days for the females and males, respectively. The total consumption of *P. gossypilla* larvae was 326.6 and 202.8, and the adults remained alive without feeding for 23.6 and 11.6 days for females and males, respectively.

M 7

RELEASE OF THE PREDATOR *PHYTOSEIULUS MACROPILIS* (BANKS) ON KIDNEY BEAN PLANTS TO CONTROL *TETRANYCHUS URTICAE* KOCH IN DIFFERENT SEASONS IN EGYPT. I.H. Heikal, Central Laboratory of Organic Agriculture, Agriculture Research Center, 9 Jamaa Street, Giza, Egypt, Email: organic_agr@yahoo.com

The predator mite *Phytoseiulus macropilis* (Banks) (Acari: Phytoseiidae) was released on kidney bean plants to control the two-spotted spider mite (*Tetranychus urticae* Koch) (Acari: Tetranychidae) in different seasons under a screen-house at Dokki district (Giza Governorate). Winter season proved to be the best for predator release at the rate of 9, 6 and 3 individuals/ 2 plants. The spider mite population was greatly reduced, and reduction rate at the first post-count (after 2 weeks) was 100, 81 and 78% at the release levels of 9, 6 and 3 predators/2 plants, respectively. This might be attributed to the low spider mite population, due to unfavorable low temperature, which allowed the predator to suppress the pest population. Spring and autumn seasons were also suitable for population increase of the predator species. This resulted in controlling the red spider mite population especially at the high release level (9 and 6 individuals/2 plants). On the contrary, high temperature during summer months stimulated spider mites population to rapidly increase causing severe deterioration to the bean the plants before giving chance to predator individuals to control the mite pest. Thus, this high temperature and the occurrence of hot spells during summer had certainly a negative effect on the predator activity.

M 8

EFFECT OF DIFFERENT TEMPERATURES ON THE BIOLOGY OF SILVER BROAD MITE *POLYPHAGOTARSONEMUS LATUS* (BANKS) ON POTATO. Luaay K. Al-Ani and Ibrahim J. Al-Jboory Department of Plant Protection, College of Agriculture, Abu Ghraib, Baghdad, Iraq Email: Luaay_kalani@yahoo.com

Silver broad mite, *Polyphagotarsonemus latus* (Banks) (Acari: Tarsonomidae) is considered to be one of the main potato pests in the last seven years in Iraq. This mite attacks, in addition to potato, many other vegetables and fruits. This investigation was conducted to study the effect of five different temperatures 15, 20, 25, 30 and 35±1°C on the biological parameters of fertilized and parthenogenetic females of broad mite under laboratory conditions. The results showed a significant impact of temperature on the life span of this mite when the duration of incubation, active and quiescent larval instars, pre-oviposition, oviposition, longevity, life cycle and generation was 6.25, 3.50, 2.38, 3.13, 4.69, 9.06, 12.13 and 14 days under 15°C for fertilized females, respectively, whereas the duration of these parameters were 6.44, 3.13, 2.13, 2.25, 4.88, 9.19 and 11.69 days for the parthenogenetic females, respectively. The duration of the biological aspects for fertilized females were 1.29, 0.57, 0.57, 0.14, 1.86, 3.36, 2.43 and 2.57 days, respectively under 35°C, whereas for parthenogenetic females were 1.13, 1.00, 0.19, 0.38, 1.25, 3.06 and 2.19 days, respectively. The highest number of eggs per day was 5 and 2.25 for the fertilized and parthenogenetic females, respectively under 35°C, while the lowest number of eggs for both females was 1.36 at 15°C. The highest total number of eggs was 11.57 at 25°C for fertilized females and 8.86 eggs at 30°C for unfertilized females. The lowest number of eggs per females was recorded at 15°C (7.75 eggs) for fertilized females and at 35°C (5.13 eggs) for unfertilized females. The hatching rate was highest (93.06 and 86.67%) at 35°C for fertilized and unfertilized females, respectively. As for the ratio of female to male, 30°C showed the highest ratio for females (84.33%) and lowest for males (15.67%). Whereas, at 20°C males were 39.80% and females were 60.20%. The sexual ratio (female: male) was 6.50:1 at 30°C and at 20°C the ratio was 2.10:1, which was the lowest sex ratio.

M 9

INTRODUCTORY READING OF EXTERNAL SYMPTOMS ON PLANTS INDICATING INFECTION WITH MITES. Rudinah Saleh Jabbour¹ and Ibrahim Aziz Sakr². (1) Directorate of Farming and Agricultural Reform in Lattakia - Jableh Farming Office, Email: a-raheb@scs-net.org; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria, Email: ibra4591@maktoob.com

Plants are attacked by pests which vary in type and damage and thus there is a need to control them and prevent their spread. The success of adopted procedures is based on correct diagnosis which represent half of the remedy. Diagnosis of early mite infestation in the field relies, on external symptoms which frequently resemble symptoms caused by other pests or due to environmental and physiological factors. This study focused on mite-specific symptoms which can distinguish them from other pest and guarantee accurate diagnosis and subsequent success of control procedures.

M 10

BIOLOGICAL CONTROL OF CITRUS BROWN MITE USING PREDATORY MITE, *NEOSEIULUS CALIFORNICUS* (MCGREGOR) (FAMILY: PHYTOSEIIDAE) ON CITRUS TREES. Gamal A. Ibrahim, Plant Protection Research Institute, Agricultural Research Center, Dokki, Giza, Egypt, Email: shaaban59@yahoo.com

The citrus brown mite, *Eutetranychus orientalis* (Klein) (Family: Tetranychidae) is considered one of the important mite pests attacking citrus trees causing serious damage to leaves and fruits especially during the last three seasons (2000-2003). To enhance the exportation of citrus fruits and reduce the application of pesticides, this study evaluated the use of phytoseiid mite, *Neoseiulus californicus* as biocontrol agent for this dangerous mite pest on citrus trees. The predator was reared on the two-spotted mite, *Tetranychus urticae* Koch and released at three levels 40, 50 and 70 individuals per tree at an infestation level of 4.64, 5.06, and 4.70 mites per leaf, respectively. The control treatment, where no predator was released, has an infestation level of 4.69 individuals/leaf. After releasing the predator mite, the mite pest (*E. orientalis*) population generally declined gradually and reduction rate in the population of

pest mite four months after the release of the predator reached 57.84, 73.76 and 88.25%, respectively. The above mentioned results indicated the possibility of controlling the citrus brown mite, on citrus trees by releasing the predatory mite, *N. californicus*, at the rate of 70 predators per tree without any damage on leaves, resulting in good production without applying chemical acaricides.

Fungal Diseases

F 1

FIRST RECORD OF *CONIOTHYRIUM OLIVACEUM* ON OLIVE SEEDLINGS IN SYRIA. Mustafa Bellar and M. Beller, Bellar's Plant Protection Center, Hamidiyeh, Said Ali, Kasyoun, P.O. Box 10444, Aleppo, Syria.

A disease on olive trees was observed in 1998, 1999, 2000 and 2001 at nurseries and fields of olive trees in Edleb, Aleppo and Hama governorate in northern Syria. Symptoms were mainly withering and chlorosis of leaves and twigs which developed with time to stem canker, twigs blight and die-back. Infection typically occurred at the stem of young green shoots. On susceptible olive trees, these infections change to spindle-shaped stem swellings. Cankers occur annually and are spread along the stems. In cases of severe infection, epicormic shoots are produced on the stem around the spindle-shaped swellings and the top of trees begin to die. The symptoms were severe on 1-10% of seedlings and mild on over 48% of the seedlings. Disease incidence was 5.75, 4.47 and 3.87% in Hama, Edleb and Aleppo provinces respectively. Laboratory studies on the isolated fungi, including general features of fungal colonies, pathogenicity tests on some of the isolated fungi as well as the measurements of fungal propagules suggested the involvement of 9 fungi in the disease syndrome. The pathogenicity of the above mentioned fungi proved that *Coniothyrium* and *Hendersonia* which caused stem canker and twigs blight and appearance of typical symptoms of canker on the tested trees (85 and 75%) respectively, were the causal agents of olive trees canker in northern Syria. Other fungi were also found associated with the stem canker and twigs blight of olive trees. This report is the first record of *Coniothyrium olivaceum* and *Hendersonia* sp. on olive seedlings and trees in Syria.

F 2

VERTICILLIUM WILT OF OLIVE TREES IN ALGERIA: INCIDENCE AND CHARACTERISATION OF ALGERIAN STRAINS OF *VERTICILLIUM DAHLIAE* BY PCR ANALYSIS. M. Bellahcene¹, Z. Fortas², L. Belabid³ and M. Nicole⁴. (1) Département de Biologie, Faculté des Sciences, Université de Mostaganem, Email: belahcene_miloud@yahoo.fr; (2) Département de Biotechnologie, Faculté des Sciences, Université d'Oran; (3) Département de Biologie, Centre Universitaire de Mascara; (4) Unité Résistance des Plantes, Centre de recherché IRD-Montpellier, France.

Verticillium wilt, caused by the fungus *Verticillium dahliae* (Kleb), is a vascular disease affecting many plant species, including olive tree (*Olea europea* L.). In recent years, development and progression of verticilliosis attracted the concern of many farmers. Efforts were made in describing the symptoms and raising the importance of this pathogen in the visited rural communities. Analysis of samples of suspected trees attacked by verticilliosis showed that the frequency of infection with the pathogenic agent varied with the time of the year. In order to estimate the genetic diversity and to analyze the genetic structure of local strains of the cited fungi, several methods were used. The realized prospections in different olive trees fields in north Algeria gave us the possibility to identify the main locations of the *Verticillium* disease and to collect 32 isolates of *V. dahliae*. The number of samples used in our comparative study were 12 from France and 4 from Syria. Starting from an *in vitro* cultivated mycelium, which was filtered, lyophilized and the DNA was extracted and used for the molecular study. The ITS region of ribosomal DNA (rDNA) of representative isolates of *V. dahliae* were amplified by PCR using the universal primers ITS1 and ITS4. The size of the entire ITS region (ITS1- 5,8S -ITS2), was estimated to be about 550 pb, for all the tested isolates. The use of the PCR amplification with two specific primers showed that all samples were characterized by being of the none defoliating pathotype (ND). RAPD technique revealed a weak polymorphism between isolates of *V. dahliae*. The average genetic diversity was 7.05% and the analyses of genetic structure concluded that isolates from Algeria samples were highly homogenous. The sequencing and alignment of the ITS sequence of V6 isolate gave 100% of similarity with the reference strain.

F 3

THE PRESENCE OF A PHYTOTOXIC SUBSTANCE IN *OLEA EUROPAEA* L. LEAVES CONTAMINATED BY *SPILOCAEA OLEAGINEA*. Abdelhadi Guéchi and Samia Mezaache, Laboratory of Microbiology and Phytopathology, Faculty of Sciences, University Ferhat ABBAS, 19000, Setif, Algeria. Email: guechi.abdelhadi@caramail.com

Olive is one of the important crops in Algeria, which is seriously affected by peacock leaf spot disease caused by *Spilocaea oleaginea*. In this study, a phytotoxic substance was extracted from infected leaves, as

well as from different fungak extracts, six monthes after the fungus was cultured. Production of this fungal substance depended on source of carbon, nitrogen and temperature. Concentration of the phytotoxic substance in leaves increased with the development of the disease and reached the maximum when infected leaves changed their color to yellow and dropped.

F 4

OLIVE TREE VERTICILIOSIS IN MOROCCO: DISTRIBUTION, GENETIC DIVERSITY OF THE PATHOGEN AND EVALUATION OF THE RESISTANCE OF SOME VARIETIES. Sedra My Hassan¹, Khadija Lachqer² and Souad Nour³. (1) Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech, INRA–Marrakech Morocco; (2) Faculty of Sciences Semlalia, University Cadi Ayyad, Marrakech, Morocco; (3) Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech INRA –Marrakech, Morocco.

In Morocco, the olive tree verticiliosis caused by *Verticillium dahliae* is already distributed in numerous areas at different infection levels. The epidemiologic study of the disease conducted in the Haouz area revealed an important geographic distribution of the disease with a great variation in incidence (0 to 100%). In fact, among 15 visited farming locations, 10 were contaminated. The high prevalence of disease foci and incidence were recorded in the area of Tamellalet. In addition, the study allowed identifying the main factors of disease development in the area. The risk was higher when the trees were young, dense, well irrigated, when associated with other crops and did not make good use of nitrogen fertilizer. The appreciation of aggressiveness level of different isolates showed a high diversity and instability in its pathogenicity. The genetic diversity analysis of pathogen population from the Haouz area, using vegetative compatibility and molecular techniques showed that diversity was limited. Only 3 groups of vegetative compatibility (VCGs) and 4 RAPD groups were determined. The majority of isolates was assigned to one group in the case of VGC or RAPD. Moreover, genetic links between GCVs and RAPD groups were established. No relationship was found between RAPD groups or VGCs, botanic and geographic origin and aggressiveness level of the isolates. The results of resistance evaluation of some varieties showed that significant differences of their reaction with the disease existed under laboratory conditions. Numerous Moroccan varieties were susceptible and Languedog variety was resistant. Some plants from seeds of wild olive trees showed resistance towards the disease.

F 5

USING PCR FOR THE DETECTION OF VERTICILLIUM DAHLIAE, THE CAUSAL AGENT OF OLIVE WILT. Huda Haziem Al-Taae and Ali Kareem Al-Taae, College of Agriculture and Forestry, Mosul University, Iraq, Email: htaae@yahoo.com, aaltaae@yahoo.co.uk

Thirty one isolates of *Verticillium dahliae* kleb. collected from olive trees in Ninevah province, Iraq, were identified by Polymerase Chain Reaction (PCR) using pair of primers FVD and RVD specific for the detection *V. dahliae* and FVA and RVU for *V.albo-atrum*. Results showed that all isolates were *V. dahliae*. The primer pairs FVD and RVD amplified the expected band size (330 bp) and no bands were produced by using the primer pairs FVD and RVU, suggesting that *V. albo-atrum* is absent.

F 6

EPIDEMIOLOGY AND CONTROL OF POWDERY MILDEW (*PODOSPHAERA LEUCOTRICHA*) ON APPLES IN JORDAN UPLANDS. Hifzi Abu-Blan and Assad Abdel- Rahman, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: hifzi@ju.edu.jo

A study was conducted to evaluate the epidemiology and effectiveness of different fungicides on suppression of powdery mildew infection on apple in the main upland regions in Jordan during the period April 2002 – May 2003. Two apple cultivars namely Golden Delicious and Starking grown in six locations were used in this experiment. Apple growth stages, symptoms of primary infection, incidence, severity and seasonal development of the disease were monitored during this investigation. Pathogen inoculum sources and overwintering structures and their viability were investigated. Also six different fungicides were tested for their efficacy to control powdery mildew. Meteorological data revealed different patterns of disease development. Symptoms of primary infection appeared first in April in areas of relatively warmer weather,

and appeared last in May in the coldest location. Results showed that *Podosphaera leucotricha* was found between bud scales in August and remained viable during the winter season. *Cleistothecia*, the sexual stage of the fungus, was also reported for the first time in Jordan. Results of chemical control showed that all tested fungicides had the capability to reduce disease development significantly compared to control. Systhane and Bayfidan were the most effective fungicides resulting in the reduction of disease incidence to 16.1 and 17.4%, respectively, when used at the recommended rates.

F 7

INDUCTION OF SYSTEMIC ACQUIRED RESISTANCE AGAINST FIRE BLIGHT DISEASE OF APPLE CAUSED BY *ERWINIA AMYLOVORA*. M.A.A. Sallam, K.A. Abo-Elyousr and M.H.A. Hassan. Department of Plant Pathology, Faculty of Agriculture, Assiut University, Assiut, Egypt, Email: amnsallam@yahoo.com

The effect of Bion, *Rahhnella aquatilis* (Ra39) and BioZell-2000 B against apple fire blight disease caused by *Erwinia amylovora* were evaluated as a possible alternative to streptomycin. In vitro studies, using agar diffusion test, there was no direct effect of Bion, *Rahhnella aquatilis* (Ra39) and BioZell-2000 B on the pathogen growth. Under greenhouse conditions, Application of Bion, *Rahhnella aquatilis* (Ra39) and BioZell-2000 B on foliage of M26 rootstock reduced severity of disease up to 82, 69 and 59%, respectively. Further field studies of all tested resistance inducers (Bion, BioZell-2000 B and Ra39) to apple plants resulted in reduction of infection of blossom blight up to 21, 29 and 55%, respectively. In physiological studies, enhanced activities of the defense-related enzymes, PR-Proteins (chitinase and β -1,3 glucanase) and phenolic compounds were detected which are well known biochemical markers for systemic acquired resistance.

F 8

A SURVEY FOR APRICOT WILT DISEASE IN DAMASCUS-GHOTA, SYRIA. Mohamad Nazir Mouseli, M.H. Safia, O. Kutifani and A. Nehlawi, GCSAR, Douma, P.O. Box 113, Damascus, Syria, Email: m.mousliuf@swissinfo.org

This study was conducted in eastern Ghota in Damascus province during 1997 and 1998, aimed to survey and identify the causal agent of wilt and dryness phenomenon on apricot trees and to determine the rate of infection and disease severity in growing orchards. Sixteen villages were surveyed with a total area of 711 hectares. 115 samples from infected stems were collected and fungi were isolated on PDA media. 60% of the isolates were found to be *Verticillium dahliae* and 2-8% of other fungi. Artificial inoculation with *Verticillium dahliae* suspension was made. Wilting symptoms were observed 20 days after seed germination. The wilt pathogen was reisolated from seedlings on PDA media which confirm the occurrence of *Verticillium dahliae*, as the causal agent of wilting.

F 9

EFFICIENCY OF DIPPING IN HOT WATER OR ETHANOL ON REDUCING POST HARVEST FUNGAL DECAY OF PEACH FRUITS. Azzeddin M.Y. Alawami, Plant Protection Department, Faculty of Agriculture, Omar Al-Mukhtar University, El-Beida, Libya, Email: Azzawami2002@yahoo.com

Dipping peach fruits inoculated with each of *Botrytis cinerea* or *Rhizopus stolonifer* in hot water or 10% ethanol at 46 or 50°C, significantly decreased decay development as compared to control. The least infection rate was obtained by dipping inoculated peach fruits in 10% ethanol at 50°C for 2.5 min. Scan Electron Microscope examinations showed that hot water at 50°C or 10% ethanol at 46°C caused non-uniform growth of both *R. stolonifer* and *B. cinerea*. Hyphae of *R. stolonifer* was crinkled and lost its turgor, whereas mycelial mat of *B. cinerea* was thin due to markedly reduced branching. In addition, treatment with 10% ethanol at 50°C greatly reduced spore germination of both fungi tested. Heat treatment of fruits inoculated with the two fungi resulted in reduction of fruit weight loss compared with control. Immersion of inoculated fruits in hot water or 10% ethanol at 46 or 50°C for 2.5 min. resulted in pH increase of juice, decrease of titratable acidity and reduction of soluble solids content as compared with control fruits. Moreover, all treatments, except hot water at 46°C, significantly decreased total phenolic compounds content and increased total soluble and non reducing sugars. On the contrary, reducing sugars content was

not significantly affected by heat treatment. Heat treatments with 10% ethanol at 46 or 50 °C of fruits inoculated with the fungi tested resulted in marked reduction in the enzyme pectin methyle esterase, polymethyl galactronase, polygalactronase, cellulose, polypheno oxydase and peroxidase activities, compared to control fruits or fruits treated with hot water at 46 or 50°C.

F 10

PROTECTION METHODS FROM POST-HARVEST FUNGI ON APPLE. A. Sidawi¹, S. Alchaabi¹ and J. Faddoul². (1) General Commission of Scientific Agricultural Research, P.O. Box 113, Douma, Damascus, Syria, Email: ramakot94@maktoob.com; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, Damascus, Syria.

This study was carried out to evaluate control methods of Post-harvest pathogens on apple fruits (Golden Delicious and Starckening) at two agricultural research stations (Swaida and Surghaia), during two seasons (1998/1999 and 1999/2000). In the first experiment, trees were sprayed one month before harvest with Benomyl, Thiophanate methyl, Iprodione, and running water. In the second experiment, apple fruits were dipped before storage in the above-mentioned fungicides and running water. In both experiments, untreated apple fruits were used as check. In addition, effects of dipping previously used boxes (Plastic, Polystyrene, Wood, and Carton) in formaline (1%) compared with boxes dipped in water on the development of post-harvest decays on apple fruits were evaluated. In the forth experiment, apple fruits were dipped in a suspension of each of two species of bacteria (*Citrobacter* sp. and *Shewanella putrefaciens*) and one species of yeast isolated from apple fruits' surface, or in running water, Benomyl, and parafine oil before storage. The effects of these treatments on the development of post-harvest decays were tested using untreated fruits as control. Fruits in all experiments were stored in chilled and non-chilled stores, except in case of the previously used boxes which were stored in chilled stores only. Results showed that spraying the trees with all fungicides and running water significantly reduced post-harvest decays compared with control in chilled stores at both locations. However, in non- conditioned stores, at Swaida, spraying with thiophanate methyl had significantly reduced decays compared with other treatments. In Surghaia, Benomyl and running water have reduced decays significantly on Starking, whereas Iprodione gave the best result on Golden delicious. Dipping the fruits in running water, Iprodione, and Benomyl, had significantly reduced decays compared with other treatments at both locations, in chilled store, but not in non-chilled store. At Surghaia dipping in running water gave the best result. Dipping the boxes (Plastic, Polystyrene, and Wood) in formaline significantly reduced decays compared with dipping in carton and check boxes. The effect of bio-control agents using *Citrobacter* spp. was good compared with *S. putrefaciens* and yeast which gave moderate effect.

F 11

PATOGINICTYAND PHYTOTOXITY OF HENDERSONULA TORULOIDEA NATTRAS ON CITRUS TREES. Bassam Yahya Ibraheem and Nidhal Younis M. Al-Murad, Department of Plant Protection, College of Agriculture and Forestry, Mosul University, Iraq, Email: nidal1234567@yahoo.com

Isolation from orange trees infected with branch wilt showed the presences of *Hendersonula toruloidea* Nattras as potential pathogen. Seven fungicides were used *in vitro* by applying three concentrations (50, 100, 150 mg a.i/l). Results revealed that the fungicides caused significant mycelial growth inhibition. Based on a bioassay technique of *H. toruloidea* culture filtrate which includes wilting of young shoot cutting and inability to translocate water. It was clear that culture filtrate caused shoot cutting wilt after one day and complete desiccation after three days and this culture filtrate also caused water shortage in orange shoot cutting. Host range of *H. toruloidea* includes the following citrus species Lemon (*C. limon*), limetta (*C. limetta*), Sour Orange (*C. sinensis*), Grapefruit (*C. paradisi*) and Mandarin (*C. deliciosa*).

F 12

STUDY ON THE *ALTERNARIA* POPULATIONS VARIABILITY CAUSAL AGENTS OF CITRUS DISEASES IN NORTH OF IRAN, BASED ON MORPHOLOGICAL CHARACTERISTICS AND PROTEIN ELECTROPHORETIC PATTERNS. S.V. Alavi¹, A.A. Dehpour² and A. Majd³. (1) Plant Pests and Diseases, Mazandaran Agricultural Research Center; (2) Biology Department, Ghaemshahr Islamic Azad University; (3) Biology Department, Tehran-Shomal Islamic Azad University, Iran, Email: alavi_v@yahoo.com

Alternaria species cause four distinct diseases of citrus, namely *Alternaria* leaf spot of rough lemon, mancha failor on Mexican lime, *Alternaria* black rot of fruit and brown spot of tangerines and hybrids. The two diseases occur in north of IRAN. During 2003 and 2004, samples were collected from citrus trees with symptoms of black rot of navel oranges and brown spot of tangelos in various groves of mazandran. *Alternaria* colonies isolated from the collected samples were purified on PDA media. Although the colonies had different colours on PDA, their spore colour and mycelium width were similar. The isolates obtained from fruits had larger spore size (28x13 µm) in comparison with the others. SDS-PAGE was carried out and the protein bands were analysed by using total lab 200 and spss/pc softwares. No significant differences were observed between the protein band numbers and origin of *Alternaria* isolates, except the fruit isolates that had maximum bands on the gel. Based on the results obtained all of *Alternaria* isolates were identified as *A. alternata* based on morphological traits, but they can probably separated to sub species based on the pathogenicity and host range. The fruit isolates differed and they probably belong to an other species.

F 13

THE CAUSAL AGENT OF GRAPEVINE DIEBACK IN JORDAN. Ahmad Al-Momany, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: momanyah@ju.edu.jo

Dieback of grapevine branches is becoming increasingly important in Jordan and is very common in old vineyards. This study was conducted during 2001 and 2002 growing seasons in naturally infected fields. Twenty nine vineyards older than 7 years were chosen in Ajloun province. The disease symptoms, which were most evident during early March when the newly grown shoots were 15-20 cm long, were deformed and discolored. Young leaves were smaller than normal, cupped and developed tattered margins. Bunches on affected shoots showed a mixture of large and small berries and ripened unevenly. Across section of an infected cordon showed a dead brown tissue of wedge shape. The disease incidence was in the range of 5-75% and disease severity ranged from 9.5 to 23% in the studied vineyards. *Eutypa maura* (Fr.) Sacc. was isolated from decayed wood of diseased grapevine for the first time in Jordan. Perithecia with ascospores were found on stromatic tissue on the surface of dead wood and collected from old pruned branches during April. Ascospores were allantoids in shape, orange-yellow in color, and 7.6-12.8 µ in length and 1.9-3.8 µ in width.

F 14

DETECTION OF AFLATOXIN IN *ASPERGILLUS* SPECIES ISOLATED FROM PISTACHIO IN IRAN. B. Sharifnabi, P. Rahimi and M. Bahar, College of Agriculture, Isfahan University of Technology, Isfahan, Iran, Email: sharifna@cc.iut.ac.ir

Aflatoxins are the most serious problem in the production and export of pistachio in Iran. Pistachio is susceptible to invasion by aflatoxicogenic *Aspergillus* species and subsequent production of aflatoxins, during preharvesting, processing, transportation or storage. Conventional methods for the detection of these toxins in pistachio include different methods of chromatography such as TLC and HPLC, that are time consuming, labor-intensive and expensive. PCR methods are more rapid and precise for the identification of aflatoxicogenic fungi. In this study, nut samples were collected from pistachio orchards in Kerman, Rafsanjan and Isfahan. AFPA and PDA media were used to isolate *Aspergillus* species. Two hundred and fifty isolates were obtained and used for further study. These isolates belonged to *Aspergillus*, *Fusarium*, *Rhizopus*, *Alternaria* and *Cladosporium* species. Microscopic and macroscopic characters of *Aspergillus* species were observed on CYA, CY20S and MEA after one week. Out of 200 isolates, ten *Aspergillus* species were identified as, *A. alliaceus*, *A. candidus*, *A. flavus*, *A. niger*, *A. niveus*, *A. ochraceus*, *A. parasiticus*, *A. tamari*, *A. terreus*, *A. unguis* and *A. wentii*. The species *A. alliaceus*, *A. candidus*, *A. niveus*, *A. unguis* and *A. wentii* are reported for the first time from Iran. The target genes, named *aflR*, *aflJ* and *omtB*

were used, but the *omtB* primer used by Yu (2000) did not be amplify the target genes, and a new degenerate primer was designed and called *omtBII*. This primer was able to amplify target sequences in all aflatoxicogenic isolates in this study. Application of *omtBII* primer gave the same result obtained by TLC analysis, and according it is a suitable tool for the detection of aflatoxicogenic isolates. Application of methylated β -cyclodextrin in culture media showed that it can be used as a rapid method for the detection of aflatoxicogenic fungi. But, because of the unknown nature of aflatoxin production in different situations, a PCR specific primer is a reliable method for detection of aflatoxicogenic isolates.

F 15

FIRST ISOLATION AND CULTIVATION OF THE FUNGUS AND THE ALGA OF THE LICHEN *XANTHORIA PARIETINA* INFECTING MANGO TREES IN EGYPT. Ali M. Koriem, Efficient Productivity Institute Zagazig University, Egypt.

The lichen *Xanthoria parietina* is the most abundant lichen species infecting Mango trees, especially in neglected orchards in Egypt. The harmful effect of epiphytic lichens, as one of plant pathogens, on higher plants especially trees was demonstrated in recent years. The fungus and the alga of the lichen *X. parietina* were isolated and cultivated in this study for the first time in Egypt. Different methods of isolating the fungus and the alga of that lichen were used. The best method for isolating the fungus was by means of the discharged spores from the ascocarp, while the micropipette technique was the best for isolating the alga. To culture the isolated fungus and alga, different media were used. Soil-extract followed by Lilly and Barnett were the best media for the fungal growth, and the maximum growth of the alga was observed in the liquid Bold's basal mineral medium + tree branches extract followed by Bold's basal mineral medium + protease peptone. Factors affecting spore germination and growth rate of both fungus and alga i.e. temperature, pH and light intensity were also studied.

F 16

SURVEY AND IDENTIFICATION OF MYCOFLORA ASSOCIATED WITH DISEASE CONDITIONS WHICH AFFECT SHRUB TREES AND SEEDLINGS OF FOREST PLANTATIONS AND EUCALYPTUS IN NORTHERN SYRIA. Mustafa Bellar and Mazen Bellar, Bellar's Plant Protection Center, Hamidiyeh, Said Ali, Kasyoun, P.O. Box 10444, Aleppo, Syria.

Disease conditions of shrubs trees and seedlings of forest plant species from different families and Eucalyptus were monitored during 1989 to 2002 at nurseries and forests in Idleb, Hama and Aleppo provinces, and along road sides in Homs, Lattakia, Aleppo, Kamishly. Symptoms observed were mainly withering and chlorosis of the leaves which developed with time to twigs blight and die-back. The symptoms were severe on 10-25% of seedlings, shrubs and trees. Laboratory studies on isolated fungi, including general features of fungal colonies, pathogenicity tests on some of the isolated fungi, and biometric measurements of fungal spores suggested the involvement of 48 fungi in the disease syndrome. The majority of the fungal pathogens belong to the following genera: *Coniothyrium* (86.15%), *Mycosphaerella* (52.31%), *Sphaeropsis* (*Diplodia*) and *Alternaria* (47.69% each), *Cytospora* (40%), *Pestalotiopsis* (38.46%), *Phoma* (33.65%), *Hendersonia* (32.31%), *Pleospora* (30.77%), *Gloeosporium* (27.69%), *Teichospora* (20%), *Cladosporium* (16.92%), *Cylindrosporium* (15.38%), *Ascochyta*, *Macrophomina* (*Rhizoctonia bataticola*) and *Stagonospora* (12.3% each), *Stemphylium* and *Colletotrichum* (9.23% each), *Aureobasidium* (7.69%), *Oidiopsis* and *Oidium* (6.15%) and other 25 fungi (1.54-7.69%). In northern Syria, Eucalyptus was subject to attack by several diseases, associated with several fungal pathogens. An example of these diseases were: leaf and stem spot (*Alternaria*, *Ascochyta*, *Cladosporium*, *Cercospora*, *Pestalotiopsis* and *Phaeoseptoria eucalypti*) canker die-back and leaf spot (*Coniothyrium*, *Hendersonia*, *Mycosphaerella*, *Phoma* and *Seiridium* (*Coryneum*)), anthracnose (*Gloeosporium*) and *Cytospora* canker. The pathogenicity of the above mentioned fungi proved that *Coniothyrium* which caused stem canker and twigs blight and appearance of typical symptoms of canker on the tested trees (100%), was the causal agent of Eucalyptus canker in northern Syria.

F 17

HEART ROT DISEASE ON DATE ON PALM CULTIVARS IN THE COASTAL REGION OF LIBYA. Awatef M. El-Rayani¹, Najat K. El-Gariani² and Elzaroug A. Edongali². (1) Date Palm and Olive Improvement Program, Libya; (2) Plant Protection Department, Faculty of Agriculture, Al-Fateh University, Libya, Email: a3aia@hotmail.com

To study the heart rot disease distribution on different date palm cultivars, visits to 62 farms in 23 date palm regions in Libya coastal region were conducted during 2004-2005. This disease was found in Zleten, Musrata, Tawega, Khumes, Al-Zawia, Summan. High incidence was found on Bekrari, Taboni, Helawi, Fezani and Ammi cultivars. Disease symptoms were found associated with young trees and high relative humidity. The infection was found mainly in the regions where water was applied by sprinkler irrigation. The disease symptoms were characterized by leaf discoloration of the apical bud, which changed later to brown and brittle, stop growing and the apical bud becomes rotten. The laboratory examination of all collected samples indicated that the fungus *Thielaviopsis paradoxa* was associated with these symptoms.

F 18

RECENT DISTRIBUTION OF THE BAYOUD DISEASE OF DATE PALM IN NORTH AFRICA AND REMARKS ABOUT ITS CHARACTERIZATION AND DIAGNOSIS. Moulay Hassan Sedra, Regional coordinator of Bayoud project- Arab Organization for Agricultural Development (AOAD), Director of Researches, Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech INRA, Marrakech, Morocco, Email: mhsedra@yahoo.fr, sedramh@menara.ma, sedramh@hotmail.com

Bayoud is incontestably the most serious and destructive fungal disease of the date palm (*Phoenix dactylifera L.*). It constitutes a variable plague in the date growing areas of North Africa and a threat to those countries free of it. The diversity of the situations in these countries imposes a diversity of control strategies against this disease. The diagnosis of the disease showed that it presents typical and atypical symptoms. Sometimes, the disease is expressed in association with other diseases on the same date palm. It was demonstrated that the fungus secretes toxins that distinguish it from other strains with the same species. Some strains of the pathogen, although they have different origin and colonies having different morphological and cultural features and molecular profiles, they are all pathogenic on date palm but with different levels of aggressiveness. The characterization of different strains isolated from soil, date palm, Canary Island palm and plants that are healthy carriers, permitted to have evidence for this diversity. This triggered some questions on the origin of the disease and to open future applied.

F 19

STUDY OF DATE PALM LEAF SPOT DISEASE IN BASRAH, IRAQ AND THE REALTION OF AGE OF PALM AND WAX CONTENT WITH INFECTION. Mohammed A. Fayad and Alaa. O. Mania, Plant Protection Department, College of Agriculture, University of Basrah, Iraq, Email: m_a_fayadh@yahoo.com

This study was carried out in the College of Agriculture, University of Basrah for the evaluation of leaf spot disease severity on different date palm cultivars (Barhee, Breim, Hilawii, Sayer, Zahdi and Khadrawi) in three regions of Basrah city (Abul-Kasseb, Alhartha and Shatt-Al-Arabn). Results showed that the highest infection rate was in Shatt-Al-Arab region (37.33%) compared to Abul-Kasseb region (32.66%). Zahdi cultivar showed highest infection rate, which reached 44% in Shatt-Al-Arab region, compared to Barhee and Khadrawi cultivars which reached 28% in Abul-Kasseb region. It was also evident that the infection rate increased with increasing palm age; it was lowest in the 10 years old trees (28%), while the highest rate was observed in the 30 years old trees (44%). *Alternaria alternate*, *Bipolaris australiensis*, *Cladosporium herbarum*, *Fusarium oxysporum*, *F. solani*, *Phoma leveillei*, *Phoma glomerata* and *Thielaviopsis paradoxa* were isolated from spotted leaves. These fungi produced typical leaf spot symptoms of date palm leaf when tested in the laboratory. Fungi like *A.alternata*, *B. australiensis*, *F. oxysporum*, *F. solani*, *Phoma leveillei* and *P. glomerata* were recorded for the first time as causal organisms of leaf spot disease on date palm in Iraq. Leaf extracts of Khadrawi and Barhee cultivars reduced fungal radial growth to 2.8 and 2.9 cm, respectively, whereas Sayer and Zahdi leaf extracts enhanced the radial growth up to 5.4 cm for each compared with 3.4 cm in the control treatment (W.A). The results indicated that there was

significant difference among cultivars' leaf extract in there tannin and wax content. Negative correlations between tannin and wax content in the leaves and severity of infection were recorded.

F 20

A PRELIMINARY STUDY ON SPREAD OF DATE PALM PESTS IN IRAQ. Ismail I. Al-Yaseri, Ahmmad Z. Ismail and Aseel A. Mohammed, State Board of Plant Protection, Abu-Ghraib, Baghdad, Iraq, Email: ismail_alyaseri@yahoo.com

A Survey was carried out during the second half of 2005 to identify diseases in date palm in 13 governorates (Basrah, Misan, Thigar, Dewaniya, Samawa, Babylon, Kerbela, Najaf, Wasit, Baghdad, Diyala, Salah-Alddin and Al-Anbar) in Iraq. The results showed that diseases occurred in 8.56% of Iraqi groves and caused by different pathogenic agents. Kerbela governorate had the highest incidence (35.41%), followed by Thigar (32.5%), Salah-Alddin (26.27%) and Babylon (25.9%). The observed symptoms included 34.7% fronds distortion, 74.6% fronds drought, 28.4% tip drought, 29.6% twisted tip and 24.4% of other cases such as inflorescences rot, borers, dubas bugs, termites...etc. Crop management was bad in 23.8% of the groves, good in 64.7%, very good in 10.3% and excellent in 1.2%. The most common age group was the 20-30 years old palm trees, followed by the 30-40 years old (16.05%), 10-20 years old (14.6%). The pest managed groves were 50% of the surveyed groves. The incidence of the observed symptoms on the date palm varieties showed that cv. Zahdi had 38.73% of these cases, Khadrawi 17.8%, Osta Omran (Omrani) 12.4% and Khastawi 7.17%. The isolation and diagnosis of pathogenic agents showed the frequent occurrence of the fungi *Thialoviopsis paradoxa* (normal and clustered types), and some of *Fusarium* species, the most important was *Fusarium solani* which was responsible for the wilt that started with gradual yellowing that reached the palm tip followed by quick death.

F 21

COTTON SEEDBORNE FUNGI AND THEIR EFFECT ON INCIDENCE OF COTTON SEEDLING DECLINE. A.A. Aly, M.T.M. Mansour, I.H. El-Abbasi, A.A. El-Wakil and S.M.E. Zayed. Plant Pathology Research Institute, Agriculture Research Center, 9 Jamaa Street, Giza, Egypt, Email: Brhoomelabbasi_57@yahoo.com

Surface-sterilized and nonsterilized seeds from eight commercial cultivars of cotton (*Gossypium barbadense* L.) were examined for qualitative and quantitative estimates of seedborne fungi. The observed fungi were *Alternaria alternata*, *Aspergillus flavus* and *Aspergillus niger* (71%), *Aspergillus* spp., *Cephalosporium* sp. and *Cladosporium* sp. (25.63%), *Drechslera* spp., *Fusarium moniliforme*, *F. oxysporum*, *F. semitectum*, *F. solani*, *Fusarium* sp., *Nigrospora oryzae* and *Penicillium* spp. (34%), *Rhizoctonia solani*, *Rhizopus stolonifer*, *Trichoderma* spp. and *Trichothecium roseum*. Other fungi occurred at frequencies ranged from 0.13 to 22.50%. The isolation frequencies of *A. niger*, *Cephalosporium* sp., *Cladosporium* sp. and *T. roseum* were significantly decreased by seed treatment, while the isolation frequencies of the other fungi were not affected. Cultivar and cultivar x treatment interactions were the major sources of variation in the isolated fungi except *F. oxysporum*. Cultivar was the most important source of variation in six (40%) of the isolated fungi, while cultivar x treatment interaction was the most important source of variation in five (33.33%) of the isolated fungi. The highest number of fungi (14) was associated with Giza 70, whereas the lowest number (9) was associated with Giza 85. The present study showed that the role of seedborne fungi of cotton, as seedling disease incitants, was more evident in the pre-emergence stage compared with the post-emergence stage. Pearson correlation coefficient was calculated to evaluate the degree of association among 153 pairs of the isolated fungi. Eleven of the fungal pairs (7.19%) were significantly associated. Out of the 11 pairs, 9 were positively correlated, and 2 were negatively correlated. No significant correlations were found in the remainder fungal pairs. Cluster analysis divided the isolated fungi into two distinct groups. The first group included *A. alternata*, *A. flavus*, *A. niger*, *Cephalosporium* sp., *Cladosporium* sp., *Drechslera* spp., *F. solani*, *F. moniliforme*, *F. semitectum*, *Fusarium* sp., *Penicillium* spp. and *Trichoderma* spp., whereas the second group included *Aspergillus* spp., *F. oxysporum*, *N. oryzae*, *R. solani*, *R. stolonifer* and *T. roseum*. Within each group, fungi were correlated strongly and positively, whereas between groups, fungi were correlated weakly or negatively. This result implies the potential existence of cultivar related groups of fungi. Four regression models, derived from stepwise multiple regression analysis, were constructed to describe the effect of the isolated fungi

(independent variables) on seedling disease variables (dependent variables). These models showed that differences in seedling disease variables were largely due to the effects of *F. semitectum*, *N. oryzae*, *R. solani*, *R. stolonifer*, and *Trichoderma* spp. No regression model was constructed to predict post-emergence damping-off, which reconfirms that soilborne fungi of cotton are more important, as seedling disease incitants.

F 22

STUDIES ON THE COLONIZATION OF SUNFLOWER PLANTS BY A GFP-EXPRESSING *PHOMA MACDONALDII* STRAIN. T. Abou Al Fadil¹, A. Jauneau², M. Petitprez¹, M. Rickauer¹, Y. Martinez², R. Darvishzadeh¹, G. Dechamp-Guillaume¹. (1) Department of Biotechnology and plant breeding BAP, INP-ENSAT, 18 chemin de Borde, Rouge, BP 31326 Castanet France, Email: tafadil@yahoo.com, taissir@ensat.fr; (2) IFR Pôle de Recherches en Biotechnologies Végétales, 24 chemin de Borde Rouge, BP42617 Auzeville, 31326 Castanet Tolosan, France.

Production of fluorescent proteins, notably of the green fluorescent protein (GFP), by transgenic bacteria or fungi, is a powerful approach to study colonization of the host by pathogenic micro-organisms. This technique was used to study the interaction between sunflower (*Helianthus annuus*) and *Phoma macdonaldii*, the causal agent of black stem disease. This fungus is responsible of necrosis on stem and collar. The disease causes large losses in sunflower production worldwide. We described for the first time *Agrobacterium tumefaciens*-mediated transformation of *Phoma macdonaldii* to introduce the *gfp* gene under control of a constitutive promoter. Transformants were selected on hygromycine-containing media, and 18 single-spore isolates were prepared. After checking pathogenicity of the transformants, one single-spore isolate was chosen to inoculate two lines of sunflower, one highly susceptible and one tolerant, and to study colonization of root and stem tissue by the fungus. Results obtained by confocal laser scanning microscopy and quantitative analysis as well as electronic microscopy observations showed significant differences in fungal penetration and colonisation, and disease development between the two sunflower lines.

F 23

NUTRIENT UPTAKE BY *PHYTOPHTHORA INFESTANS* HYPHAE IN VITRO. Najat Khalifa El-Gariani¹ and Peter Spencer-Phillips². (1) Plant Protection Department, Faculty of Agriculture, Al-Fatih University, Libya, Email: a3aia@hotmail.com; (2) Bioscience School, University of West of England, UK.

A protocol was devised to measure accumulation of ¹⁴C-labelled sugars by scintillation counting. Label was significantly accumulated by *Phytophthora infestans* hyphae from glucose more than from fructose or sucrose. Approximately 60% of the label led C in *P. infestans* was converted to ethanol insoluble components. *P*-chloro-mercuribenzenesulphonic acid (PCMBS) and carbonylcyanide-*m*-chlorophenylhydrazone (CCCP) inhibited uptake of the label from glucose by 55.3% and 78.1% respectively. Nigericin and fisetin inhibited uptake of the label from glucose by 15.9% and 78.7% respectively. Label from the glucose analogues 2-deoxy-D-glucose was accumulated by *P. infestans* hyphae less than that from glucose (63%). ¹⁴C from 3-O-methylglucose accumulated more than that from glucose (132%). Ethanol treatment almost completely removed label accumulated from 2-deoxy-D-glucose by hyphae, suggesting that it all remained soluble within the hyphal cytoplasm. Sodium azide significantly inhibited uptake of all sugars.

F 24

STUDY OF POWDERY MILDEW DISEASES IN NORTHERN IRAQ. R.Y. Al-Gorany and N.A. Ramadan, Biology Department, College of Sciences, Mosul University, Iraq, Email: ramadhgoran@yahoo.com

The field survey was conducted on the plants that grown in certain areas of Nineva, Erbil and Dohuk provinces. The study included wild plants, field crops, trees, shrubs, vegetables and ornamentals. The total number of plant species surveyed was 103; 34 species of wild plants, 32 species of trees and shrubs, 23 species of vegetables, 9 species of field crops and 5 species of ornamentals. 46 plant species were infected with powdery mildew; 16 species belong to the family *Asteraceae* (Compositae), 5 species of *Ammiaceae* (Umbelliferae), 4 species of *Poaceae* (Gramineae) and 3 species of each *Brassicaceae* (Cruciferae) & *Cucurbitaceae*, 2 species of each *Fabaceae* *Papilionaceae*, *Polygonaceae*, *Malvaceae* & *Rosaceae* and one

species of each of the following families: *Fagaceae*, *Dipsacaceae*, *Convolvulaceae*, *Vitaceae*, *Verbinaceae*, *Rubiaceae* and *Moraceae*. Infection intensity on the infected plants ranged between intense infection (17 plants), medium infection (26 plants) and weak infection (3 plants). Conidia was found on one of the leaf surfaces or both, on the stems, buds, flowers and fruits of the infected plants. Cleistothecia were found on 15 plants mainly on the upper side and on the stems and flowers. Conidia and conidiophores appeared under a light microscope as hyaline and conidia shapes varied between cylindrical, oval, barrel-shaped and sharply pointed. Their dimensions ranged between 22.5 x 10.7 micron for *Erysiphe graminis*, and 57.3 x 13.5 micron for *E. cichoracearum*. Conidiophores varied in length between 52 and 135.6 microns. Cleistothecia were of the closed type, either oval or spherical, with an average diameter of 68.5 micron for *E. cichoracearum* and 209.2 micron for *Phyllactinia*. 21 plants were found infected for the first time in Iraq and recorded as new hosts for powdery mildew; 12 plants of which belonged to the family Asteraceae and 3 plants to the family Ammiaceae. *Sphaerotheca cephalarii* was recorded on the *Cephalaria syriaca* and *Phyllactinia* sp. on the *Althaea rosea* for the first time in Iraq.

F 25

ISOLATION AND IDENTIFICATION OF LIPASE PRODUCING FUNGI ASSOCIATED WITH SESAME SEEDS. Faten N.M. Al-Refai, College of Sciences University of Mosul, Mousel, Iraq, Email: fatennm04@yahoo.com

This study was conducted to identify sesame seed-borne fungi which produce the enzyme lipase. Forty different isolates were collected from different regions of Iraq (Baghdad, Slah Al Dan, Babylon, Taamim, Al-Anbar and Ninevah). The incidence of *Rhizopus stolonifer* and *Aspergillus niger* was found to be 22 and 20%, respectively from Ninavh seed, and 14 % of *Alternaria sesami* from Al-Anbar seed. A qualitative test was conducted to check the potential of these isolates to produce lipase in solid cultures and to identify the most efficient fungus in producing the enzyme. It was found that all isolates produced lipase except *Rhizoctonia solani* and *Fusarium* sp. isolated from Baghdad and Babylon, respectively.

F 26

ROOT ROT DISEASE OF *CHLOROPHYTUM COMOSUM* AND ITS CHEMICAL CONTROL. K. H. Taha, N. A. Kassim and O. Al-Atrakchi, College of Agriculture and Forestry, Mosul University, Iraq, Email: adeemramadan@yahoo.com

A study to control a root rot disease of *Chlorophytum comosum* grown in different shade houses and green houses in Ninevath governorate, Iraq, was conducted. *Fusarium solani* (Mart.) sacc. and *Rhizoctonia solani* Kuhen were found to be the causal organisms. From natural and artificial infection, it was found that the variety *Chlorophytum comosum Phylangim* was more susceptible than *Chlorophytum comosum varigatum* while the *Chlorophytum comosum varigatum* was resistant to root rot. The fungicides Homa, Benomyl and Vitavax- theram were effective when used to control the disease and inhibited considerably fungal growth in solid media.

F 27

MOLECULAR CHARACTERIZATION OF EUROPEAN AND EGYPTIAN ISOLATES OF *SCLEROTIUM CEPIVORUM*, THE CAUSAL ORGANISM OF ONION WHITE ROT. Nashwa Sallam, M.H.A. Hassan and A.A. Abd Elrazik, Department of Plant Pathology, Faculty of Agriculture, Assiut University, Assiut, 71256, Egypt, Email: mhasan@aun.edu.eg, amnsallam@yahoo.com

The tested European and Egyptian isolates of *S. cepivorum* were able to infect Giza 6 onion cultivar causing white rot disease with different degrees of disease severity (ranging from severe to weak). Pattern of esterase isozymes produced by the tested isolates of the pathogen using electrophoresis showed two main bands which were different in density. Such differences in bands density were present in every run and therefore appear to be indicators for differences among the tested isolates. Analysis of the protein pattern of the tested isolates of the pathogen by using electrophoresis indicated that the tested isolates had major proteins of a molecular weight at 52, 36, 23 and 16 kDa. Variation between isolates was detected by the presence of low molecular weight bands. Isolates No. 1, 4, 5, 7, 8, 9, 10 and 13 had a band at 17 kDa, whereas isolates No. 2, 3, 6, 11, 12, 14, and 15 had a band at 20 kDa. Using RAPD analysis to evaluate the genetic diversity of the tested isolates indicated that the tested field population of the pathogen was

genetically heterogeneous but shared a number of common band with molecular weights ranging from 650 to 2500 bp. Based on the DNA banding pattern the tested isolates can be assigned to seven genetically different groups. All tested isolates produced a band at 2500 bp except isolate No. 7.

F 28

SURVERY OF WILD AND CROP HOST PLANTS OF *ERYSIPHE* SP. (ASCOMYCETES: ERYSIPTACEAE) IN SOME REGIONS OF SYRIAN COAST. Gaidaa Hasan Youns¹, N. Ali¹ and M. Ahmed², Department of Botany, Faculty of Science, Tishreen University, Lattakia, Syria, Email: aimana@scs-net.org

Powdery mildews (Erysiphaceae) is an important group of fungi, which infect many wild species (weed and trees) and field crops (vegetables, fruit trees and ornamentals). Field and laboratory studies on isolates collected from the coastal during the period 2000-2002 showed wide distribution of wild and crop plants infected with *Erysiphe*, and the following 18 species were recorded: *E. aquilegiae*, *E. artemisiae*, *E. betea*, *E. biocellata*, *E. buhrii*, *E. cichoracearum*, *E. convolvuli*, *E. cruciferaru*, *E. depressa*, *E. galeopsidis*, *E. galii*, *E. heraclei*, *E. knautiae*, *E. orontii*, *E. pisi*, *E. polygoni*, *E. punica* and *E. sordida*. These species were found to infect 107 plant species, belonging to 20 families. Thirty six plant species were found carrying the conidial and cleistothecial stages, whereas 68 species were carrying the conidial stage only. Fourteen species of powdery mildews were found in both conidial and cleistothecial stages on their host plants, whereas 4 species were found in conidial stage only. Some species were found on large number of plant species; *E. cichoracearum* was recorded on 36 plant species, *E. pisi* on 16 plant species, and *E. cruciferarum* on 14 plant species, whereas few species were found only on one host plant such as *E. galii* on *Galium aparine* L. and *E. punica* on *Punica granatum* L.

F 29

THE EFFECT OF SOIL TEXTURE ON ROOT AND STEM ROT OF PEPPER, TOMATO, AND POTATO CAUSED BY *PHYTOPHTHORA* SPP. Abdelhadi Guechi¹ and Messaouda Benabdelkader². (1) Laboratory of Microbiology and Phytopathology, Faculty of Science, Ferhat Abbas University, Setif 9000, Algeria; (2) Department of Ecology, Science Faculty, Jijel University, Algeria, Email: yamina_messaouda@yahoo.fr

The root and stem rot is a widely spread disease in Algeria, on Solanaceae plants (sweet pepper, tomato and potato). The disease can be found either in greenhouses or in fields. It is caused by *Phytophthora* spp. (*P. capsici*, *P. infestans*). Spores germination occurs at the plant's collar, in the presence of high humidity and moderate temperature. Disease symptom can be observed clearly after 48h to 72h after infection. It has been shown that the soil texture has an effect on the rate of infection. No infection was observed in all plants of tested species in sandy soil. Whereas, they ranged from 50 to 80% in loamy clay soil, and between 20 and 30% in equilibrium texture (mixture soil). There is a significant differences between the means infections of all plants for each soil, they were 0% in sandy soil, 66.66% in loamy clay soil, and 23.33% in balanced soil.

F 30

GENETIC ANALYSIS OF PARTIAL RESISTANCE TO PHOMA COLLAR AND ROOT NECROSIS IN SUNFLOWER (*HELIANTHUS ANNUUS* L.). Taissir Abou Al-Fadil, Seifollah Poormohammad Kiani, Gregory Dechamp-Guillaume, Laurent Gentzittel and Ahmad Sarrafi, Laboratoire de Biotechnologie et Amélioration des Plantes (BAP), INP-ENSAT, 18 chemin de Borde Rouge, BP 32607, 31326 Castanet, France, Email: taissir@ensat.fr

The aim of present research was to study the genetic control of partial resistance of sunflower to *Phoma macdonaldii* collar and root isolates, and to identify genomic regions involved in partial resistance. The experiment was conducted using F9 recombinant inbred lines (RILs) and their two parental lines. The RILs population was developed through single-seed descent (SSD) from a cross between 'PAC2' and 'RHA266'. Parents showed contrasting response in their partial resistance to *Phoma macdonaldii* isolates on the basis of preliminary studies. Several QTLs with moderate effects were identified for each Phoma collar and root necrosis isolates. Co-locations of QTLs were observed being due to involvement of the same genomic regions in partial resistance to different collar and root isolates. Several QTLs were also detected to

be specific for a given collar or root necrosis isolate, which could be of interest for marker-assisted selection for resistance to a given isolate as well as for selecting favorable alleles controlling resistance to different isolates.

F 31

ENHANCEMENT OF *ALTERNARIA SOLANI* ISOLATES FOR SPORULATION ON CULTURE MEDIA AND EVALUATION OF THEIR PATHOGENICITY. Salam A. Al-Amery¹, M.M. Jarjees² and K.S. Juer². (1) State Board for Agricultural Research, Ministry of Agriculture, Iraq, Email: salam_bbs@yahoo.com; (2) College of Agriculture, University of Baghdad, Abu-Gharib, Baghdad, Iraq.

Early blight of tomato has been considered as one of the most important diseases in many regions of the world in greenhouses and high rainfall areas. The disease affects leaves, petioles, branches and fruits causing rotting. The causal organism of the disease does not produce conidia on culture media under laboratory conditions or may need specific requirements to produce them. This study was carried out to isolate the causal fungus and confirm its identity. Many attempts were made to enhance the sporulation of the fungus on culture media. The fungus colonies grown on CzpeX dox agar were exposed to different temperature and light regimes. Results will be compared with traditional methods.

F 32

ISOLATION AND IDENTIFICATION OF SOME FUNGI ASSOCIATED WITH CERTAIN CUCURBIT SEEDS IN SULAIMANIYAH GOVERNORATE AND GERMIAN REGION (IRAQ), AND THE EFFECT OF THEIR CULTURE FILTRATES ON GERMINATION RATE. Jalal H.S. Ismaeil Boskani, College of Agriculture, Sulaimaniyah University, Sulaimaniyah, Iraq, Email: jalal_boskani@yahoo.com

A number of fungal species were isolated from cucurbit seeds of local cultivars of squash (*Cucurbita pepo* L.), muskmelon (*Cucumis melo* L.), cucumber (*Cucumis sativus* L.) and watermelon (*Citrullus lunatus* (Thumb) Mansf) collected from Sulaimaniyah governorate and Germian region. (Iraq) The isolated fungal species from Sulaimaniyah were identified as: *Alternaria alternata*, *Aspergillus nidulans*, *A. niger*, *Fusarium oxysporum*, *Monilia* sp., *Penicillium digitatum*, *Phytophthora* sp., *Rhizoctonia* sp., *Rhizopus stolonifer* and *Streptomyces* sp. The frequency of isolated fungi from squash, muskmelon and cucumber seeds was 0.28, 0.149 and 0.36%, respectively. The isolated fungi from Germian region were: *Alternaria alternata*, *Aspergillus nidulans*, *Monilia* sp., *Penicillium digitatum*, *Rhizoctonia* sp. and *Ulocladium* sp., and their frequency was 0.203, 0.35 and 0.9% in muskmelon, squash and watermelon seeds, respectively. The results of this study revealed significant differences in the occurrence of fungi associated with seeds of various species collected from different regions. Culture filtrates of certain fungi reduced seed germination rate of some cultivars.

F 33

NUMERICAL TAXONOMY OF SPECIES OF PATHOGENIC FUNGI RELATED TO THE *ALTERNARIA* GENUS ISOLATED FROM DIFFERENT CROP PLANTS AT NINEYEH, IRAQ. W.S.Kassim and R.K. Albarhawi, Department of Biology, Collage of Science, University of Mosul, Iraq, Email: riyadh.albarhawi@yahoo.com

Fungi related to the genus *Alternaria* were isolated from infected leaves of winter and summer crops (163 isolates) from Nineyeh's governorate, Iraq, and they were diagnosed to belong to 11 species. Seventy isolates were selected for numerical taxonomy where morphological, physical characters of the colonies in addition to the microscopical characteristics of the isolates were studied. Numerical taxonomy through cluster analysis and weighed average was used. Percent of similarity between isolates was assessed by using simple matching coefficient. The isolates were divided into 3 main and 28 subsidiary clusters. The first main cluster included the following species: *A. longipes*, *A. alternata*, *A. danthi*, *A. stat of pleopolar*, *A. tenssinma* and *A. tenies*. The second main cluster included: *A. brassicaer*, *A. brassicola*, *A. danthicola* and *A. cherinthe*. The third main cluster included *A. rancidi* only.

F 34

THE ABILITY OF SOME FUNGI ISOLATED FROM *SILYBUM MARIANUM* L. GAERTH TO PRODUCE CELLULASE. W.S. Kassim and R.K. Albarhawi, Department of Biology, Collage of Science, University of Mosul, Iraq, Email: riyadh.albarhawi@yahoo.com

An investigation has been carried out to isolate and diagnose of some fungi associated with the bleaching symptoms on leaves and stems of *Silybum marianum* L. Gaerth and their ability to produce cellulose. Twelve fungal isolates belonging to three genera and seven species were isolated are as follows: *Alternaria alternate* (one isolate), *Aspergillus flavus* (4 isolates), *Aspergillus fumigatus*, *A. parasiticus*, *A. niger* and *Fusarium oxysporum* (one isolate foe each), and *Fusarium solani* (3 isolates). A qualitative and quantitative test was carried out to explore the efficiency of these isolates to produce cellulose in solid and liquid cultures.

F 35

INTERACTION OF *MEDICAGO TRUNCATULA* WITH SOIL-BORNE PATHOGENIC MICROBES AND THE ROLE OF SALICYLIC ACID IN REGULATION OF DEFENCE RESPONSES. Anas Khanshour, Montserrat Ramirez-Suero and Martina Rickauer, Ecole Nationale Supérieure d'Agronomie de Toulouse, Pôle de Biotechnologie Végétale 18 chemin de Borderouge, BP 32607 Auzeville, 31326 Castanet-Tolosan, France, Email: anaskhanshour@yahoo.com

Medicago truncatula has been established recently as a model for the study of legume plants, it is a host to several pathogenic microbes and is also able to live in symbiosis with bacteria (nitrogen-fixing nodules) and fungi (mycorrhiza). In order to compare the regulation of defense responses in symbiotic and pathogenic interactions, a pathosystem involving *Fusarium oxysporum* f.sp. *medicaginis* was currently characterised. *Fusarium oxysporum* is a soil-living fungus causing vascular wilt in a large array of cultivated plants. Various lines of *M. truncatula* (including local population from Syria) were inoculated with isolates obtained from various legume plants in order to search for incompatible interactions where the plant resists the pathogen. A pathogenic isolate of the fungus has been transformed recently with a constitutive reporter gene encoding the jellyfish Green Fluorescent Protein (GFP). This strain was used to study the root colonization process by fluorescence UV and CONFOCAL microscopy in susceptible and partially resistant plants. In order to study the regulation of defense responses by the signaling pathway involving salicylic acid (SA), *M. truncatula* was transformed with the bacterial *NahG* gene coding for salicylate hydroxylase. Transgenic plants producing this enzyme will not be able to accumulate SA. A protocol for stable transformation of *M. truncatula* line A17, which is a genotype difficult to transform is about to be established. Transgenic plants will be characterized in the future for susceptibility/resistance towards *Fusarium* and other pathogens and for accumulation of SA after elicitation or inoculation. Such transgenic plants will be an important novel tool to study defenses and resistance in legume-microbe interactions.

F 36

SOIL SOLARIZATION: AN EFFECTIVE METHOD TO CONTROL CORKY ROOT ROT IN TOMATO GROWN IN PLASTIC HOUSES ALONG THE SYRIAN COAST. Qusay Al-Rhayeh¹, Samir Koudsieh², Mohamad Abou-Shaar² and Watfa Al-Ibrahim¹. (1) General Commission of Scientific Agricultural Research (GCSAR), Lattakia, Syria, Email: qusay73@scs-net.org; (2) Department of Plant Protection, Faculty of Agriculture, University of Aleppo, Aleppo, Syria.

Research was carried out on tomato corky root rot caused by *Pyrenochaeta lycopersici*, and its control in plastic houses under the conditions of Syrian coast, using environment-friendly methods (soil solarization, cabbage residues, poultry manure, *Trichoderma harzianum* and *Bacillus subtilis*), during the planting seasons 2001/2002 and 2002/2003. The results showed high effectiveness of soil solarization in reducing infection of the pathogenic fungus and number of its live microsclerotia isolated from the soil, which caused significant increase in growth and plant yield by 78.16 and 61.30%, respectively. Cabbage residues and poultry manure have had an effective role in supporting soil solarization and increasing the plant growth to 88.87 and 86.08% respectively, and plant yield to 65.74 and 69.05%, respectively. Whereas, poultry manure and biocontrol agents had no significant effect in reducing the infection or improving plant growth and production.

F 37

SPREAD OF DOWNY MILDEW DISEASE ON SQUASH IN EGYPT AND ITS CONTROL. S.M. El-Desouky, Plant Pathology, Research Institute, ARC, 9 Gamaa Street, Giza, Egypt, Email: shawkidesouki@yahoo.com

Downy mildew of squash is a widespread disease in Egypt. During the autumn season of 2001 typical symptoms of downy mildew were observed on squash plants (*Cucurbita pepo* L.) grown in some fields at Minufiya and Qalubiya governorates. The disease spread rapidly causing a severe epidemic. Disease occurrence was studied in Minufiya and Qalubiya governorates. Disease development on infected plants was described and recorded during 2002 and 2003. Pathogenicity test using different isolates of *Pseudoperonospora cubensis* in humid chambers in a greenhouse revealed that all isolates tested exhibited identical pathogenicity. Based on standard infection types, different squash genotypes were tested and evaluated. Disease severity, area under the disease progress curve (AUDPC) and rate of disease increase (r-value) were recorded on the different genotypes under field conditions. The different genotypes showed different levels of disease incidence. All tested fungicides reduced the disease incidence at all dates of application. Systemic fungicides were more effective than of contact fungicides.

F 38

PATHOGENICITY, TOXICITY, AND GIBBERELIC ACID CONTENT OF *FUSARIUM MONILIFORME* CAUSING ROOT ROT AND DAMPING OFF OF PEPPER. Heidi I.G. Abo-Elnaga¹ and Naglaa G. Ahmed². (1) Department of Plant Pathology, Faculty of Agriculture, Assiut University, Assiut, Egypt; (2) Plant Pathology Agricultural Research Center, Giza, Egypt.

Fusarium moniliforme (sheldom) was isolated from naturally infected roots of different pepper plants. Pathogenicity tests indicated that *Fusarium moniliforme* was more pathogenic to Lang Red and Cagenne (hot pepper) than to the Local sweet pepper "California Wonder" and "California" sweet pepper under greenhouse conditions. The two isolates differed in their capability of inducing the infection. Different quantities of each of fumonisin, zearelonen and gibberellic acid were produced by the tested isolates of *Fusarium moniliforme in vitro*. The infected pepper plants were evaluated for resistance to *Fusarium moniliforme* and fumonisin and zearelonen concentrations.

F 39

HISTOPATHOLOGICAL STUDY ON THE EFFECT OF CROPS AND FEED CONTAMINATED WITH OCHRATOXINS. K. Al-Saamurai¹, K.S. Al-Kaise² and E.H. Al-Nuaemy³. (1) Biotechnology Research Center, Al-Nahrain University; (2) Medical Faculty, Al-Nahrain University. (3) Al-Nahrain University, Iraq, Email: Khulood-whayeb@yahoo.com Names and address

Ochratoxins are secondary metabolites produced by some fungal species from the genera *Aspergillus* and *Penicillium* in different agricultural commodities, such as maize, causing great economic losses and health hazards. Pathological study due to ochratoxicosis revealed the appearance of pathological changes in liver including degenerative changes in hepatic architecture, presence of vacuoles in the cytoplasm and haemorrhage. Ultrastructural study indicated degeneration in the nuclei, cytoplasm, mitochondria and endoplasmic reticulum.

F 40

IDENTIFICATION OF GENETIC DIVERSITY AMONG DIFFERENT ISOLATES OF *BOTRYTIS CINEREA* IN TUNISIA. Dorsaf Ben Ahmed and Walid Hamada, INAT 43, Av Charles Nicolle, Institut National Agronomique de Tunis, 1082 Tunis, Tunisia, Email: hamada.walid@iresa.agrinet.tn

Botrytis cinerea is a plant pathogenic fungus that causes grey mould on a wide range of plants. This work aimed to evaluate the genetic diversity of *B. cinerea* in Tunisia using molecular markers and the level of resistance to fungicides. Isolates collected from different plants (grapes, tomato, strawberry...) and different localities were analyzed to determine whether the two groups *transposa* (78%) and *vacuma* (4%), described in French vineyards, are present in Tunisia. A combined PCR and Dot Blot method was developed to identify the presence of transposable elements *Boty* and *Flipper*, which distinguish between the two groups. As described in France, both *transposa* and *vacuma* were found in Tunisia. Furthermore, isolates containing the transposable element *Boty* alone were also detected. The digestion of the *Bc-hch* PCR product

with *HhaI* enzyme identified the presence of the only group of *Botrytis cinerea* corresponding to one allelic type. Moreover, all the strains tested for their resistance to the novel fungicide Fenhexamid exhibited a sensitive phenotype confirming the presence of this only group of *B. cinerea* in the Tunisian population.

F 41

PREPARATION AND ROLE OF BIO-PHOS IN THE NUTRITION AND RESISTANCE OF *CITRULLUS VULGARIS* L. TO INFECTION WITH *FUSARIUM WILT*. Adham Ali Assaffii, Agriculture College, Anbar University, Iraq, Email: assaffii2004@yahoo.com.

Laboratory Experiment to prepare Bio-phos has been carried out. The experiment was based on a field observation for three seasons at Al-Dawer, 25 km west Ramadi city of Anbar governorate, Iraq. A clay soil and plants powder (*Cyperus rotundus* Linn., *Phragmites australis*, *Eucalyptus microtheca*) were used at 20, 10, 40 and 30%, respectively. The contents were mixed with rock phosphate-appetite at a ratio 1:1. The mixture was moistened with sterilized whey and then was inoculated with *Streptomyces* sp., *Pseudomonas fluorescence* that has been isolated from the observed area (because of high total density of microbes on the roots of unaffected plants). The treatments were incubated at 28±2 C° for 10, 20 and 30 days. The results indicated that the Bio-phos - *Streptomyces* sp. preparation incubated for 30 days produced the highest content of phosphorus, nitrogen, calcium, magnesium, two acids (humic, fulvic), in addition to biomass and siderophores compounds, followed by the material inoculated *P. fluorescence* and incubated for 20 days. The ability of the prepared material and its water extract (5:1) in the inhibition of the *Fusarium* sp. was evaluated. The result indicated the activity of the extract from Bio-phos-ps. incubated for 20 days was the highest, and led to complete inhibition of *Fusarium* sp. The Bio-phos-st. effect increased with the increase in the incubation period. Both characterized material were used to prepare three treatments; Bio-phos-st, Bio-phos-ps, and a mixture of both at a ratio of 1:1. All treatments were added at the rate of 5 g/plant, and by using three different methods; the first with seeds, the second in two doses, one with seeds, and the other a month later, and the third was added one month after planting. The experiment was carried out in the same field area planted with watermelon (Charleston Negara *Citrullus vulgaris* L.). The rate of infection and average production were recorded. The result revealed the superiority of the mixture given in two doses (second treatment) which gave low infection rate of 8.5% and highest productivity of 40 ton/ha.

F 42

MOLECULAR DIVERSITY OF *NEOTYPHODIUM* ENDOPHYTES IN FESCUES USING PCR-RFLP PATTERNS OF RDNA-ITS REGIONS. B. Sharifnabi and A.F. Mirlohi, College of Agriculture, Isfahan University of Technology, Isfahan, Iran, Email: sharifna@cc.iut.ac.ir

Fescues (*Festuca* spp.) are important pasture and turf grass, found to be infected with endophytic fungi of *Neotyphodium* in Iran. *Neotyphodium* endophytic fungi grow asymptotically within the grass foliage. These fungi can be detected in plants using histochemical, immunological, tissue culture and molecular techniques. Seven isolates of *Neotyphodium* were obtained from leaf sheaths of *F. arundinacea* and *F. ovina*. Genomic DNA was isolated from fungal mycelium using CTAB method. Primers 11I and 11II were used to identify *N. coenophialum*, which produced a 1000 bp band. All isolates were proven to be *N. coenophialum* using specific primers and morphological characters. ITS regions of rDNA were amplified using ITS1 and ITS4 primers. These regions have often proven useful to reconstruct phylogenetic relationships at species taxonomic levels. The amplicons used for RFLP analysis with *Cfo* I and *Taq* I restriction enzymes. The presence or absence of bands was coded in binary form (0/1) and the matrix was used in cluster analysis using UPGMA method using NTSYS ver.2.2 software. According to dendrogram obtained by restriction map, five isolates from *F. arundinaceae* which were morphologically identical were clustered in a single group. Isolate Fakh, which was also morphologically similar to the other five isolates, clustered in a separate group and isolate Fogh which was morphologically completely different from others was clustered in third group and was morphologically identical to *N. festuca*. Thus, it is necessary to sequence this pattern which also produced a 1000 bp band of *N. coenophialum* and has morphologically different characters. The preliminary comparisons indicated that morphological differences in *Neotyphodium* species coincide with differences in RFLP patterns of ITS region of ribosomal genes, but more specimens and restriction enzymes are needed to verify the discriminatory value of this finding.

F 43

INVESTIGATION ON RACES AND GENETIC DIVERSITY IN POPULATION OF *FUSARIUM OXYSPORUM* F. SP. *LYCOPERSICI* IN NORTHERN AND RAZAVI KHORASAN PROVINCES IN IRAN USING RAPD MOLECULAR MARKERS. N. Heidarzadeh, M. Falahati Rastegar and B. Jafarpour, Department of Plant Pathology, Faculty of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163, Iran, Email: nahidheidarzadeh@yahoo.com

This study was carried out to identify the physiological races and genetic diversity of *Fusarium oxysporum* f.sp. *lycopersici*, the casual agent of tomato wilt. Thirty five isolates of *Fusarium oxysporum* were recovered from infected roots, crown and stems of tomato plants collected from fields in major tomato producing areas in Northern and Razavi Khorasan provinces during 2004-2005. Pathogenicity test done on cultivar Bonny Best indicated that 25 isolates were pathogenic on tomato and 10 isolates were non-pathogenic. The forma specialis test was carried out on tomato "Bonny Best", Datura, Cicer, melon and nightshade. All 25 isolates were pathogenic on tomato and non-pathogenic on the other plants tested. Races identification was performed on differential hosts: VFN-8 (resistant to race 1), Walter (resistant to race 1 and 2) and Bonny Best (susceptible). All isolates were pathogenic on Bonny Best and non-pathogenic on the other plants. The results confirmed the existence of race 1 in this area. 25 pathogenic isolates were selected for RAPD reaction. Ten primers were used in this study. Cluster analysis revealed 12 genetically distinct clusters. The results of cluster analysis did not confirm any passive correlation between genetic diversity and geographic origins of these isolates.

F 44

PATHOGENIC AND GENETIC CHARACTERIZATION OF ISOLATES OF *FUSARIUM SOLANI* F. SP. *PHASEOLI* BY AFLP ANALYSIS. S. Zarezadeh, M. Falahati Rastegar, B. Jafarpour and E. Mehdikhani Moghadam, Department of Plant Pathology, Faculty of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163, Iran, Email: sa_zal770@yahoo.com

Root rot disease of bean which is expressed as yellowing or wilting of plants is an important disease associated with this crop which causes severe damage and loss annually. During 2004-2005, a survey for this disease was conducted in the major bean growing areas in Razavi and Northern Khorasan and Tehran provinces of Iran. Forty isolates of *Fusarium solani* were obtained. Isolates were kept in SNA and makarti glasses containing sterile sand for short and long periods, respectively. Pathogenicity test was conducted with bean seedlings using root dip method and infected sorghum seeds were placed around taproots. Host range study of *F. solani* showed that the pathogenic isolates caused root rot only in bean. Based on pathogenicity test, host specificity and morphological characteristics, the fungus was identified as *Fusarium solani* f. sp. *phaseoli*. The high resolution genotyping method of amplified fragment length polymorphism (AFLP) analysis was used to study the genetic relationship within natural populations of *Fusarium solani*. AFLP templates were prepared by the digestion of *Fusarium* DNA with EcoRI and Tru9I restriction endonucleases and subsequent ligation of corresponding site specific adapters. The amount of genetic variation was evaluated by polymerase chain reaction (PCR) amplification with 3 AFLP selective nucleotide primer pairs. Results obtained indicated that no clear trend was detected between clustering in the AFLP dendrogram and geographic origin or host genotype of the tested isolates, with few exceptions.

F 45

EFFECT OF EXPOSURE OF THE FUNGUS *ALTERNARIA ALTERNATA* TO UV IRRADIATION ON POLYSACCHARIDE AND TOXIN PRODUCTION. Mohammed B. I. Qasim and Esam D. Sulaiman, Department of Biology, College of Education, University of Mosul, Iraq, Email: esamdawood@yahoo.com

Conidial spores of the fungus *Alternaria alternata* isolated from winter tomato fruits in Iraq were exposed to different periods of Ultra Violet light irradiation in order to evaluate its effect on polysaccharide and toxin production by the fungus. Production of polysaccharides was enhanced on the selective medium when exposed to 120 minutes of UV light and reached to 3.78 g/l in shaken cultures, whereas, there was no toxin secretion by all mutated isolates.

F 46

A STUDY ON INOCULATION AND PENETRATION OF *ALTERNARIA ALTERNATA*, CAUSAL AGENT OF TANGERINE BROWN SPOT AND NAVEL ORANGE BLACK ROT DISEASES IN NORTH OF IRAN. A.A. Dehpour¹, S.V. Alavi² and A. Majd³. (1) Biology Department, Ghaemshahr Islamic Azad University, Email: adehpour@yahoo.com; (2) Plant pests and Diseases, Mazandaran Agricultural Research Center; (3) Biological Department, Tehran-Shomal Islamic Azad University, Iran.

Alternaria species cause two different diseases on citrus in north of IRAN: *Alternaria* brown spot of tangerines and *Alternaria* black rot of Navel oranges. In this study, infected tissue from leaves, fruits and young stems of the plants was collected, and cut to 2×2 mm pieces and then fixed over night at 5 C in 0.2 M phosphate buffer including 2% gluteraldehyde. Post fixation was in 1M osmium tetroxide for 5 hours. Specimens were then rinsed and taken through a series of alcohols of increasing concentration and finally lyophilized for 5 h. The specimens were then coated with gold and studied using a LEO 435 scanning electronmicroscope. For transmission electronmicroscopy, specimens after being fixed in gluteraldehyde and osmium tetroxide, were embedded in spurr's medium. Thin 200-500 nm and ultra thin (70-120 nm) sections were stained and viewed under Zeiss transmission electron microscope. The present study showed that the court of infection is direct through stomata. Penetration of conidia without appresoria formation occurred through stomata. Hypha penetrated through the sub stomatal cavity. Some of hyphal branches grew in the intercellular space of the mesophyll and surrounding paranchyme tissue. The Hyphal product, especially toxins (HST and NHST) caused damage to the cells and cell wall. The study showed that the hypha did not penetrate the xylem tissue.

F 47

ISOLATION AND IDENTIFICATION OF SUGAR BEET (*BETA VULGARIS* L.) SEED-BORNE FUNGI AND MEANS OF C, HEMICAL AND BIOLOGICAL CONTROL. Nadeem A. Ramadan and Noor A. Alubeidi, Biology Department, Collage of Science, Mosul University, Iraq, Email: nadeemramadanm@yahoo.com

Seed health testing showed the presence of fungal species which belong to seven genera: *Amorphotheca*, *Aspergillus*, *Chaetomium*, *Fusarium*, *Phoma* and *Pythium*, isolated from sugar beet seeds obtained from Mosul, Iraq. Fungal species of the general *Aspergillus*, *Chaetomium*, *Macrophomina*, *Mucor* and *Rhizoctonia* were identified from seeds obtained from Alexandria, Egypt. Identification revealed the presence of two species of *Aspergillus* (*A. fumigatus* and *A. niger*). *Amorphotheca resiniae*, *F. solani*, *Ph. betae* and *P. ultimum* associated with seeds from Iraq and *A. fumigatus*, *M. phaseolina* and *Mucor* spp. in seeds from Egypt. *Amorphotheca resiniae* and *Mucor* spp. are reported for the first time on the sugar beet seeds. During testing, sugar beet sensitivity for fungi isolated from seeds obtained from Iraq and Egypt showed that *P. ultimum* had the highest pathogenic effect causing heavy mortalities in different sugar beet cultivars with a percentage of surviving plants of 1.66%, whereas *M. phaseolina* was weakly pathogenic (60.66%). The bacteria *Bacillus cereus* was used in this study to inhibit the fungi isolated from sugar beet seeds, where inhibition rate to *R. solani* and *F. solani* all the percentage reached 91.4% and 84.4%, respectively. *B. subtilis* equally inhibited all the fungi tested. *Pseud. flourcense* completely inhibited *P. ultimum* and there was no significant difference with *A. resiniae* and *Ph. betae*, whereas the remaining fungi were less inhibited by the bacteria. The best fungicide used for control was benomyl (100% inhibition) except for *M. phaseolina* and *P. ultimum*, if gave 94.4% and 78% inhibition, respectively, whereas Rovral inhibited all the fungi tested except *A. resiniae* and *C. globosum*.

F 48

ROLE OF CALCIUM LEVELS IN SUGAR BEET RESISTANCE TO ROOT ROT DISEASE. M.M.A. El-kholi¹, A.Z. Aly² and A.M.H. Esh¹ (1) Sugar Crop Diseases Department, Sugar Crops Research Institute, ARC, Orman 12619, Giza, Egypt, Email: el_kholi@yahoo.com; (2) Plant Pathology, Agriculture Collage, Zagzic University, Egypt, Email: el_kholi@yahoo.com

The present study was conducted to investigate the role of calcium on sugar beet resistance to sugar beet root rot disease caused by the fungus *Rhizoctonia solani* under greenhouse conditions. Highly significant differences occurred between the different calcium concentrations used and the rate of infection

and severity of *R solani* root rot obtained. The highest rate of infection as well as severity was obtained the seedling nutrition depended on Hogland's solution contained 0.0 Mm and 1.0 mM of calcium (76 %, 80% and 4.52, 4.08 degree of root rot severity, respectively). The calcium concentration 2.0 mM in the nutrition solution significantly decreased the disease rate and severity to 68% and 3.38 respectively. The highest reduction of disease rate e and severity was obtained when the level of calcium concentration in nutrition was 4.0 mM (60% and 2.08 respectively). The histopathological studies showed that the invader mycelium of *E. solani* was restricted in the epidermis tissue, when high level of calcium was used. On the contrary, when a low concentration of calcium was used, the fungus easily colonized the root tissue.

F 49

SLOW MILDEWING IN SUGAR BEET POWDERY MILDEW. M. Sheikholeslami¹, H. Younesi¹ and J. Basati². (1) Department of Plant Protection; (2) Department of Sugar Beet Seed Breeding, Agricultural Research Center of Kermanshah, Iran, Email: mlsheikh@yahoo.com

Sugar beet powdery mildew is one of the most important diseases of this crop all over the world. Due to the disease preference of dry climate, the damage is much higher in arid regions including Iran. In our *In Situ* studies we concluded that although the onset of the disease on resistant and susceptible genotypes was the same but the rate of disease development on resistant genotypes was much lower in comparison with susceptible ones. Disease development under *In Vivo* conditions indicated that the proportion of the conidia which produced elongated secondary hyphae (ESH) to the whole number of germinated conidia, the number of conidiophores and the number of produced conidia on the leaves were comparatively lower in resistant genotypes. These results indicated that many minor factors can provide a desirable level of resistance to sugar beet powdery mildew which keeps the disease below threshold level and decrease the chances of the emergence of new pathotypes.

F 50

THE PRESENCE OF THE A2 MATING TYPE OF *PHYTOPHTHORA INFESTANS* IN TUNISIA. Wiem Jmour, Kalthoum Harbaoui and Walid Hamada, Laboratory of Genetics, National Agronomic Institute of Tunisia, 43 Av. Charles Nicolle, 1082 Tunis-Mahrajene, Tunisia, Email: hamada.walid@iresa.agrinet.tn

Phytophthora infestans, the causal agent of late blight, is considered in Tunisia as the major threat on potato since it is present almost all year around in the field (three cropping seasons). The first objective of our study was to identify the mating type of Tunisian isolates collected from potato fields since the presence of both types in the same area may generate new genotypes of the pathogen that could be more aggressive. For this, DNA of the oomycete was PCR amplified with specific primers linked to the mating type locus and subsequently digested. The patterns obtained revealed the presence of the A2 mating type for the first time in Tunisia representing about 12.5% of the population analyzed, but was detected only in the north east of the country. More investigations on the origin of the A2 mating type is needed. On another hand, since *P. infestans* can also infect tomato, the interaction with the two host plants is also studied to see whether any specialization is present in the pathogen. For this purpose, investigating genes from the pathogen involved in the interaction with the plants as the Extracellular Protease Inhibitors (EPI), is in progress.

F 51

MOLECULAR DETERMINATION OF *FUSARIUM SOLANI* ISOLATES IN POTATO PRODUCING AREAS IN IRAN. S. Baghaee Ravari¹, M. Falahati Rastegar¹, B. Jafarpour¹, F. Shokoohifar¹ and M. Eskandari². (1) Department of Plant Protection, Collage of Agriculture, University of Ferdowsi, Mashhad, Iran; (2) Diseases Research Department, Agricultural and Natural Research Center of Khorasan, Mashhad, P.O. Box 91775-1163, Iran, Email: sbaghaee81@yahoo.com

Fusarium solani is the causal agent of wilt and dry rot of potato that annually causes significant yield loss in potato producing areas in Iran. The objective of this study was isolation, recognition and detection of genetic variation of this pathogen in Iran. For this purpose, samples were collected from several parts of diseased potato plant: stem, crown, root and tuber. The pathogenicity tests including soil-infestation, root-dipping and tuber inoculation with spore suspension was performed on Agria variety for all isolates. The amount of genetic variation was evaluated by amplification of a part of the rDNA cluster with ITS4 and

ITS5 primers and also with a set of seven random primers on 28 pathogenic isolates from five provinces of Iran (Tehran, Hamadan, Ardabil, Razavi and Northern Korasan provinces). The amplification of rDNA-ITS divided all isolates in to ITS1 and ITS2 groups. Subjecting this region to digestion by *EcoRI* and *HaeIII* revealed that the second enzyme reveals more polymorphism in number and length of digested fragments than the first one. Only five primers showed polymorphism among isolates in RAPD. Genetic similarity between each of the isolates was calculated by using the Jaccard similarity coefficient, and cluster analysis was used to generate a dendrogram showing relationship between them. The genetic similarity of the isolates varied from 0.45 to 0.98. The least genetic similarity belonged to Tehran isolates and all the isolates grouped in to 16 genetic clusters at 75% similarity level. Results obtained indicated that cluster analysis revealed genetic diversity without any correlation to their geographical origin and pathogenicity. Further more, genetic variation among isolates of this pathogen was very high in RAPD. In comparison to PCR-ribotyping, RAPD analysis can be effectively employed as a reliable tool in genomic analysis of *Fusarium solani*.

F 52

STUDY OF POTATO DISEASES IN THE WESTERN REGION OF LIBYA. Fauzi A. Bisheya, M.M. Zantuti, M.M. Maauf, S.A. Sherlala and N.M. Maghrbi, Agricultural Research Center, Tripoli, Libya, Email bisheya@yahoo.com

Potato (*Solanum tuberosum*) is one of the important vegetable crops in Libya which is cultivated in both spring and autumn growing seasons. Potato crop is subjected to infection with many diseases especially fungal, bacterial and viral pathogens and nematodes. Field survey was conducted during spring and autumn growing's for three successive years 2003, 2004 and 2005, including 15 different regions (Ben-gasheer, Sukassabet, Marazeeg, BirTuta, BirTurky, Hamrunia, Wadi-Shargi, Tajoura, Garapoulli, Swani, Azzizia, Zahra, Maamoura, Gilada and Zawia). Results indicated that the infection level of tubers with soft rot, sixty days after planting was 11%, and early blight was 18% (spring 2003), while average infection rate of early blight 3% and late blight was 2.9% (spring 2004). Black scurf was 13.75%, common scab 9% and root-knot nematode was 3.2% (autumn 2005). Physiological disorders on potato tubers were detected such as tuber deformation, and cracking. Average of tuber surface area was 11.2 cm², number, length, and depth of cracks were 4.3 cm, 3.0 cm and 4.3 mm, respectively. Mean scab infection was 37%, and black scurf was 10.2% of examined samples. Eighteen potato cultivars were evaluated during spring and autumn growing seasons (2003-2004). Results showed that some variations in infection rate between 0.0-12.3% of black scurf, 0.0-2.7% soft rot and 5.0-42.3 common scab occurred.

F 53

PRELIMINARY STUDY OF MYCOBIOTA CONTAMINATING WHEAT GRAIN AFTER HARVEST AND DURING STORAGE. Omran Yousef¹, Haleem Yousef¹, Safea Al- Masri² and Adnan Nahlawe². (1) Al-Qamishli Agricultural Research Centre, General Commission for Scientific Agricultural Research, Al-Qamishli, Syria, Email: omran_y@hotmail.com; (2) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria.

During 2004 and 2005, 255 samples of Wheat grain were collected from different localities in Al Hasaka Governorate in two periods; immediately after harvest and three months after storage. 47 fungal species belonging to 11 genera were isolated and classified. Most of these species belong to *Penicillium*, *Aspergillus* and *Fusarium*, and to a less extent to *Alternaria*. In the first period, the common fungal species isolated from wheat grain belonged to *Alternaria*, *Cladosporium* and *Fusarium*, and to a less extent to *Helmentosporium*, *Aspergillus* and *Penicillium*. Whereas, *Aspergillus* and *Penicillium* spp. were dominant in the second period. The level of contamination of wheat grain by fungi ranged between 3×10^2 and 8.2×10^7 conidia/g of grain.

F 54

IMPORTANCE OF COMMON ROOT ROT ON WHEAT IN SYRIA. Mohammad El-Khalifeh¹, Ahmed El-Ahmed², Mwaffak Yabrak¹, Mohammad Azrak³ and Miloudi Nachit³. (1) General Commission for Scientific Agricultural Research (GCSAR), Aleppo Research Center, Aleppo, Syria, Email: m.khalifa@cgiar.org; (2) Plant Protection Department, Faculty of Agriculture, Aleppo University, Aleppo, Syria, Email: a.el-ahmed@cgiar.org; (3) International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: m.nachit@cgiar.org

Common root rot (CRR) on wheat is an important disease worldwide, including Syria. The disease can be a limiting factor to durum wheat production in the world. Appearance of dark brown spots on subcrown internode (SCI) is the primary indication of disease occurrence. Several species of fungi were found to be associated with infected plants particularly *Fusarium* spp. and *Helminthosporium sativum*. The objectives of this work were (1) to carry-out a survey on the occurrence of CRR disease in durum wheat fields in different Syrian governorates. (2) to study the effect of CRR on wheat yield and yield components under field conditions. Survey was conducted in 5 and 7 major durum growing governorates in Syria during the 2003 and 2004. The SCI of each sample was tested for infection, and severity of infection was determined using a 0-3 scale. The survey in the first season showed that Hassaka governorate had the highest rate of infection and severity of infection, whereas Aleppo and Idleb fields were the least affected. In the second season Hassaka fields showed similar results in terms of incidence and severity of infection, whereas Idleb was affected the least. To study the effect of CRR on wheat yield and yield components, two durum and two bread wheat genotypes which differ in susceptibility to CRR were grown in sick and in healthy plots. Grain yield, spikes number/plant and grain number/spike were significantly decreased in infected plants and negatively correlated with severity of infection. The 1000 kernel weight was not affected and poorly correlated with severity of infection. Yield loss varied in the different genotypes tested between 3.5 and 32.9%.

F 55

EFFECT OF THE POWERY MILDEW FUNGUS *ERYSIPHE GRAMINIS* ON SOME BIOCHEMICAL PARAMETERS OF BARLEY (*HORDEUM VULGARE*). Saliha Attab¹, Nora Alliou² and Louhichi Brinis¹. (1) Badji Mokhtar University, department of Biology, Annaba (23000) Algeria; (2) 8 may 1945 University, Science and engineer's faculty, Department of Biology, Guelma (24000) Algeria.

Powdery mildew caused by the fungus *Erysiphe graminis* is one of most common diseases on barley in Algeria. The crop yield is mainly correlated with the infection level of cultivars, it can be much reduced in susceptible cultivars. This study was conducted on five barley cultivars, and the possible effects generated by the fungus, were evaluated by quantifying two biochemical parameters: soluble sugar and free proline at different stages of disease development. The results showed that sugars and proline accumulation or their reduction varied from one cultivar to another, and based on the infection stage.

F 56

OCCURRENCE OF TAN SPOT ON WHEAT IN SYRIA. Shamsi Roula¹, Amor Yahyaoui², Ahmed El-Ahmed¹ and Miloudi Nachit². (1) Aleppo University, Aleppo, Syria; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: r.shamsi@hotmail.com

Pyrenophora tritici-repentis, the causal agent of tan spot on wheat, is a major leaf spot disease on wheat worldwide. The objectives of this study were: (1) to survey occurrence of tan spot and rate of infection in Syrian governments on durum wheat including: Homs, Hama (Al-Ghab), Aleppo, Idleb, Latakia, Tartous, Hasaka, Raqa, Daraa and Saueda, and (2) to determine suitable media for high rate of pathogen growth and optimal conditions that produce high rate of sporulation. Results indicated that the disease exists at Hasaka, Hama (Al-Ghab), Aleppo, Idleb, Latakia and Homs, where the rate of infection was 57.1%, 44.4%, 42.4%, 37.5%, 25% and 7.14%, respectively, but it was absent in Tartous, Daraa, Saueda and Raqa. The results also showed that the media prepared from local vegetables was the best for sporulation at 20°C, and continuous light, compared with other kinds of media.

F 57

IDENTIFICATION OF PHYSIOLOGICAL RACES OF *Puccinia triticina* ERIKS, WHEAT LEAF RUST IN NORTHERN SYRIA AND SOUTH TURKEY. Mohammad Kassem¹, Ahmed El-Ahmed¹, Mohammad Shafik Hakim² and Miloudi Nachit³. (1) Department of Plant Protection, Faculty of Agriculture, University of Aleppo, Syria, Email: agromohd@scs-net.org; (2) Department of Field Crops, Faculty of Agriculture, University of Aleppo, Syria; (3) ICARDA, P.O. Box 5466, Aleppo, Syria.

The wheat leaf rust caused by *Puccinia triticina* Eriks, occurs annually in most wheat growing areas worldwide. In the last few years, it became an important disease on wheat in Syria, due to increase in wheat irrigated area as well as the susceptibility of durum wheat to the disease, which gave more chance for disease spread, and the importance of this disease in Syria is increasing. Therefore, this work aims to determine the physiological races of *P. triticina* occurring in northern Syria and southern Turkey. A total of 26 physiologic races were identified during the 2003 and 2004 cropping seasons, using the North American System of Nomenclature for *P. triticina*, and placed into 14 groups. However, when the Unified System was used, there were only 9 races, whereas 15 races were identified when the International System was used.

F 58

SUREVEY OF FUSARIUM SPECIES ASSOCIATED WITH CROWN ROT OF WHEAT IN TUNISIA. Samia Gargouri, Noura Brahim and Mohamed R. Hajlaoui, Laboratoire de Protection des Végétaux, INRAT, rue Hédi Karray, 2049, Tunisia, Email: sgargouri@yahoo.com

Crown and foot rots caused by *Fusarium* species are among the most widespread soil and residue-borne diseases of wheat and barley in dry areas. To identify *Fusarium* species associated with crown and foot rot of wheat in Tunisia, samples were collected from 250 fields from 2000 to 2004. Disease symptoms were observed in almost all fields inspected. Five different *Fusarium* species were identified by morphology and dominant *Fusarium* species were further identified by using species-specific PCR assay. *F. culmorum* and *F. pseudograminearum* were the most frequent species. *F. culmorum* constituted 68% of all isolates and was recovered from all bioclimatic regions. *F. pseudograminearum* constituted 22% and showed limited distribution compared to *F. culmorum*. Indeed *F. pseudograminearum* constituted more than 50% of all isolates in the arid and inferior semi-arid regions, however its frequency decreased as we moved to the north and was totally absent in the humid region. The distribution of the two species is strongly correlated with climatic conditions. Ninety isolates of *F. culmorum* and *F. pseudograminearum* were tested for pathogenicity. All isolates tested caused severe symptoms of crown rot in plant infection assay with significant differences in aggressiveness.

F 59

EFFECT OF SYSTEMIC SEED DRESSING FUNGICIDES ON WHEAT INFECTION WITH COMMON BUNT (*TILLETIA CARIES* AND *T. FOETIDA*). S. Asaad¹, A. Yahyaoui¹, B. Attar², S. Koudsea² and M. Naimi¹. (1) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: s.asaad@cgiar.org; (2) Faculty of Agriculture, Aleppo University, Aleppo, Syria.

The effect of seed dressing of nine wheat cultivars different in their susceptibility to bunt and artificially inoculated with two inoculum levels of common bunt (*Tilletia caries* and *T. foetida*) in addition to a non-inoculated check was tested at Tel-Hadya station, ICARDA, Syria where eleven systemic fungicides were applied: CELEST EXTRA 050 FS, CELEST M 025 FS, Raxil 25 FS, Alios 300 FS, WAKIL XL 32.5 WG, APRON XL 350 ES, DIVIDEND STAR 036 FS, DIVIDEND 030 FS, Horizon, and Vitavax200 SS. Water was used as a check treatment. Field results showed that seed treatment with each of DIVIDEND STAR 036 FS, DIVIDEND 030 FS and CELEST EXTRA 050 FS provided complete control of bunt (*Tilletia caries* and *T. foetida*), compared to the check treatment (72%). However the fungicide CELEST M 025 FS provided the lowest level of control (53%) after the check. Field results also showed that between the tested susceptible cultivars, the durum wheat (Sham1) was the most susceptible variety followed by the spring bread wheat (QIMMA-10) then by the facultative bread wheat (GUN) at 72, 40 and 6%, respectively.

F 60

IDENTIFICATION OF WHEAT LEAF RUST (*PUCCINIA TRITICINA*) PHYSIOLOGICAL RACES IN SYRIA. Amor Yahyaoui, Najla Marrawi and Munzer El-Naimi, ICARDA, P.O.Box 5466, Aleppo, Syria, Email: m.naimi@cigar.org

Leaf rust, caused by *Puccinia triticina* is an important disease affecting wheat worldwide. Frequent appearance of leaf rust in Syria in the last years could indicate change in the rust pathotypes, hence a study on the identification of physiological races was conducted during two consecutive seasons (2004 and 2005). Infected leaf samples were collected from farmers' wheat fields in nine different areas in Syria. Purification and increase was done under controlled environment; spores originating from single uredia were tested on a set of 16 near -isogenic differential wheat lines. Physiologic races were determined using virulence/ avirulence phenotypes on differentials. Sixty eight races were identified. Four races BBBB, BLBL, PSTQ and BBBC, were found in more than one area, two races BLBL and PSTQ were found during the two seasons. The diversity in composition of the races was apparent between different areas.

F 61

DISTRIBUTION OF WHEAT ROOT ROTS IN NORTH EAST OF SYRIA AND DETERMINING THEIR CAUSAL AGENTS. Omran Youssef¹, Halim Youssef¹, Safia Al Masri² and Adnan Nehlawi². (1) The General Commission of Scientific Agricultural Research (GCSAR), AL Qamishli Agricultural Research Centre, Al Qamishli, Syria, Email: om_youssef@yahoo.com; (2) The General Commission of Scientific Agricultural Research (GCSAR), Administration of Plant Protection Research, Douma, P.O. Box 113, Damascus, Syria.

Field survey was conducted during 2003-2004 in wheat fields of north east of Syria to determine the distribution of wheat root rots and to identify their causal agents. The results showed that wheat root rots are mostly caused by more than on species of the genera *Fusarium* and *Helmenthosporium*. The predominant species were *F. culmorum*, *F. graminearum* and *H. sativum* ranking 56.8%, 30.93% and 26.13%, respectively. The root rot disease reached 26.67% in 2003 and 34.0% in 2004, with highest rate of infection on durum wheat (1.7) and bread wheat (0.8) based on a 0-3 scale. Results of infection ability proved that not all isolates were able to cause the disease solitary and there was a positive correlation between the growth speed of the fungal colonies of the tested isolates and their ability to cause infection.

F 62

MOLECULAR CHARACTERIZATION OF *PYRENOPHORA GRAMINEA* ISOLATES AND THEIR INTERACTIONS WITH BARLEY. Mohammed Imad Eddin Arabi and Mohammed Jawhar. Department of Molecular Biology and Biotechnology, Plant Pathology Division. AECS, P.O. Box 6091, Damascus, Syria, Email: miaraabi@aec.org.sy

IGS-RFLP, RAPD and SDS-PAGE markers were used to analyze genetic variability among *Pyrenophora graminea* isolates collected from diverse regions of Syria. In addition, the disease interactions with barley were studied using *in vitro* quantification and SDS-PAGE electrophoresis. The intergenic spacer (IGS) region was variable among isolates and different unique haplotypes were detected. However, the molecular parameters used showed that *P. graminea* was highly variable and there was limited resolution between clustering of isolates and their origin which suggests a regional dispersal of this pathogen. On the other hand, In quantification of barley - *P. graminea* interaction based on the percentage of inoculated seeds that gave out fungal hyphae cultured on potato dextrose agar media showed that there was high correlation ($r = 0.97$, $P < 0.05$) among the different *in vitro* experiments, indicating that this testing procedure is repeatable, and the evaluation of reaction of all genotypes to *P. graminea in vitro* tests was in agreement with its evaluation in field experiments. In order to better understand this disease and its genetic interactions with barley, SDS-PAGE electrophoresis, hordein patterns (groups D, C and B) of five barley cultivars inoculated with selected isolates were investigated. Results showed the absence of particular hordein subunits and the degradation of others in most of the cultivars inoculated with virulent isolates. However, a complex interaction pattern was realized between isolates x cultivars with variable virulence and resistance levels, respectively. Identical numbers of polymorphic bands were observed through the different assays (for each isolate/cultivar). Moreover, since single seed tests showed no differences in the hordeins profiles of the non-infected seeds, we presumed that the changes in the hordeins profiles of the infected seeds were due to the

infection with *P. graminea*. The protein profiles were highly repeatable. This reproducibility is encouraging further analysis to identify protein complexes that might contain host defense proteins and pathogenicity factors.

F 63

SEED BORNE DISEASES OF SOME CEREAL CROPS IN YEMEN. Najeeb Ahmed Mohsem Salam, Nasir's college of Agriculture, University of Aden, Yemen, Email: Najeebcurd2009@yahoo.com

The present study aimed to survey Fungi and Bacteria on seeds of 8 cultivars of wheat (*Triticum aestivum* L.) from Hadramout valley, 6 cultivars of sorghum sp (*Sorghum bicolor* L.) and 2 cultivars of Maize (*Zea mays* L.) from Delta Tuban in Laheg Governorate of Yemen. Assays detected fungi of the following genera on wheat, sorghum and maize seed: *Aspergillus*, *Alternaria*, *Cladosporium*, *Fusarium*, *Curvularia*, *Drechslera*, *Penicillium* and *Rhizopus* and two bacterial genera *Xanthomonas* and *Pseudomonas*. The same genera were found on sorghum in addition to *Cladosporium* and *Cercospora*. In maize, all above genera were detected in addition to *Machrophmina*. Goniemy wheat cultivar was the least contaminated (25%), and has high tolerance to salinity and resistant to lodging. The sorghum cultivar Haig showed highest level of contamination (35.8%), whereas the least contaminated was cv. Buini (25%). In maize seeds, cv. Kanja was less contaminated (36%) than the American badree. The association of these fungi with seeds reduced their germination rate. The germination rate using blotter method was 86.4% for wheat, 83.5% for sorghum, 86.5% maize. The symptoms associated with seedlings of wheat, sorghum and maize were seed rot, root rot, blight and wilt. All these symptoms were more clear at the seedling stage. The pathogenicity of *X. campestris* on wheat, sorghum and maize seedlings was visible as elongated spots at the tip of the leaf. It started as yellow and changed into a brown color with bacterial sticky ooze. Pathogenicity of *Pseudomonas* sp. on wheat, sorghum and maize seedlings was observed as irregular spots at the tip of the leaf it started as yellow, changed into whitish or brown color with bacterial sticky ooze which changed with time into transparent crust.

F 64

EFFECT OF CALCIUM SALTS ADDED TO SOILS INFESTED WITH SOME FUNGI ON THE INCIDENCE OF SOYBEAN DAMPING-OFF. M.K.M. Arafat, N.M. Abou-Zeid and M.M. Hassanein, Shandaweel Research Station, Egypt, Email: nashat_hafiz@yahoo.com

Calcium oxide (CaO) and calcium hydroxide $\text{Ca}(\text{OH})_2$ treatment significantly reduced preemergence damping-off and diseases severity incidence of Clark soybean cultivar caused by *Rhizoctonia solani* in artificially infested soils (loamy sand and sandy loam) in greenhouse. Disease reduction was comparable to that achieved with Vitavax 200 as seed treatment. Damping-off disease of three cultivars of soybean, and one cultivar of pea, sugar beet, and bean in soils artificially infested *R. solani*, and disease incidence of *R. solani* and *Fusarium solani* infested loamy sand soil were significantly decreased and survival plants were also increased when 0.02% CaO was added to the soils. Field studies (1999 and 2000) on the cultivars tested confirmed that damping-off disease control, and increase in survival plants were significantly greater when Vitavax 200-treated seed was planted in CaO amended soil than when either treatment was used individually. CaO decreased population of each *R. solani* and *F. solani* in the naturally infested sandy loam soil, especially, when it was added to the soil at a rate of 0.03%. Adjustment of cron meal agar medium (CMA) to high pH values, similar to those of CaO amended-soils, did not affect radial growth of *R. solani*, *F. solani*, and *Pythium ultimum* or their chlamydospores and sporangia, respectively. However, ammonia vapors arising from ammonium hydroxide solutions or from inorganic nitrogen salts in the soil, which killed *F. solani* chlamydospore and *P. ultimum* sporangia.

F 65

IDENTIFICATION OF SEED BORNE FUNGI ASSOCIATED WITH SOME LEGUMINOUS SEEDS IN IRAQ AND THEIR CONTROL. A.R.T. Sarhan, Department of Biology, College of Science, University of Al-Qadisiya, Diwaniya, Iraq, Email: artsarhan@yahoo.com

Laboratory studies on the effect of seed-borne fungi on seeds germination and seedlings growth of some leguminous crops in Diwaniya, Iraq (bean, broad bean, cowpea, chickpea, green gram, lentil and pea) were conducted. Representative subsamples were examined by the regular blotter and agar plating methods

and microscopical identification indicated the presence of some fungi on all legume seeds. Assays, one week after incubation detected fungi that belong to 15 genera associated with legume seeds, i.e. *Alternaria*, *Aspergillus*, *Ascochyta*, *Botrytis*, *Chaetomium*, *Cladosporium*, *Drechslera*, *Fusarium*, *Geotrichum*, *Macrophomina*, *Penicillium*, *Rhizoctonia*, *Rhizopus*, *Stemphylium* and *Verticillium*. The rate of seed infection and seed germination of each sample was calculated, and significant differences were observed among different crops. Fungi incidence associated with legume seeds ranged from 0-42%. *Fusarium* spp. were the most prevalent fungi isolated. They caused seed rot, seedling mortality and wilt. The best treatment for reducing seed rot, seedling disease, seedling mortality and improving seedling growth was a biological seed treatment with a mixture of two species of the antagonistic fungus *Trichoderma* spp.

F 66

GENETIC VARIABILITY AMONG SOME EGYPTIAN AND SYRIAN ISOLATES OF *FUSARIUM OXYSPORUM* f.sp. *CICERIS*. Salah Abdel-Momen¹, Ismail Al-Mohamed² and Bassam Bayaa³. (1) Plant Pathology Research Institute, Agricultural Research Center, Giza, Egypt, Email: Salah1993@yahoo.com; (2) Plant Protection Department, Faculty of Agriculture, Al-Baath University, Syria, Email: ismail_path@yahoo.com; (3) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: b.bayaa@cgiar.org

Genetic variability among 39 isolates of *Fusarium oxysporum* f.sp. *ciceris*, the causal organism of chickpea vascular wilt, was determined using the random amplified polymorphic DNA (RAPD) technique. Thirty five isolates were from eight governorates of Egypt and the extracted DNA for three isolates from Syria and one from Lebanon. The banding patterns generated from those isolates by six primers showed different levels of genetic variability among and within isolates from the different geographical locations for the Egyptian isolates but not for the Syrian ones as similarity was more than 90%. On the other hand, inconsistent results were observed between the Lebanese isolate and one of the Syrian isolates (ICARDA's sick plot) with the used primers. Moreover, the internal transcribed spacers (ITS 1,2) and (ITS 1,4) were used with 12 out of the 39 isolates including the Syrian and Lebanese isolates trying to detect more genetic variability. ITS 1,2 gave a single and unique band (235bp) while the ITS 1,4 gave another single unique band (556 bp) with no genetic variability among the isolates tested.

F 67

LENTIL WILT IN NORTH-WESTERN ALGERIA. Lakhdar Belabid¹, Michael Baum², Zohra Fortas³, Zouaoui Bouznad⁴, Imad Eujayl² and Miloud Bellahcene³. (1) LRBSG, B.P. 763, Mascara, Algérie. (2) ICARDA, Biotechnology Lab., P.O. Box 5466, Aleppo, Syria; (3) Laboratoire de Biologie des Microorganismes et Biotechnologie, Département de Biotechnologie, Faculté Des Sciences, Université d'Oran, Es-Sénia, Algérie; (4) Laboratoire de Phytopathologie et Biologie Moléculaire, Institut National Agronomique, El-Harrach, Alger, Algérie.

Lentil is one of the most important pulse in Algeria. Recent observations indicated an increased incidence of wilt and root rot associated with *Fusarium* species. A pathogenicity test confirmed that lentil vascular wilt caused by *F. oxysporum* f. sp. *lentis* (FOL) is considered as the major disease affecting lentil in Algeria. It causes significant economic losses. Thirty-two isolates of FOL were obtained from wilted lentil plants collected from different lentil growing areas in north-western Algeria. To differentiate between isolates, different criteria were used: variation in some cultural, physiological, biometrical characters and pathogenicity (virulence and aggressiveness). Isolates were also assessed for vegetative compatibility (VCG) using nitrate non-utilizing mutants and examined for genetic diversity with random amplified polymorphic DNA (RAPD) and amplified fragment length polymorphism (AFLP) markers. Results showed that all the FOL isolates present important cultural variation and pigmentation of colony in Petri dish. The biometrical characters revealed the dominance of microconidia/macroconidia. A significant correlation was found between aggressiveness and the microconidia width and the colony diameter in Petri dish. The FOL isolates represented a single race but differed in their aggressiveness on susceptible lines. In the vegetative compatibility test, three types of *nit* were obtained (*nit-1*, *nit-3* and *Nit-M*) on the basis of the phenotype. *Nit-1* mutants were the most frequent (63%), followed by *Nit-M* (31%) and *nit-3* (6%). On the basis of their ability to form heterokaryons, all the lentil pathogenic isolates were grouped into a single VCG-0471. This is an indication of the homogeneity of the Algerian FOL population. The amount of genetic variation was evaluated by PCR amplification with a set of 6 RAPD primers and 3 AFLP selective nucleotide primer pairs.

All amplifications revealed scorable polymorphisms among the isolates, and a total of 8 polymorphic fragments were scored for the RAPD primers and 93 for the AFLP primers. Genetic similarity between each of the isolates was calculated by using the Jaccard similarity coefficient and cluster analysis was used to generate a dendrogram showing relationship between them. The isolates could be grouped into two subpopulations based on RAPD and AFLP analysis. Results obtained indicated that there is little genetic variability among a subpopulation of FOL as identified by RAPD and AFLP markers and that there is no apparent correlation with geographical origin and aggressiveness of isolates.

F 68

DISTRUBUTION OF THE MATING TYPES OF SEXUAL AND THE TELEMORPH OF *ASCOCHYTA RABIEI* ON CHICKPEA IN ALGERIA. M. Khouaidjia¹, L. Bouabdallah¹, Z. Bouznad² and M. Labdi³. (1) Microbiology Lab., Biology Department, Faculty of Sciences, University of Oran, Algeria, Email: Khouaidjia_malika@yahoo.fr; (2) INA, El-Harrash, Alger, Algeria; (3) INRA, Sidi Bel Abbas, Algeria,

Ascochyta rabiei is the causal organism responsible for the chickpea blight disease. This pathogen is present in all areas where chickpea is cultivated. When the conditions are favorable for its development the yield can be seriously affected. The telemorph of *Ascochyta rabiei* (*Didymella rabiei*) was exploited for its significant role in the dispersion of pathogen over long distances, and for the genetic variability observed in the pathogen's populations. This variability is responsible for the failure of many resistant cultivars. A study on distribution of the mating types and the telemorph of *Ascochyta rabiei* was carried out *in vitro*. Thirty isolates of *Ascochyta rabiei* collected from the various chickpea production areas were crossed with the two mating types (Mat 1: 1 and Mat 1:2). The telemorph of *Ascochyta rabiei* was obtained *in vitro*, thus confirming the presence of the two mating types in Algeria. The distribution of the two mating types is variable based on the geographical area and the year of isolation.

F 69

DETECTION OF *PHYTOPHTHORA NICOTIANAE* FROM SOIL WITH SOYBEAN LEAF-DISK BAITING. A. Mohammadi and A. Alizadeh, Plant Pathology Department, Tarbiat Moddares University, Tehran, Iran, Email: moham_ab@modares.ac.ir

A high detection rate of *Phytophthora nicotianae* was obtained when air-dried, naturally infected soybean field soils in a flask were moistened and pre-incubated at 25°C for 2-4 weeks, flooded with 5-10 mm of distilled water, and then baited with soybean leaf-discs for 12 h. Distilled water was adopted to incubate the baited leaf discs. Sporangia emerging from the edge of the infected leaf discs were observed under stereo microscopy 72 h after incubation in distilled water. This technique was sensitive for the detection of *P. nicotianae* from soybean soil. For pure isolations, zoospore solution was spread on 1.5% water agar containing anti-bacterial antibiotics, and 24 h later the germinated zoospores were isolated and pure cultures were obtained. By using, this technique, six isolates were detected in 50 soil samples. All isolates were of the type A2.

F 70

FIRST REPORT OF *PHYTOPHTHORA SOJAE* RACE 1 FROM MOGHAN, IRAN. A. Mohammadi¹, A. Alizadeh¹, M. Mirabolfathi² and N. Safaie¹. (1) Plant Pathology Department, Tarbiat Moddares University, Tehran, Iran, Email: moham_ab@modares.ac.ir; (2) Plant Pest and Disease Research Institute, Plant Pathology Department, Iran.

Phytophthora root rot, caused by *Phytophthora sojae*, is a very destructive disease of soybean in Iran. Races of *P. sojae* have been identified from Lorestan and Golestan that are not controlled by the commonly used race-specific resistance genes in soybean. The prevalent races of *P. sojae* in Moghan are not known. The objective of this study was to isolate and identify races of *P. sojae* in the state of Moghan. Thirty isolates were obtained from infected plants and soil samples collected throughout Moghan in 2005 and were identified to race by inoculating Rps differential of the soybean cultivars. Most *P. sojae* isolates were race 1 that was virulent on Rps7. This is the first report of *P. sojae* and race 1 from Moghan. Use of a new soybean variety with Rps gene instead of Williams reduces severity of disease in Moghan.

F 71

PATHOGENIC VARIABILITY IN SYRIAN POPULATIONS OF *ASCOCHYTA FABAE* SPEG. AND IDENTIFICATION OF SOURCES OF RESISTANCE WITHIN SYRIAN LANDRACES. B. Bayaa¹, A. Sbeih², M. Hassan³, M. Kabakebji¹, S. Murad¹, M. Abang¹, S. Kabbabeh¹ and W. Ibrahim². (1) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: b.bayaa@cgiar.org; (2) GCSAR, Lattakia, Syria, Email: ali_sbeeh@hotmail.com; (3) Faculty of Agriculture, University of Tehrane, Lattakia, Syria.

Faba bean *Ascochyta* blight, caused by *Ascochyta fabae* Speg., is one of the most important fungal diseases affecting faba bean in Syria. The disease is responsible for considerable quantitative and qualitative yield losses. The perfect stage of the fungus was recently reported in Syria indicating a high evolutionary potential of the pathogen population. Understanding the variability of the *A. fabae* population in Syria is a prerequisite for effective host plant resistance, which constitutes a key component of integrated disease management. *Ascochyta*-infected faba bean samples were collected from different Syrian Governorates, followed by fungal isolation and morphological characterization of 184 isolates. Marked differences were observed in colony color and growth rate, as well as in sporulation, density and spore size. Pathogenicity tests of representative isolates were carried out under plastic house conditions using nine faba bean differential lines. Disease severity was evaluated on a 1-9 rating scale. Significant differences in virulence were found among isolates, with mean disease severity ranging from 2.0 to 6.3. Fifty faba bean landraces originating from Syria were evaluated for resistance to an equi-proportional mixture of five isolates. Disease severity was estimated using the same scale (1-9). Only two lines (BPL 1277 and BPL 2761) were identified as resistant with disease severity <3. The accessions identified as resistant could potentially constitute a valuable resource for breeding of *Ascochyta* blight-resistant germplasm. Molecular characterization of the isolates is on going.

F 72

INDUCED RESISTANCE OF FABA BEAN AGAINST RUST DISEASE USING ANTIOXIDANTS. Metwally A. Baraka¹, Nagi Abou-Zeid² and Mohamed Abdel-Azeem². (1) Faculty of Agriculture Suez Canal University, Egypt; (2) Plant Pathology Research Institute, Agricultural Research Center, Giza, Egypt, Email: nagiabouzeid@link.net

Faba bean rust, a disease caused by *Uromyces vicia fabae* (Pers) Schroet is very common in Egypt and other countries. It is considered the second destructive disease in the North Delta in Egypt causing yield reduction in yield quantity and quality. Induced resistance as a safe environmental control method to substitute, or at least to decrease the use of pesticides in plant disease control. Under greenhouse conditions at Giza Agric. St., seven antioxidants in three concentrations were evaluated against faba bean rust disease as a foliar spray, 24 hrs before artificial inoculation. The results indicated that all tested inducers significantly reduced the disease severity compared with the control. Under field conditions at Sakha Agriculture Research Station (Kafre El-Sheikh Governorate), Egypt, two inducers i.e. sodium disulphate and tri sodium citrate and two bio fungicides i.e. Bio Arc (*Bacillus megaterium*) and Bio Zeid (*Trichoderma album*) were used as a foliar spray on faba bean plants c.v.s. Sakha 3 and Yousef El-Sedeek during 2003/2004 and 2004/2005 seasons. All treatments significantly decreased the disease severity and increased the seed yield in the two seasons compared with the control. Results of these experiments will be reported.

F 73

SIGNIFICANCE OF FUNGICIDE APPLICATION DURING INCUBATION PERIOD ON BIOMASS AND SEED YIELD OF ASCOCHYTA BLIGHT ON CHICKPEA. Roula Shamsi¹, Ahmed El-Ahmed¹, Rajender Malhotra² and Yonis Idrees³. (1) Aleppo University, Aleppo, Syria; (2) ICARDA, P.O. Box 5466, Aleppo, Syria; (3) General Organization of Remote Sensing, Damascus, Syria, Email: r.shamsi@hotmail.com

Chickpea (*Cicer arietinum* L.) is one of the most important cool season food legumes grown in West Asia and North Africa. The production of chickpea is seriously constrained by a devastating disease, *Ascochyta* blight, caused by *Ascochyta rabiei* (Pass) lab. Occasionally, in epidemic form when the environmental conditions favor the development and spread of the disease, it causes heavy yield losses, or even crop failures. The present study was conducted on integrated disease management using host resistance as well fungicide control with the objective to evaluate the response of the fungicide application on both

biomass and seed yield of chickpea. Results indicated that fungicide application during incubation period (Date 1) was the most effective compared to other dates (Date 2: at symptoms appearance, or Date 3: 10 days after disease development). Spray during the incubation period decreased the infection rate from 100% for infected treatment (either no fungicide application or fungicide spray at Date 2 or at Date 3 or Date 2 + Date 3) to 16.5% when sprayed with fungicide at incubation period (Date 1) or to 14.8% with (Date 1 + Date 2) or even to 11.3% with (Date 1 + Date 2 + Date 3). Results also revealed that fungicide application during incubation period (Date 1) resulted in significant increase in biomass and seed yield production either with one or two sprays (Date 1 + Date 2 or Date 1 + Date 3 or Date 1 + Date 2 + Date 3). These sprays resulted in high seed yield (3299–3429 kg/ ha), and biomass yield (6408–6912 kg/ ha). On the contrary, when fungicide was not applied or applied at symptoms development (Date 2) or 10 days later (Date 3) both biomass (5537–6265 kg/ ha) and seed yield (2646–2946 kg/ ha).

F 74

ASCOCHYTA BLIGHT in CHICKPEA VARIETIES with VARYING LEVELS OF TOLERANCE. Brakat Rahmoun¹, Abdul Aziz Niane² Bassam Bayaa² Mahmoud Hassan³, Zewdie Bishaw² and Siham Kabbabeh². (1) GOSM, Idlib; (2) ICARDA, P. O. Box 5466 Aleppo, Syria; (3) Tishreen University, P.O. Box 2233, Lattakia, Syria, Email: b_rahmon@scs-net.org

Ascochyta blight (AB), caused by *Ascochyta rabiei* (Pass) Lab., is a major disease of chickpea (*Cicer arietinum* L.) world wide. A green house trial was conducted to evaluate the combined effects of fungicidal seed treatment and host plant resistance in minimizing the number of foliar sprays needed to protect the crop from the disease and reduce yield loss. Results obtained showed that Ascochyta infection on chickpea seeds, significantly ($P<0.05$) reduced rate of seed germination in the susceptible (local) and the moderately tolerant (Ghab-2) varieties, but not in the highly tolerant one (Ghab-3). The mean germination rate of healthy seeds of the local, the moderately and the highly tolerant varieties were 97%, 96% and 99% compared to 65%, 87% and 98% for the infected seeds, respectively. Seed dressing with systemic fungicides significantly ($P<0.05$) increased the germination rate of the infected seeds compared to the susceptible (local) and moderately tolerant cultivar (Ghab-2). The mean germination for the treated infected seeds from the local, the moderately and the highly tolerant varieties were 73, 92 and 100% compared to 57, 83 and 97% for the non-treated infected seeds, respectively. The overall mean germination for the seeds treated with difenoconazole and thiram 20% + carboxin 20% were 94% and 92%, respectively, compared to 88% for the control. Moreover, seed dressing with thiram 20% + carboxin 20% significantly ($P<0.05$) reduced Ascochyta blight severity up to 45 days after emergence. The mean disease severity of plants from treated seeds of the local and moderately tolerant (Ghab-2) varieties were 6.25 and 5.86 compared to 7.00 and 6.62 for plants from non-treated seeds, respectively. The biological yield harvested from plots where seeds were treated with thiram 20%+carboxin 20% was 3.65 g/plant compared to the control with 3.16 g/plant. This represented a significant ($P<0.05$) increase of 13%. Foliar applications of chlorothalonil or azoxystrobin significantly reduced Ascochyta blight, and the low disease severity scores did translate into an increase in chickpea yield. Disease severity ranged from 6.93 for the control to 2.56 and 3.48 for the plots sprayed twice with azoxystrobin and chlorothalonil, respectively. The yield was 2.38 g/plant in the control compared to 4.74 g/plant (46% increase) for the plots sprayed twice with azoxystrobin, and 3.94 gm/plant (40% increase) for the plots sprayed twice with chlorothalonil.

F 75

DETERMINATION OF GENETIC VARIATION AMONG THE ROOT ROT ISOLATES OF *FUSARIUM SOLANI* IN CHICKPEA BY THE USE OF AFLP MOLECULAR MARKERS. F. Hasanzadeh¹, M. Flahaty Rastegar¹, B. Jafarpour¹ and M. Eskandari². (1) Department of Plant Protection, Collage of Agriculture, Ferdowsi University of Mashhad, Iran; (2) Plant Pests and Diseases Research Department, Agricultural and Natural Research Center of Khorasan, P.O. Box 91775-1163, Iran, Email: fatia1662@yahoo.com

Sixty seven isolates of *Fusarium solani* were obtained from infected plant samples collected from major chickpea growing areas in north eastern Iran. The main characteristics of the fungus is having long phialids and producing cream and occasionally green color sporodochia on CLA. Isolates were kept in SNA and makarti glasses containing sterile sand for short and long periods, respectively. A pathogenecity test was

performed on all isolates. The DNA extraction was carried out on 30 isolates. AFLP molecular markers were used to determine genetic variation. Results obtained showed high genetic variation. The markers cluster dendrogram analysis did not show any genetical correlation for regional and climatical factors. Results of the present study provided evidence for the high discrimination power of AFLP analysis, and suggested the possible applicability of this method to the molecular characterization of *Fusarium*.

F 76

FUNGAL DISEASES OF ORNAMENTAL PLANTS: EVOLUTION OF DISEASES AND THEIR MANAGEMENT. Maria Lodovica Gullino and Angelo Garibaldi, Centre of Competence for the Innovation in the agro-environmental sector, University of Torino, Via Leonardo da Vinci 44, 10095 Grugliasco, Italy, Email; marialodovica.gullino@unito.it

The production of ornamental plants is a thriving and expanding industry, economically important in many industrialized as well as developing countries. It stands out in the agricultural scenario for the frequency and rapidity of changes in type of product, in the technology adopted as well as in production areas. It includes deciduous and evergreen trees, woody ornamentals, shrubs, nursery crops, foliage plants, cut flowers, flowering potted plants, bedding/garden plants, potted bedding and garden plants, herbaceous perennials, cut cultivated greens as well as propagation material. The world floricultural export market was valued in 2003 at approximately 18 billion Euros. During the last few decades significant changes occurred, with many new crops being introduced, new products such as pot plants partially replacing cut flowers, improved techniques for growing, treating and handling plants being implemented, new production areas emerging. Such changes had a profound influence on disease development and on their management. The main reasons of such evolution are critically analysed, with many practical examples.

Bacterial Diseases

B 1

CROWN GALL DISEASE IN JORDAN. Hamed Khlaif, Plant Protection Department, Faculty of Agriculture, Jordan University, Amman, Jordan, Email: h-khlaif@ju.edu.jo

Crown gall disease caused by the bacterium *Agrobacterium tumefaciens* is a widely spread disease in the trees growing areas in Jordan. In the last few years the disease spread further with the expansion of the area planted to fruit trees in the country. Tumorigenic *Agrobacterium* was isolated from the following hosts: Stone fruits (Bitter Almond, Peach, Nectarine, Plum, almond, cherry, apricot, GF677, and GF 305). Pome fruits (Apple, Pear, Quince, and MM106), Grapes, Olives, Pomegranate, Carobbean, and Roses. The isolates were biochemically and physiologically characterized, and pathogenicity was determined by artificial inoculation to tomato (*Lycopersicum esculantum* cv. Maramand) and *Kalanchoe* seedlings, and through the detection of tmr gene by PCR. Results showed that 60.5% of the isolates belonged to Biotype 1, isolated mainly from stone fruits, olive, carobbean, pomegranate and roses; 23.5% of the isolates belonged to Biotype 2, isolated from stone fruits and pome fruits; 1% of the isolates belonged to Biotype 3, isolated from grapes only. 15% of the isolates did not belong to any of the three Biotypes and placed into an intermediate Biotype. 77% of the tested isolates were sensitive to agrocin 84, and 66% of them belonged to biotype 1. The results of artificial inoculation to different stone fruits: GF 677, Montcar, Mariana, wild apricot, bitter almond, and Myrobolan, showed that all the rootstocks tested were found to be susceptible to the disease at various degrees, with GF 305, GF 677 being highly susceptible in comparison to Myrobolan which showed less susceptibility. Soil solarization reduced the population of *Agrobacterium*, and the reduction was found to be correlated with soil type and temperature. In Jordan valley, 99% reduction in the population occurred during the 1st three weeks after solarization in clay soil, where average soil temperature was in the range 39–51°C during the solarization period. This led to a reduction in galled seedlings of bitter almond and GF 677 by 89–94%. Soil solarization was more effecient in the Jordan valley than in the uplands. In biocontrol experiments, the extracts of *Bacillus subtilis*, *penicillium* sp., K84, K 1026, and *Trichoderma harzianum*, in addition to garlic extract, proved to be highly efficient in *Agrobacterium* growth inhibition in plates as well as on preventing tumor formation on tomato and GF 677 seedling roots, when their roots were dipped in the suspension of the tested bioagents before inoculation with the suspension of tumorigenic *Agrobacterium*.

B 2

ISOLATION AND IDENTIFICATION OF THE BACTERIUM CAUSING SPOT DISEASE ON CANE-APPLE (*ARBUTUS PAVARII* PAMPANINI) IN JABEL EL-AKHDAR AREA, LIBYA.

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A survey carried out from 2004 to 2005 in Jabel El-Akhdar area – Libya, revealed the wide spread of leaf spot disease on Cane-Apple (*Arbutus pavarii* Pampanini) that grow naturally in El-gabal Al-Akhder area. The preliminary results showed that the incidence of this disease in different regions varied. The results of cultural, morphological, physiological and biochemical tests of the different isolates proved that the causal agent of the disease is the bacterium *Pseudomonas syringae* pv. *syringae*. These results were confirmed by pathogenicity test.

B 3

IDENTIFICATION OF *RALSTONIA SOLANACEARUM* ISOLATED FROM POTATO TUBERS, WEEDS, WATER AND SOIL IN EGYPT. M.R.A. Tohamy¹, M.M.M. Atia¹, Faiza Fawzi Gabriel² and Hanaa A. Mater².

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Brown rot or bacterial wilt of potato caused by *Ralstonia solanacearum* is one of the most important quarantine diseases world wide and in Egypt. Isolation and identification of the causal organism from different sources using rapid and accurate methods was carried out. Results revealed that, among 200 collected samples, 20 were pathogenic and were detected from potato tubers, weeds, water and soil. Fifteen isolates were isolated from Mounfia governorate, five from El-Gharbia and non from El-Sharkia (Salhia free area). Pathogenicity of these isolates was confirmed on tomato seedlings. Soil isolates (No. 1 and 2), tuber

isolates (No. 8) and water isolates (No. 12) showed the highest disease severity on tomato seedlings. The aforementioned twenty pathogenic isolates were identified as *Ralstonia solanacearum* Race 3, Biotype 2 according to their biochemical, and physiological properties, growth on King's B and SMSA media, Immunofluorescence antibody assay (IFAS), Fatty acid assay, DNA assay using PCR and Box-PCR. *Ralstonia solanacearum* the causal organism of potato brown rot could be stored for three months at pH 7 and 15°C.

B 4

EVALUATION OF PATHOGENICITY OF DIFFERENT *ERWINIA* ISOLATES CAUSAL AGENTS OF POTATO SOFT ROT AND BLACKLEG, AND ASSESSMENT OF SUSCEPTIBILITY OF SOME POTATO CULTIVARS UNDER LABORATORY CONDITIONS. S. Nabhan¹, S. Al-Chaab¹ and M. Abu-Ghorrah². (1) General Commission of Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria, Email: shaza77@maktoob.com; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, Damascus, Syria.

During 2004, the pathogenicity of thirty local *Erwinia carotovora* subsp. *atroseptica*, *E. carotovora* subsp. *carotovora* and *E. chrysanthemi* isolates (10 isolates each) was evaluated under laboratory conditions by using similar number of potato tuber slices (10 slices from each cultivar for each isolate) of ten locally grown potato cultivars. Results showed clear differences in symptoms and diameter of rotted tissue caused by the three tested bacterial species/subsp. *E. chrysanthemi* was the most aggressive, with a significant increase of rotted tissue observed on potato tuber slices in comparison with those caused by *E. carotovora* subsp. *atroseptica* and *E. carotovora* subsp. *Carotovora*, followed by *E. carotovora* subsp. *carotovora* which was not significantly more aggressive than *E. carotovora* subsp. *atroseptica*. Six out of ten tested *E. chrysanthemi* isolates showed high or very high aggressive levels against potato tuber slices of the tested cultivars, but half of *E. carotovora* subsp. *carotovora* isolates got the same level of aggressiveness. Meanwhile, aggressiveness of three out of ten *E. carotovora* subsp. *atroseptica* isolates was high. The susceptibility of tested tuber slices of potato cultivars to soft rot disease caused by different isolates of tested bacteria varied. The cvs. Draga, Diamant and Anna were significantly the most resistant in comparison with Arenda, Lezetta and Nicola cultivars. The Marfona was resistant to *E. carotovora* subsp. *atroseptica* isolates only, whereas Diamant, Agria and Draga were moderately susceptible to *E. chrysanthemi* bacteria. Slightly susceptible or resistant cultivar to *E. chrysanthemi* isolates was not recorded.

B 5

ISOLATION AND CHARACTERIZATION OF STRESS TOLERANT STRAINS OF *SINORHIZOBIUM MELILOTI*. Faws Abdul-Salam Al-Safar and Raad Hassani Sultan, Department of Biology, College of Education, University of Mosul, Mosul, Iraq, Email: raadsultan@yahoo.com

Twenty four strains of *Sinorhizobium meliloti* were isolated from root nodules of alfalfa plants, which were collected from different agroclimatic regions of Ninawah state-Iraq. Five strains viz., FA7, FA8, FA10, FA11 and FA12 were found tolerant to pH 4.5, 6% NaCl and 8% K₂SO₄. All the five strains were able to grow on Rhizobial Minimal Medium. The five studied strains showed multiple antibiotic resistance. Among these strains, FA8 and FA7 were the most efficient in nitrogen fixation based on mean values of dry shoot weights. pH changes in MSY liquid medium revealed changes towards acidity. The number of colony forming units (CFU) was reduced under stress in comparison with normal conditions. Production of cell surface molecules of these five strains was also studied.

B 6

DEVELOPMENT OF A SENSITIVE TEST FOR THE DETECTION OF LEAF BLIGHT BACTERIA IN RICE. Abdalla M. Abdelmonem, Mohamed R. Rasmy and Rania Z. El-Shennawy, Plant Pathology Research Institute, Agricultural Research Center, P.O. Box 12619, Giza, Egypt, Email: dimamt@yahoo.com, dimam@link.net

Polymerase chain reaction (PCR) was tested for selective detection of the causal agent of bacterial leaf blight of rice, *Xanthomonas oryzae* pv. *oryzae*. The efficiency and reliability of PCR were compared with those of dot immunobinding assay (DIA), ELISA and classical isolation techniques for detecting bacteria in suspensions of pure cells and extracts of field-collected leaf samples of rice. In addition, when

classical PCR and BIO-PCR (biological amplification followed by PCR) were compared with isolation on a semi-selective agar medium, classical PCR and BIO-PCR techniques had the advantage of not requiring pathogenicity tests to confirm the identity of colonies tentatively identified as *X. oryzae* pv. *oryzae* on XOS and mXOS agar medium. The mXOS medium and BIO-PCR techniques were the most sensitive, however, the former technique required seven days whereas the latter needed only four days. The BIO-PCR technique was as sensitive as the semi selective medium technique and eliminated the need to conduct any additional tests to confirm the identification.

B 7

FIRST RECORD OF *XANTHOMONAS* SP. ON CUMIN IN SYRIA. Mustafa Bellar and Mazen Bellar, Bellar's Plant Protection Center, Hamidiyeh, Said Ali, Kasyoun, P.O. Box 10444, Aleppo, Syria.

During the 1996, 1997 and 2001 cropping seasons a quantitative survey for the distribution and identification of cumin blight disease was conducted in the main cumin growing areas of Syria. The field work covered 340 locations of 161 villages in two climatically different zones. Cumin blight disease was widely spread in Syria with high severity in north western, central and northeastern regions, but rare in north western and southern areas of Aleppo, Idleb, Hama and Homs provinces in north and central Syria. Disease incidence ranged from 30% to 70% in the different locations. Yield loss estimate under natural infection conditions was 72, 63, 48 and 43% in Idleb, Aleppo, Homs and Hama, respectively. Cumin planted at the farmer's field is Saraqeb (Idleb) showed severe leaf blight symptoms on leaves and flowers during spring (March, April) 1996 and 2001. The affected plants produced translucent spots on leaves, which were watery at start, turned yellow later and finally became brown. Diseased leaves consistently secreted yield yellow pigmented. Results of isolation, pathogenicity, cultural, biochemical, biological and microscopic tests on the isolated organism and the chronology of disease symptoms, developed in the field, plastic house and laboratory, revealed that the causal organism is the bacterium *Xanthomonas* sp.

B 8

WHEAT AND BARLEY BLIGHT AND LEAF AND SPIKE TWIST CAUSED BY *CLAVIBACTER TRITICI* IN NORTHERN SYRIA. Mustafa Bellar, Bellar's Plant Protection Center, Hamidiyeh, Said Ali, Kasyoun, P.O. Box 10444, Aleppo, Syria.

Barley and wheat planted at farmers' fields in Menbej, Jarablos and Al-Hader of Aleppo Province in Northern Syria, showed severe leaf blight and spike and leaf twist symptoms during spring (March-April) 1995, 1996, 2004 and 2005. The symptoms observed were mainly bright yellow exudates on the spikes which is an indicative of bacterial spike blight. When dry, the exudates make a thin transparent layer on the spikes. The young leaves may also be wrinkled or twisted. This bacterium is associated with the nematode *Anguina tritici* in some grains. However, the disease occurs some times in the absence of the wheat and barley nematode. The infective pathogen was isolated and its general morphological, cultural, physiological and biochemical characters were studied. The results indicated that the recovered isolates from the infected plant spikes belong entirely to *Clavibacter tritici* (*Corynebacterium tritici* Hutch) Burk. Pathogenicity and susceptibility studies carried out in the plastic house under artificial inoculation indicated that the most susceptible barley variety was Arabi Aswad followed by Tadmor and Zanbaka, and the least susceptible were Rihan and Arta followed by Arabi Abiad. The reaction of six wheat cultivars to the disease revealed that Cham 6 and Bohous 6 were the most susceptible, whereas other cultivars showed different degrees of susceptibility (Cham 4, Cham 3, Cham 5 and Bohous 5).

B 9

QUANTITATIVE SURVEY AND POTENTIAL YIELD LOSSES DUE BACTERIAL WHEAT AND BARLEY BLIGHT AND LEAF SPIKE TWIST CAUSED BY *CLAVIBACTER TRITICI* IN NORTHERN SYRIA. Mustafa Bellar, Bellar's Plant Protection Center, Hamidiyeh, Said Ali, Kasyoun, P.O. Box 10444, Aleppo, Syria.

During the cropping seasons of 1995, 1996, 2004 and 2005 a quantitative survey on the distribution and identification of wheat and barley blight and leaf and spike twist disease was conducted in the main wheat and barley growing areas of northern Syria. The survey covered 606 and 376 barley and wheat fields, respectively, in 17 counties and 7 districts in two climatically different zones. The leaf blight and leaf and

spike twist diseases on barley and wheat are widely spread in northern Syria, with high severity in northern and north eastern and southern areas. Percentage of infection were 10, 14, 14, 12, 14, 18, 16, 8, and 6% in barley and 10, 8, 14, 10, 24, 16, 28, 8, and 8% in wheat Ain Al-Arab, Sheiyoukh, Jarablos, Zirbeh, Al-Hader, Esfireh, Al-Ray and Al-Bab, respectively. Average yield loss in bread wheat (Sham 6) fields due to the bacterial *clavibacter tritici*, the nematode *Anguina tritici* and both was 18.7, 38 and 56.1% respectively, and in barley (Arabi Aswad) fields was 23.4, 34 and 45%, respectively.

B 10

CHARACTERIZATION OF *AGROBACTERIUM VITIS* FROM SYMPTOMLESS CUTTINGS AND POTENTIAL FOR CROWN GALL DISSEMINATION IN ALGERIAN GRAPE NURSERIES.

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Agrobacterium vitis is the causal organism of grape crown gall. This disease causes tumors and overgrowths at the crown and stems of grape. Characterized by its specificity and systemicity to this host plant, the causal organism of this disease survives in the sap and vascular tissues, due to the abundant presence of tartaric acid, a compound allowing the survival of strains belonging to biovar 3. The presence of this bacteria in the propagation material is sufficient to disseminate the disease. In this study, five hundred symptomless cuttings of grape from diverse cultivars collected from different nurseries were analyzed for the presence of this bacterium. After extraction of the sap and isolation on specific and non specific media, 50 strains were identified as biovar 3 *Agrobacterium* strains. Biochemical analysis revealed that among the population of the *Agrobacterium vitis* isolated, 40 % were capable to degrade tartaric acid added to a basal medium and the other strains were not able to degrade this organic acid. In PCR assays, DNA extracted from these strains produced amplification signals corresponding to a 246-bp and a 730 bp fragments located within the virulence region of the Ti plasmid. Molecular analysis using *vir* genes showed that the isolates were virulent and the propagating material is not safe from crown gall infection.

B 11

DETERMINATION OF *ERWINIA* STRAINS ISOLATED FROM POTATO INFECTED WITH BLACK LEG FOR PRODUCTION OF PROTEASE ENZYME.

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The activity of the enzyme Protease in *Erwinia* species isolated from potato infected with black leg disease was monitored. The results showed that the enzyme activity was higher in *Erwinia carotovora atroseptica*, and reached 0.7 unit/mg protein, whereas it reached 0.62 and 0.6 unit/mg protein for the strains *E. carotovora carotovora* and *E. carotovora* subsp. *Betavascularun*, respectively. The highest activity was obtained 48 and 72 hours after incubation for all the strains and the best medium for production of the enzyme was the basic medium with pectin.

B 12

SPECIFIC *HRPL* GENE PRIMERS FOR DETECTING *PSEUDOMONAS SYRINGAE* PV. *TOMATO* BY POLYMERASE CHAIN REACTION.

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The identification and detection of *Pseudomonas syringae* pv. *tomato*, the causal agent of bacterial speck, on tomato leaves and fruits was achieved by polymerase chain reaction amplification of a specific DNA fragment of the *hrpL* sequence. The consensus primers *hrpL1* and *hrpL2* were designed based on the alignment of pseudomonad *hrpL* gene sequences available in nucleic acid data banks. This primer set produced a 631-bp amplicon from 8 of the 15 pseudomonads isolates tested. These isolates belonged to genomospecies 1 and 2. The amplicon obtained from 8 of these isolates was digested with eight restriction enzymes. Three different restriction patterns were produced from isolates belonging to genomospecies 1, resulting in A1 and A2 patterns, while isolates belonging to genomospecies 2 were characterized as B pattern. Patterns A1 and A2 differed at only two sites, a *Bsp* 1431 site located at nucleotide 360 and a *Msel* site located at nucleotides 22- 24. Group A2 consisted solely of *P. syringae* pv. *tomato* isolates. The *hrpL*

gene in *P. syringae* pv. *tomato* isolates was sequenced. Two primer sets, tom1/tom2 and tom1/tom3, were designed and tested for specificity to *P. syringae* pv. *tomato*. These primers amplified expected fragments of 242 and 303 bp, respectively. tom1/tom2 amplified a fragment only with *P. syringae* pv. *tomato* DNA, while tom1/tom3 amplified all tested strains belonging to genomospecies 1. A diagnostic procedure using the Tom1/Tom2 primer set was successful for the detection of *P. syringae* pv. *tomato* in diseased fruit and artificially inoculated leaves. The DIA and ELISA techniques were the least sensitive, requiring populations of 10^6mL^{-1} and 10^5mL^{-1} , respectively, for positive detection of *P. syringae* pv. *tomato*.

B 13

PHYTOPATHOGENIC PSEUDOMONAD IDENTIFICATION BY THE FUZZY LOGIC METHOD. Bouharati Saddek^{1,2}, Harzallah Daoud¹, Benmahammed Kheir² and Saadallah¹. (1) Microbiology Laboratory, Biology department, University of Ferhat Abbas-Sétif, Algeria; (2) Intelligent system Laboratory, Electronic department, University of Ferhat Abbas-Sétif, Algeria, Email: sbouharat@yahoo.fr

Many phytopathogenic Pseudomonad isolates were obtained from plant parts from orchards in Constanine region, Algeria. The isolates were identified and classified according to cultural, biochemical, physiological, and pathogenicity tests. In this study, a new approach for the identification and detection of plant pathogenic bacteria is proposed. This is done by the use of the fuzzy logic method. The treatment of data is done by fuzzy algorithm which ends by a fuzzy program. The response will be in the linguistic and numeric expression to identify plant pathogenic bacteria.

B 14

MOLECULAR CHARACTERISATION OF *PSEUDOMONAS SYRINGAE* PV. *MACULICOLA* AND RELATED PATHOVARS USING PULSED-FIELD GEL ELECTROPHORESIS (PFGE). N. A. Elamri¹, D.L. Arnold², J.D. Taylor³ and A. Vivian². (1) Plant Protection Department, Faculty of Agriculture, El-Fateh University, Tripoli, Libya, Email: na_elamri5@yahoo.com; (2) Center Research in Plant Sciences, University of West of England, Frenchay Campus, Coldharbour Lane, Bristol, BS16 1QY, UK; (3) Horticulture Research International, Wellesbourne, Warwick, CV35 9EF, UK.

Pulsed-field gel electrophoresis (PFGE) represents a highly discriminatory typing technique that can be used to identify genomic differences within the pathovar and between the closely related pathovars. Macrorestriction fragment analysis was conducted after digesting genomic DNA with rare-cutting restriction enzymes *SpeI*, *XbaI* and *SwaI*. The profile patterns analysis of *Pseudomonas syringae* pv. *maculicola* strains and related pathovars revealed five distinct groups of *P. s.* pv. *maculicola* and one group of each *P. s.* pv. *tomato*, *P. s.* pv. *Antirrhini* and *P. s.* pv. *coriandricola*. The unique macrorestriction profiles for some *P. s.* pv. *maculicola*, *P. s.* pv. *tomato* and *P. s.* pv. *lachrymans* strains were obtained.

B 15

THE ROLE OF SPRING IRRIGATION IN DEVELOPMENT OF BLACK CHAFF DISEASE ON WHEAT. Kayali Mayada¹, A. El-Ahmad² and M. Nachit³. (1) General Commission for Scientific Agricultural research, Aleppo Center, Aleppo, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Aleppo University; (3) ICARDA, P.O. Box 5466, Aleppo, Syria.

Bacterial strip (black chaff) caused by *Xanthomonas translucens* pv. *undulosa* is considered as the most important bacterial disease that infects wheat in Syria. The results of this study indicated that both methods of irrigation (sprinkler or flooding) favored the disease development, regardless of the type of inoculation (leaves or seed). However, the rate of infection, the disease severity and the number of infected spikes were significantly higher when sprinkler irrigation was used, compared to flooding irrigation. Similar results were also obtained when leaves were artificially inoculated, compared to the seed inoculation. In addition, the sprinkler irrigation has resulted in decreasing wheat yield and 1000 kernel weight; but increased the rate of seed infection, compared to flood irrigation, in both durum and bread wheat.

B 16

THE CROWN GALL DISEASE (*AGROBACTERIUM TUMEFACIENS*) DISTRIBUTION IN SOME SYRIAN NURSERIES AND IDENTIFICATION OF BIOVARS OF THE PATHOGEN. Mahabba Ghannam¹ and Mahmoud Abo Ghorra². (1) GCSAR, Douma, P.O. Box 113, Damascus, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, Damascus, Syria, Email: emma75@maktoob.com

Crown gall is one of the most important diseases that affect many fruit tree nurseries in Syria. The disease incidence ranged from 2 to 30% in Nabaa Al-Fawwar, Trenja and Sayda nurseries (Al Qunetra governorate) and Tezeen nursery (Hama governorate); however, the disease was not found in Nahj nursery (Daraa governorate) nor in Al-Mokhtarea nursery (Homs governorate). Hundred and eighty bacterial isolates were obtained from infected fruit trees (pear, peach, almond and plum) seedlings or grafted seedlings. The pathogenicity test on tomato seedlings and sunflower plants proved that only 64 isolates were pathogenic, 29.69% of them were pathogenic on both tomato and sunflower, 56.3% were pathogenic on sunflower only and 15.63% infected tomato. The results of biochemical tests showed that 6.25% of bacterial isolates belonged equally to Biovar I and Biovar II, 18.75% were Biovar III, and 68.75% belonged to an intermediate Biovar. This is the first study that determined the Biovars of the pathogen.

B 17

MOLECULAR CHARACTERISATION OF VIRULENCE GENES ON A PATHOGENICITY ISLAND IN *PSEUDOMONAS SAVASTANOI* PV. *PHASEOLICOLA*. Hassan Ammouneh¹ and John Mansfield². (1) Department of Molecular Biology and Biotechnology, AECS, P.O. Box 6091, Damascus, Syria, Email: hammouneh@aec.org.sy; (2) Agriculture science Department, Imperial College London, University of London, Wye, TN25 5AH.

Pseudomonas savastanoi pv. *phaseolicola* (hereafter *Pph*) causes halo blight disease in French bean (*Phaseolus vulgaris* L.). RW60 is a cured strain of *Pph* race 7 strain 1449B which has lost a 154kb plasmid designated pAV511. Loss of the plasmid caused a loss in virulence to previously susceptible bean cultivars. A region of about 30kb of this plasmid has been found to contain a pathogenicity island (PAI). Pathogenicity tests showed that the cloned PAI on pAV520, a pLAFR3- based genomic clone, restored symptom development in pods and leaves of bean. The increase in virulence was reflected by increases in bacterial populations. Transposon mutagenesis with Tn3gus was used to identify genes on pAV520 which have virulence function. The insertion mutagenesis strategy was co-ordinated with acquisition of the DNA sequence of the PAI. The function of genes located by transposon mutagenesis and sequencing was tested after sub-cloning of open reading frames into broad host range shuttle vectors. Several effector genes within the PAI appeared to operate synergistically in promoting virulence. A substantial increase in bacterial numbers was only achieved with *virPphA* in both bean cvs. Tendergreen and Canadian Wonder. Three homologues of *virPphA*, named *virPphA_{P_{GN}}*, *virPphA_{P_{SV}}*, and *avrPtoB* were isolated from *P. s.* pv. *glycinea*, *P. s.* pv. *savastanoi*, and *P. syringae* pv. *tomato*, respectively. The homologues all restored virulence to RW60 as measured by development of water-soaked lesion in bean pods and increased bacterial populations in leaves compared with RW60 alone. RW60 harbouring *virPphA* or *virPphA_{P_{SV}}*, elicited a strong HR in soybean cv. Osumi. The presence of *avrPtoB* caused a weak HR-like response, but *virPphA_{P_{GN}}* did not affect the null reaction observed in soybean with RW60 alone. Only *avrPtoB* increased bacterial multiplication compared with RW60. In *Arabidopsis*, *avrPtoB* was the only homologue which promoted the multiplication and survival of RW60 *in planta*.

B 18

THE ROLE OF SPRING IRRIGATION IN DEVELOPMENT OF ANGULAR LEAF SPOT ON COTTON AND THE EFFICACY OF HEAT STERILIZATION IN REDUCING INFESTATION RATE. Nabeel Al-Ahmad Beig, Mohammed Moffak Yabrak and Mohammed Ameer Hilali. (1) General Commission for Scientific Agricultural research, P.O. Box 113, Douma, Damascus, Syria, Email: gcsarprotass@mail.sy; (2) General Commission for Scientific Agricultural research, Aleppo Center, Aleppo, Syria; (3) General Commission for Scientific Agricultural research, Cotton Researches Administration, Aleppo, Syria.

Angular leaf spot on cotton caused by *Xanthomonas axonopodis* pv. *malvacearum* is considered as the most important bacterial disease that infects cotton in Syria. Disease symptoms were first observed at the end of June. At the beginning of July, depending on temperature, the spring irrigation method encouraged the appearance and development of the disease as compared with flood irrigation, while the Disease didn't develop when drop irrigation method was used. Rate and severity of infestation when spring irrigation was used were significantly higher than when flood irrigation was used. Continuing with spring irrigation until the end of the season reduced yield by 24.9% in comparison with drip irrigation, and 18.8% in comparison with flood irrigation. The results showed that seed heat sterilization delayed disease appearance, especially when spring irrigation was used, which led to increase in yield reached 12-15% compared with the control. Tolerance of tested varieties to the disease following artificial infestation in the field varied. The races 53 and 503 were more tolerant to disease than Variety Raqqa5 in Raqqa site. Differences were not significant at Idleb and Aleppo. It was reported that infection in Al-Hasakah site did not succeed, although it was repeated 20 days after the first inoculation. Because of sudden rise of temperature, which is usual at these times of the year according to annual climatic reports.

B 19

COMPARATIVE STUDY OF ANTIGENIC PROTEINS IN SOME *ERWINIA SPP.* AND PREPARATION OF SPECIFIC ANTISERA. Reem Al-Assil¹, M. Abu Ghorrah², Souad Al Okla³. (1) General Commission of Biotechnology, Damascus, Syria, Email: reemassil@gmail.com; (2) Faculty of Agriculture, University of Damascus, Syria; (3) Faculty of Biology, University of Damascus, Syria.

The early detection of infection in potato tubers caused by *Erwinia* sp. is very important especially when tubers are used for propagation. We produced diagnostic antisera against local *Erwinia* isolates (*Erwinia carotovora carotovora*, *E.c.atroseptica*, and *E.chrysanthemi*) and we identified the antigenic proteins which can differentiate the studied species and sub-species by making indicative profiles of these membrane proteins using electrophoresis as a first step to produce monospecific antisera. On the other hand, we produced polyclonal antisera against the whole antigenic proteins complex of bacterial species and sub-species in order to assess the sensitivity and the specificity of the produced antisera by comparing the two different methods of preparation (against the whole bacteria or against the differential antigenic proteins).

Viral Diseases

V 1

VIRUSES OF POME FRUIT TREES IN SYRIA. Faiz Ismaeil¹, Khaldoun Al-Jabor¹, Arben Myrta², Mouhamed Jamal Mando¹, Ebtisam Al-Saadoun¹ Mouhamed Hassan³ and Salah Al-Chaabi¹. (1) General Commission for Scientific Agricultural Research (GCSAR), Douma, P.O. Box 113, Damascus, Syria, Email: faizismail@mail.sy; (2) Istituto Agronomico Mediterraneo, Via Ceglie 9, 70010 Valenzano (Bari), Italy; (3) Research Institute of Crop Production, Department of Virology, Drnovska 507, 161 06 Prague 6, Czech Republic

A survey was conducted to evaluate the sanitary status of pome fruit trees in Syria during the spring of 2003 and 2004 in 6 governorates: Damascus, Al-Qunaitara and Al-Sweida (Southern region), Homs and Hama (Central region) and Latakia (Coastal Western region), as the main pome fruits production areas. Leaf samples from 1077 apples, 54 pears and 14 quince trees were collected and tested for the presence of *Apple chlorotic leaf spot virus* (ACLSV), *Apple stem grooving virus* (ASGV) and *Apple mosaic virus* (ApMV) in 70 commercial orchards and 3 varietal collections by ELISA. Results showed that virus infection rates were 34 and 2% in apple and pear, respectively. Quince trees were found to be virus-free. Incidence of ACLSV on apple was 34%, whereas ASGV and ApMV were detected in 2 and 0.2% of tested trees, respectively. Pear trees were infected only with ACLSV (2%). 21 apples and 15 pears representative budwood samples were indexed by grafting on the following indicators: (i) *Malus pumila* cvs. Virginia Crab and Radiant for apple and (ii) *M. pumila* cv. V. Crab and *Pyrus communis* cv. Nouveau Poiteau for pear. The virus infection rates obtained by indexing were much higher than that obtained by ELISA; *Apple stem pitting virus* (ASPV) and ASGV were found in 86 and 82% of apple tested samples, and 80 and 60% of pear tested samples, respectively. RT-PCR testing carried out on a limited number of samples confirmed the high incidence of ACLSV ASPV, ASGV and the presence of ApMV. This is the first report on pome fruit viruses in Syria, indicating an unsatisfactory sanitary status of the industry. Thus, the establishment of a certification program for producing healthy pome fruit propagating material is badly needed.

V 2

SURVEY OF APPLE CHLOROTIC LEAF SPOT VIRUS ON STONE AND POME FRUITS IN SYRIA. Kh. Al-Jabor¹, I. Ismail² and S. Al-Chaabi¹. (1) General commission of Scientific Agricultural Research (GCSAR) As-Sweida, Syria, Email: kaljebr@hotmail.com; (2) Faculty of agriculture, Teshreen University, Lattakia, Syria.

This investigation was carried out to survey *Apple chlorotic leaf spot virus* (ACLSV) on stone and pome fruits as a first step to identify the Syrian isolates and to compare it with known virus isolates. 1280 samples of different species of stone fruits (Cherry, Mahaleb, Apricot, Plum, Peach and Almond) and pome fruits (Apple, Pear, Quince and Hawthorn) were tested through April and May 2006. The samples were collected from mother blocks, Genetic blocks and commercial orchards in Damascus countryside, Al-Sweida, Al-Qunaitera, Homs, Hama, Tartous and Latakia governorates. Modified procedure of DAS-ELISA was used, depending on commercial kits by Bioreba (Reinach, Switzerland). The infection rate of all samples studied was 20.4%. Apple samples had the highest infection rate (41.6%), while the lowest infection rate was in peach seedlings (non-grafted species) (2.9%). No infection was detected in apricot, plum, mahaleb, pear seedling and hawthorn samples (304 samples). The detection of virus on pear (14.2%), quince (5.3%), apple seedlings (38.6%) and peach seedlings was recorded for the first time in Syria. Seedlings infection with this virus creates many questions concerning modes of virus transmission other than grafting.

V 3

UTILIZATION OF TISSUE-BLOT IMMUNOASSAY FOR DIAGNOSIS OF APPLE TREE VIRUSES IN IRAQ. Muthana E. El-Muadhidi¹, Zubair N. Selman², and Maad M. Sharif³. (1) State board of plant protection, Abu-Ghraib, Baghdad, Iraq, Email: mothna2003@yahoo.com; (2) General Company for Horticulture and Forests, Abu-Ghraib, Baghdad, Iraq; (3) University of Anbar, College of Agriculture, Anbar, Iraq.

Apple is considered as an important fruit crop in Iraq. A general survey was conducted during 2001 and 2002 to identify virus diseases affecting apple trees at different locations in Iraq. Twenty three randomly selected orchards were surveyed (6 in Baghdad, 5 in Salah El- Din, 5 in Diyala and 7 in El- Anbar governorates). All viruses and their incidences were determined by the tissue blot immunoassay (TBIA) and

included 10-20 symptomatic and 50–150 randomly collected samples from each orchard. A total of 8669 apple samples was collected (during April, May, June and July) and tested for the presence of 5 viruses by tissue blot immunoassay (TBIA). Results revealed that *Apple chlorotic leaf spot virus* (ACLSV) was the most common, followed by *Apple mosaic virus* (ApMV), *Prune dwarf virus* (PDV) and *Prunus necrotic ring spot virus* (PNRSV). The incidence of these viruses were 5.7, 1.9, 0.6 and 0.2%, respectively. Results also indicated that Ana cultivar was the most susceptible to infection, followed by Sharabi and Summery Red (Ahmar Sayfi) with an incidence of 10.8, 6.6 and 3.0%, respectively. Virus incidence varied among locations, especially with ACLSV on Ana cultivar which reached 10.8% in orchards in El-Anbar governorate.

V 4

A SURVEY FOR PRUNE DWARF VIRUS, PRUNUS NECROTIC RING SPOT VIRUS AND APPLE MOSAIC VIRUS IN ROOTSTOCK SEEDLINGS OF STONE FRUITS IN SYRIA. A.R. Darweesh and S. Al-Chaabi, GCSAR, Plant Protection Administration, Douma, P.O. Box 113, Damascus, Syria, Email: gcsarshaabi@mail.sy, adarweesh@mail2world.com

A total of 421 group samples (each sample was made up of 10 seeds or seedlings) were randomly collected from 7 stone fruit nurseries in 6 Syrian governorates. These samples represented three different phenological stages of stone fruit rootstocks; seeds (82 samples), seedlings with four true leaves (67 samples) and 6 months old seedlings after cultivation in nurseries (272 samples). The samples were tested for the presence of *Prune dwarf virus* (PDV), *Prunus necrotic ring spot virus* (PNRSV) and *Apple mosaic virus* (ApMV). This study was conducted during 2003 and 2005 by using double antibody sandwich enzyme linked immunosorbent assay (DAS-ELISA). Results showed that total average of viral infection was 1.84% in tested six month seedlings, compared with 0.63% in seed samples. PDV was the most common, with an incidence of 1.45% in tested seedlings, PNRSV in 0.22%, whereas only three samples were infected with ApMV (0.11%). The highest incidence of viral infection was recorded in peach seedlings (3.22%), followed by mahaleb (2.64%), almond (1.28%) and apricot seedlings (0.64%). No infection was recorded in tested plum seedling samples. The highest incidence (10.58%) was recorded in seedling samples collected from Aleppo governorate, followed by samples from Al-Sweida (2.48%), and the lowest incidence was recorded in seedling samples collected from Homs and Damascus countryside governorates (1.08 and 1.05%, respectively). This is the first report of PDV and PNRSV presence in rootstock seeds of stone fruits in Syria.

V 5

INCIDENCE OF THREE ILARVIRUSES (PNRSV, PDV, APMV) AND TWO VIROIDS (HSVD, PLMVD) ON STONE FRUIT TREES IN EASTERN REGION OF ALGERIA. N. Rouag¹, A. Guechi² and A. Myrta³. (1) Department of Agronomy, UFAS Sétif, route du Scipion, 19000 Sétif, Algeria, Email: rouag_rm@yahoo.fr; (2) Department of Biology UFAS Sétif, route du Scipion, 19000 Sétif, Algeria; (3) Istituto Agronomico Mediterraneo, Via Ceglie 9, 70010 Valenzano Bari, Italy.

The main objective of this research was to quantify the incidence of three *Ilarviruses* PNRSV, PDV and ApMV and two viroids: PLMVd and HSVd in stone fruit orchards and nurseries in the eastern region of Algeria. Samples were collected from seven nurseries, two mother plants and propagating materials and from several commercial orchards, at the end of vegetative season (September- October, 2004) for viroid detection and in early spring (May – June 2005) for ELISA test. Fresh samples were taken from an individual plant, labeled, placed in a plastic bag and stored under controlled temperature and tested later by DAS-ELISA. In total 454 samples were collected and the results showed differences in average viral incidence among plant species as follows: cherry 62.50%, peach 31.19%, plum 26.53%, apricot 25.27%, almond 13.24%, and other species 45.53%. The incidence of PNRSV was the highest (39.06%), followed by ApMV (31.25%) and PDV (29.69%). For viroid detection, 531 samples were analyzed by dot blot nucleic hybridization of tissue prints of cut petiole surface (fresh) on a nylon membrane. The incidence was highest for PLMVd, (14%), followed by HSVd (5.85%). This is the first report of HSVd on stone fruits in Algeria.

V 6

COMPARATIVE STUDY OF THE SEROLOGICAL, MORPHOLOGICAL AND MOLECULAR CHARACTERISTICS OF *CITRUS RINGSPOT VIRUS* AND *CITRUS PSOROSIS VIRUS*. N. Rouag¹, A. Guechi² and E. Luisoni³ and R.G. Milne³. (1) Department of Agronomy, UFAS Sétif, route du Scipion, 19000 Sétif, Algeria, Email: rouag_rm@yahoo.fr; (2) Department of Biology, UFAS Sétif, route du Scipion, 19000 Sétif, Algeria; (3) Institute of Phytovirologie Applied CNR, 1-10135 Torino, Italy.

The *Citrus psorosis* and *Citrus ringspot viruses* were compared through serological and morphological studies of 14 psorosis and 4 ringspot isolates. Using the antiserum produced against the type isolate of citrus ringspot virus (*CitRSV-4*), 11 psorosis and 3 ringspot isolates were DAS-ELISA positive; symptomless tissues from infected *Citrus* were sometimes highly positive. One ringspot isolate (*Italia 1*) gave local lesions, but no virus particles were detected and ELISA tests were negative. The other 8 psorosis isolates were not mechanically transmissible, but 5 of these were positive in ELISA. A new protocol was developed for purification of *CitRSV-4*, starting from *C. quinoa* local lesions. Host materials were almost completely eliminated, whereas previous protocols gave only partial purification. Two visible bands were obtained after the final density gradient centrifugation, corresponding to flexuous filamentous virus particles of different sizes. The particles were also present in two forms, one open circular composed of a filament 3 nm in diameter, and a linear form about 9 nm in diameter consisting of two 3 nm strands looped over at the ends. Fresh preparations made from crude extracts of 5 psorosis and 3 ringspot isolates contained only the open circular form. Western blotting analysis of total proteins extracts from local lesion on *C. quinoa*, of 4 psorosis and 2 ringspot isolates, each gave a band (the presumed coat protein) of an estimated size of 52 kd. Purified preparations of *CitRSV-4* gave a band of 48 kd. In conclusion, most psorosis and ringspot isolates tested appear similar to *CitRSV-4*.

V 7

USE OF TISSUE CULTURE TECHNIQUES WITH OR WITHOUT THERMOTHERAPY TO ELIMINATE *CANDIDATUS PHYTOPLASMA PHOENICIUM* FROM TWO INFECTED LEBANESE ALMOND VARIETIES. Lamis Chalak¹, Elia Choueiri¹, Ahmad Elbitar¹, Reine Rizk¹, Pascal Salar² and Joseph M Bové². (1) Lebanese Agricultural Research Institute, Zahle P.O. Box 287, Lebanon; (2) UMR GDPP, Institut National de la Recherche Agronomique, BP 81, 33 883 Villenave d'Ornon cedex, France, E-mail: lchalak@lari.gov.lb.

A lethal disease of almond trees characterized by the development of conspicuous witches' brooms and associated to *Candidatus Phytoplasma phoenicium* was recently reported in Lebanon leading to tree death within a few years after appearance of the first symptoms. The present study aimed to eliminate this phytoplasma from two infected Lebanese varieties of almond "Halwani and "Khachabi" by using different tissue culture techniques. The results showed that stem cutting cultures and thermotherapy, shoot tip cultures with or without thermotherapy, and shoot tip micrografting were all suitable, either for shoot regeneration or for elimination of phytoplasma from the two varieties. However, stem cutting culture coupled with thermotherapy seemed to be the most effective for regeneration of phytoplasma-free plantlets.

V 8

MOLECULAR CLONING AND EXPRESSION OF THE COAT PROTEIN GENE OF *PLUM POX VIRUS EL-AMAR STRAIN* IN *E. COLI*. Kh.A. Dougdoug¹, M.A. Abou El-Nasr¹, Hayam S. Abdelkader² and Rehab A. Dawoud². (1) Microbiology Department, Faculty of Agriculture, Ain Shams University, Shoubra El-Khema, Cairo, Egypt; (2) Virus and Phytoplasma Research Department, Plant Pathology Research Institute, Agricultural Research Center, Giza, Egypt, Email: drdougdoug@yahoo.com

Plum pox potyvirus (PPV), the causal agent of Sharka disease of *Prunus* sp., inflicts severe crop losses in affected El-Amar area. The virus was isolated from El-Amar apricot trees, and propagated in apricot healthy seedlings. Degenerated oligonucleotide primers were designed to amplify the N-terminal portion of the PPV capsid protein. The amplified products were cloned into pGEM-T.Easy vector and hybridized to PPV DNA specific probe labeled with Dig. 11dUTP. DNA sequencing using fluorescent dideoxy nucleotides showed that the capsid protein region of PPV-EA strain has about 65% sequence homology with other strains of PPV and 45% similarity to the CP of PPV-D strain. A PCR fragment coding for the 43 C-terminal amino acids of the Nib and the N-terminal part of the CP (complete variable region

plus 19 amino acids of the conserved core) was cloned and expressed into the pQE-100 plasmid vector. Upon induction, the viral coat protein gene was expressed as 6xHis-tagged PPV-CP fusion protein in *E. coli* M15 cells. The fusion protein was confirmed by western blot analysis.

V 9

PRELIMINARY SURVEY OF OLIVE VIRUSES IN SYRIA. Abdul Kader AlAbdullah¹, Toufic El Beaino¹, Maria Saponari², Hussain Hallak³, Michele Digiario¹ and Giovanni Paolo Martelli². (1) Istituto Agronomico Mediterraneo, Via Ceglie 9, 70010 Valenzano, Bari, Italy; (2) Dipartimento di Protezione delle Piante e Microbiologia Applicata, Università degli Studi di Bari and Istituto di Virologia Vegetale del CNR, Bari, Italy; (3) Department of Olive Research, GCSAR, Idlib, Syria, Email: abdukkader76@hotmail.com

Olive is one of the most ancient agricultural species in Syria, where it is grown on an area of about 500,000 ha. Considering the scarce knowledge on the sanitary status of olive crop in Syria, field surveys were carried out to assess the incidence of virus diseases in the Syrian groves. To this aim eighty commercial groves were visited in autumn 2003 in six major Syrian olive growing regions (Aleppo, Idlib, Latakia, Tartous, Dara'a and Hama). A total of 300 olive samples were collected, which were representative of the most important local cultivars (Zaiti, Sorani, Da'aebli, Khderi, Qaysi and Mosa'abi). As ascertained by dsRNA analysis, 54 out of 125 samples (ca. 43%) showed visible bands of dsRNA in polyacrylamide gel electrophoresis. All samples were tested by RT-PCR using specific primers for the following viruses: *Arabis mosaic virus* (ArMV), *Cherry leaf roll Virus* (CLRV), *Cucumber mosaic virus* (CMV), *Olive latent ringspot virus* (OLRSV), *Olive latent virus 1* (OLV-1), *Olive latent virus 2* (OLV-2), *Olive leaf yellowing-associated virus* (OLYaV) and *Strawberry latent ringspot virus* (SLRSV). All these viruses, singly or in mixed infection, were detected in about 51% of the samples. CMV was the most prevalent (22.7%), followed by CLRV (15%), OLYaV (14.3%) and OLRSV (11.5%). Less represented were the remaining four viruses. Infection of the two main local cultivars, 'Zaiti' and 'Sorani', was about 47%, whereas it reached to 67% in the variety Khderi. Infection rates ranged from 44% in Dara'a region to 67% in Latakia and Hama.

V 10

ELIMINATION OF GRAPEVINE LEAFROLL-ASSOCIATED VIRUS 1 AND GRAPEVINE FANLEAF VIRUS FROM INFECTED GRAPEVINES BY MERISTEM TIP CULTURE. Sahar A. Youssef¹, M.M. Al-Dhaheer² and A.A. Shalaby¹. (1) Virus and Phytoplasma Research Department, Plant Pathology Research Institute, ARC, Giza, Egypt, Email: aashalaby@link.net; (2) Horticulture Department, ARC, Damascus, Syria.

Grapevine (*Vitis vinifera* cv. Thompson seedless) was found infected with viral diseases showing thicker leaves than normal, brittle, with margins rolled downwards and chlorotic, and the causal virus was identified as Grapevine Leafroll-associated Virus 1 (GLRaV-1). Another type of symptoms of malformed leaves with abnormally combined primary veins, giving the leaf the appearance of an open fan were observed. Other symptoms observed included a yellow mosaic pattern on the leaves or bright yellow bands along major veins. Fan-shaped leaves with or without mosaic or vein banding symptoms was identified to be associated with *Grapevine fanleaf virus* (GFLV). Both viruses were detected using double antibody sandwich ELISA (DAS-ELISA) and reverse transcriptase-polymerase chain reaction (RT-PCR). The use of tissue culture was investigated as a mean to eliminate the two viruses from infected tissue. Virus-free plants were produced within six months using meristem tip culture on Woody plant (WP) medium supplied with benzyl aminopurine (1mg/l) and indole butyric acid (IBA) (0.05mg/l) was used for shoot proliferation, and IBA (0.05mg/l) for plant rooting. Detection of the viruses in grapevine plantlets was carried out by RT-PCR using specific primers. No virus could be detected in plants transferred to the glasshouse after they were checked at the final subculture over a period of six months, thus confirming the elimination of GLRaV-1 and GFLV.

V 11

PRELIMINARY EVALUATION OF THE SANITARY STATUS OF GRAPEVINE IN SYRIA. Th. Mslmanieh¹, M. Digiario², T. Elbeaino² and G.P. Martelli³. (1) Douma P.O. Box 113, General Commission of scientific Agricultural Research, Damascus, Syria, Email: thuraya@scs-net.org; (2) Istituto Agronomico Mediterraneo, Via Ceglie 9, 70010, Valenzano (Bari), Italy; (3) Dipartimento di Protezione delle Piante e Microbiologia Applicata, Università degli Studi and Istituto di Virologia vegetale del CNR, sezione di Bari, Via G.C. Amendola 165/A, 70126 Bari, Italy.

Symptoms of leaf roll, rugose wood, graft-incompatibility, and more rarely, fanleaf were observed during a survey in the grapevine -growing areas in Syria. GFLV, ArMV, GVA were detected by mechanical inoculation onto herbaceous plants, and vein necrosis and vein mosaic symptoms were produced on graft-inoculated indicators. 520 out of 736(70.7%) *v. rinefera* plants were found infected by ELISA. In commercial vineyards, GVA was the most common virus (54.7%), followed by GLRaV-1, GFKV and GLRaV-3. The other viruses tested were rarely present (GLRaV-2, GFLV, ArMV and GVB). The vineyards at Suwayda, in the south of Syria were heavily infected (77.8%), with cv. Hellwany most affected (90.6%). The rootstocks in the nurseries, were less infected (25%), and almost exclusively by GFKV (22.0%). Molecular assay was applied to investigate for the presence of GRSPaV in 135 vines by using specific primers, GRSPaV was the most common (72.3%) and its presence was highly associated with vein necrosis in 110 vines. Degenerate primers for *Closteroviridae* were used to detect other *Ampelovirus* species not tested by ELISA in 72 vines, and were ELISA negative for GLRaV-1, GLRaV-2 GLRaV-3. The results obtained suggested the existence of other *Closteroviridae* species infecting Syrian grapevines. Similarly, the use of degenerate primers for *Nepovirus* detection in RT-PCR showed the presence of other *Nepovirus* species different from GFLV and ArMV.

V 12

CHARACTERISATION OF PHYTOPLASMAS ASSOCIATED WITH FLAVESCENCE DORÉE AND "BOIS NOIR" IN GRAPEVINES FROM NORTHWESTERN ITALIAN REGIONS. Davide Pacifico¹, Alberto Alma² and Cristina Marzachi¹. (1) Istituto di Virologia Vegetale, CNR, Strada delle Cacce, 73, 10135 Torino, Italy, Email: c.marzachi@ivv.cnr.it; (2) Di.Va.P.R.A./Entomologia, Università degli Studi di Torino, Via L. da Vinci, 44, 10095 Grugliasco (TO), Italy.

Grapevine yellows is a serious limiting factor in European and Italian traditional grapevine growing regions. Flavescence dorée (FD) and Bois Noir (BN) are caused by phytoplasmas (FDP and BNP) of different taxonomic groups. Severe FD epidemics occurred in the recent years in Northern Italy due to the high population density of the strictly ampelophagous vector *Scaphoideus titanus*. BN is endemic in grapevine growing areas in Europe and the Mediterranean basin and it is not as epidemic as its polyphagous vector *Hyalesthes obsoletus* which feeds only occasionally on grapevine. Genetic variability of Italian FDP and BNP was assayed by PCR-RFLP and SSCP analysis. FD and BN infected grapevines were collected from Northwestern Italian Regions in 2004 and 2005, BN positive *H. obsoletus* individuals and wild weeds were also tested. PCR-RFLP analysis of the 16S ribosomal RNA (16SrRNA), *secY* and ribosomal protein *rp* genes evidenced patterns corresponding to FDP standard types C and D. Type C was the most prevalent. A third FDP type different from the standard isolates was also present in 2004 and 2005. PCR-RFLP analysis of *tuf* gene from BN infected grapevines and insects showed two patterns corresponding to the BNP standard types VK-I and VK-II. Only VK-II type was present in infected weeds. SSCP analysis of BN isolates showed four reproducible and constant profiles and more sequence information than RFLP. Distance among the most representative FDP and BNP grapevine isolates was also assessed on sequences of their 16SrRNA gene.

V 13

MOLECULAR CHARACTERIZATION OF A GRAPEVINE LEAFROLL-ASSOCIATED VIRUS-4 (GLRAV-4) VARIANT. F. Talas¹, P. Saldarelli² and G.P. Martelli². (1) General Commission of Biotechnology, P.O. Box 31902, Damascus, Syria, Email: firastalas@hotmail.com; (2) University of Bari, Italy.

The known variants of GLRaV-4 are: Y252, Y253, DD85, and LR106. It was suggested that the variant Y253 is a new virus named GLRaV-10, based on the serological variation between Y253 and LR106

with additional differences in the viral genome sequence. We attempted to sequence the Coat Protein (CP) of Y253. A couple of Primers at 3' end and at the middle of viral coat protein gene were designed based on the strain LR106. When Y253, Y252 and LR106 were compared there was complete sequence homology. To obtain the rest of CP, another couple of degenerate primers in the middle of CP and at the end of the closest gene P55 were used. There were differences close to the 5' end of CP. The use of Peptidestructure UW-GCG package software suggested that the potentiality of the first 20 AAs to generate antigens was clearly higher in LR106 than in Y253, justifying the serological differences between the two variants. Results of this study did not support the suggestion of a new *Ampelovirus* depending only on few variations in HSP70 and CP sequences.

V 14

CHARACTERIZATION OF TOMATO SPOTTED WILT VIRUS ISOLATES INFECTING PEANUT IN SOUTHWESTERN STATES OF USA. Mohammed A. Al-Saleh¹ and Kelly D. Chenault².

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Tomato spotted wilt virus (TSWV) is a serious virus affecting peanut (*Arachis hypogaea* L.) in all peanut-producing states in U.S. Due to the lack of molecular information on TSWV-isolates associated with peanut in southwestern states, the aim of this study was directed at exploring the diversity of TSWV-isolates in these states. Symptomatic peanut samples were collected from peanut fields and the viral RNA was extracted. Complementary DNA (cDNA) was generated by reverse transcriptase PCR (RT-PCR), nonstructural NSm and nucleocapsid N genes were amplified by PCR then cloned, and sequenced in order to determine their phylogenetic relations. The Clustal W program was used for sequence comparison among TSWV-isolates reported elsewhere. Twelve NSm and Five N gene proteins of TSWV infecting peanut in southwest growing areas were sequenced. Several conserved motifs were observed in the amino acid sequences of NSm proteins. Based on nucleotide and amino acid sequences of NSm and N gene proteins, phylogenetic analyses revealed that TSWV-isolates from southwest U.S. formed close clusters that were distinct from other TSWV-isolates reported previously.

V 15

IDENTIFICATION AND INCIDENCE OF SOME VIRUSES CAUSING TOMATO FRUITS NECROSIS IN IRAQ. Rana J. Shaker¹, Muthana E. El-Muadhidi² and Rakib A. Al-Ani³. (1) College of Agriculture, University of Tikreet, Salah EL-Deen, Iraq; (2) State Board of Plant Protection, Abu-Ghraib, Baghdad, Iraq, Email: mothna2003@yahoo.com; (3) College of Agriculture, University of Baghdad, Abu Ghraib, Baghdad, Iraq.

Tomato fruit necrosis is considered as one of the main disease problems in Iraq, leading in many cases to serious yield losses because of unsuitability of tomato fruits for consumption. This disease syndrome became wide-spread in protected cultivation in 1998-1999. This study was conducted during 2000-2001 growing seasons to identify the causes of this problem. The causal agents of this disease were identified by means of symptoms, reaction on indicator plants, host range and serological tests. Results revealed the presence of two distinct types of fruit necrosis caused by three viruses. The first type was caused by a strain of *Alfalfa mosaic virus* (AMV), and the second was due to an interaction between *Tobacco mosaic virus* (TMV) and *Potato virus X* (PVX), known as double streak disease. Survey of tomato necrosis syndrome showed that the incidence of infection in protected cultivation was slightly more than that in the open field, and ranged between 6.4 to 10.83% and 5.55 to 5.8%, respectively.

V 16

SERVEY OF TOMATO YELLOW LEAF CURL VIRUS IN WESTERN LIBYA. Mohammad Zaijed, Jabr Khalil and Mohammad Shagrun, Plant Protection Department, Faculty of Agriculture, University of El-Fateh, Libya, Email: mohrem2002@yahoo.co.uk

The objective of this study was to identify the causal agent of tomato yellow leaf curl disease in the western region of Libya. Sixty greenhouses distributed in 21 locations were surveyed during 2001/2002, 2002/2003 and 2003/2004 growing seasons. During this survey, 60 leaf samples of tomato plants showing

yellowing and leaf curl symptoms were collected and dried using anhydrous calcium chloride. The indirect ELISA test proved that all collected samples reacted positively with the antiserum of *Tomato yellow leaf curl virus* (TYLCV). Immunoelectron microscopy proved the presence of TYLCV in fresh leaf samples collected from diseased tomato plant. The virus was successfully purified and was confirmed by ELISA test. Morphological studies by using the electron microscope showed that the particles were spherical and geminate. The diameter of the single particle was 21 nm and the length of geminate particles was 28 nm.

V 17

FIELD STUDIES AND MOLECULAR IDENTIFICATION OF TOMATO LEAF CURL VIRUS IN SUDAN. Sana K. Mukhtar¹, Ahmed Hashim², Michel Peterschmitt³. (1) Plant Protection Department, University of Kordofan, Sudan; (2) Plant Protection Department, University of Khartoum, Sudan; (3) Virology Laboratory. CIRAD, Montpellier, France.

Tomato (*Lycopersicon esculentum*. Mill) is one of the most popularly grown vegetable crops in the world. *Tomato leaf curl virus* (TLCV, genus *Begomovirus*, family *Geminiviridae*) is one of the most destructive diseases of tomato crop. It is transmitted by the whitefly *Bemisia tabaci*. Two field trials were conducted during 2002/2003 and 2003/2004 winter seasons at Bara area western Sudan to identify tomato varieties resistant to TLCV. In both seasons the variety response to disease incidence and severity was highly significant ($P < 0.001$). The cultivar Strain B gave the highest disease incidence and severity followed by the variety Peto 86. The varieties Abdalla and Allakareem showed less disease incidence and severity. The varieties CLN21126B and Omdorman gave the lowest incidence and severity of the disease. In 2002/03 season the variety Peto86 gave the highest yield of marketable fruits (8.5 T/ha) followed by variety Omdorman (7.7 T/ha) and variety Abdalla (7.3 T/ha). In 2003/04 season the variety Abdalla gave the highest yield of marketable fruits (7.7 T/ha) followed by Omdorman (7.5 T/ha) and Peto 86 (7.2 T/ha). The variety Strain B gave the lowest yield of marketable fruits (2.9 and 3.3T/ha) in 2002/2003 and 2003/2004, respectively followed by CLN21126B (4.6 T/ha). Laboratory studies were conducted in the Virology Laboratory at the Centre de cooperation internationale en recherche agronomique pour le developpement (CIRAD), Montpellier, France, where tomato samples collected from five different localities in the Sudan were tested. The sequence of the capsid protein gene confirmed that all tomato isolates from the Sudan belongs the *Tomato leaf curl virus* and not the *Tomato yellow leaf curl virus*.

V 18

LEAF CURL DISEASE OF TOMATO FROM YEMEN IS ASSOCIATED WITH A BEGOMOVIRUS CLOSELY RELATED TO TOMATO LEAF CURL SUDAN VIRUS-GEZIRA, AND PREVIOUSLY UNDETECTED BEGOMOVIRUSES FROM COWPEA AND PEPPER IN YEMEN. Abdullah Nasher¹, Ali M. Idris² and Judith K. Brown². (1) Department of Plant Protection, Sana'a University, Sana'a, P.O. Box 13609 (Mean Post Office), Yemen, Email: abd_nasher@yahoo.co.in; (2) Department of Plant Sciences, The University of Arizona, Tucson, AZ 85721, USA, Email: jbrown@ag.arizona.edu

Leaf curl symptoms like those often associated with begomovirus (family: *Geminiviridae*) infection were observed in vegetable plantings in Tihamah, Taiz, and, Jadir area (Sana'a) in Yemen. Virus-like symptoms were widespread in the three production areas in tomato plantings where disease incidence was 40% by 40 days post-seeding. Two months after sowing the incidence in tomato had reached 100%. Begomovirus-like symptoms also were observed in cowpea (Tihamah and Sana'a Fac Ag Res Farm) and in pepper (Tihamah) plantings. Leaf samples were collected from symptomatic cowpea, pepper, and tomato plants from the four locations. Total DNA was extracted from the samples using Extract 'N' Amp (Sigma, St. Louis MO USA). Extracts were subjected to amplification by polymerase chain reaction (PCR) using core Cp primers that amplify most if not all begomoviruses. The expected size product (~576 bp) was obtained from four of six samples. Amplicons were cloned and the sequence was determined. Comparison of the core Cp sequences with well-studied begomoviruses for which sequences are available in GenBank indicated that all tomato isolates shared 97% nucleotide (nt) identity with a tobacco isolate from Yemen [AF070926] for which a DNA sequence had previously been obtained and *Tomato leaf curl Sudan virus-Gezira* [AY044137], with the next closest relative being ToLCSV-Shambat [AY044139] at 96% nt identity. The samples were further subjected to amplification using the rolling circle amplification (RCA) method,

with enhanced detection capability. The RCA products were digested with *Sst* I, *EcoR* I, or *Nco* I, yielding begomoviral genome-length fragments of ~2.7 kbp. Fragments were cloned into pGEM7Zf+ and colonies bearing full-length size inserts were selected and subjected to DNA sequencing. Results will be discussed in relation to their closest relatives among well-studied begomoviruses.

V 19

STUDIES ON TOMATO VIRAL DISEASES IN SOUTHERN SYRIA. AND SCREENING CULTIVARS FOR RESISTANCE TO INFECTION WITH VIRUSES. Houda Kawas, Plant Protection Department, University of Damascus, Damascus, Syria, Email: houdakawas@yahoo.com

The viruses reported to infect tomato *Lycopersicon esculentum* L. (Solanaceae) are over 30 belonging to 16 different taxonomic groups worldwide. During 1998-2003 growing seasons in southern Syria, the most important and more frequent and severe viruses in open fields and plastic houses were investigated through mechanical, insect transmission, host ranges, indicator plants, and seed transmission. 1200 samples which showed typical virus symptoms with severe yield losses on tomato were tested serologically by Enzyme - Linked Immunosorbent Assay (ELISA) using 11 different antisera. Reaction of 26 cultivars to different local tomato virus isolates such *Alfalfa mosaic alfamovirus* (AMV), *Cucumber mosaic virus* (CMV), *Potato virus Y* (PVY), *Tobacco mosaic virus* (ToMV), *Tomato yellow leaf curl virus* (TYLCV) and *Tomato spotted wilt virus* (TSWV) were evaluated under growth chamber conditions with artificial inoculation by insects *Bemisia tabaci* Gennadius (Homoptera: Aleyrodidae), *Myzus persicae* Sulzer (Homoptera: Aphididae) and *Thrips tabaci* (Thysanoptera: Thripidae). Evaluation of tomato cultivars for resistance under field conditions during 1998-2002 growing seasons, based on yield, fruit set, size and color, and reaction to viral diseases was carried out. Survey in the major tomato-growing region of southern Syria estimated tomato yield loss by 25-62%. Virus incidence based on filed symptoms was between 12 and 85%. Average seedling viral infection was 17%. Cultivars belonging to *Lycopersicon peruvianum*, *L. hirsutum*, *L. pimpinellifolium* and local expressed different types of resistance towered local isolates of different viruses. Some cultivars were found promising under field conditions in Syria. *Bemisia tabaci* was noticed to be the major insect problem in several plastic houses, and Thrips were the major problem in the open field. Further studies are needed to investigate possible existence of other viruses.

V 20

DIAGNOSIS, PURIFICATION AND PREPARATION OF AN ANTISERUM FOR BEET YELLOWS VIRUS ISOLATED FROM SUGAR BEET FIELDS IN NENAVA PROVINCE, IRAQ. N.A. Kassim and A.W. Al-Chero, Plant Protection Department, College of Agriculture and Forestry, Mosul University, Iraq, Email: dr_nabel2@yahoo.com

A survey conducted in sugar beet fields in Nenava province during 2001-2002, indicated that the incidence of *Beet yellows virus* (BYV) reached 40.6% and 14.3% in summer and autumn seasons, respectively. The virus was identified based on its reaction with sugar beet, chard and other plants as indicator plants mechanically inoculated with isolates collected from the field, in addition to successful by the aphid vector *Myzus persicae*. The virus remained infective in dried beet leaves and frozen leaves for one year, and up to 3-6 months in frozen extract. The study showed that many weed species grown in sugar beet fields were naturally infected with BYV and played an important role in its survival. The virus was purified by using gel filtration through seradest column. The UV absorption ration 260:280 was 1.67. BYV antiserum was prepared in a white rabbit injected with purified virus preparation mixed with alum. The antiserum prepared was used successfully in agar double diffusion and agglutination tests.

V 21

WEEDS AS ALTERNATIVE HOSTS FOR BSBV, BNYVV AND THE VECTOR POLYMYXA BETAE. Ahmad M. Mouhanna¹, Grgeor Langen² and Eckart Schlösser²(1) Agriculture Faculty, University of Aleppo, Syria; (2) Institute for Phytopathology and Applied Zoology, Justus-Liebig-University, Heinrich-Buff-Ring 26-32, 35392 Giessen, Germany, Email: AhmadMouhanna@gmx.net

When grown in contaminated soil, several weed species proved to be alternative hosts for the *Beet necrotic yellow vein virus* (BNYVV), the *Beet soil-borne virus* (BSBV), and their common vector *Polymyxa betae*. These species include monocots: *Alopecurus myosuroides*, *Lolium multiflorum*, *Sorghum vulgare*,

Sorghum halepense; and dicots: *Calystegia sepium*, *Capsella bursa-pastoris*, *Centaurea cyanus*, *Convolvulus arvensis*, *Galinsorga parviflora*, *Matricaria inodora*, *Stellaria media*. *Chenopodium album* was a host for *P. betae*, but not for the two viruses. The status of the weeds as alternative hosts was confirmed by positive re-transmission of the viruses by their vector from infected weed roots to susceptible sugar beet plants. Sequence analysis of a cDNA probe and northern blot analysis proved *P. betae* but not *P. graminis* to be the vector for the virus transmission from weeds.

V 22

MOLECULAR CHARACTERIZATION OF BEET MOSAIC VIRUS (BTMV). Hanaa Hasan¹ and Edgar Maiss². (1) General Commission of Scientific Agricultural Research, Douma P.O. Box 113, Damascus, Syria, Email: hanaa70@maktoob.com; (2) Institute of Plant Diseases and Plant protection, Hannover University, Herrenhauser Strasse 2, Germany, Email: maiss@ipp.uni-hannover.de

Beet mosaic virus (BtMV) is a member within the genus *Potyvirus* from the large and economically important family *Potyviridae*. To characterize the virus at the molecular level, total RNA was extracted from BtMV (DSMZ; PV-0065) infected *Nicotiana benthamiana* plants and used as a template for cDNA synthesis. BtMV-specific oligonucleotides were designed and used together with a 26mer oligonucleotide, containing a random hexamer sequence at its 3'-end, for synthesis and amplification of cDNA fragments by RT-PCR. The 5'-terminus of the genome was determined by reverse transcription of viral RNA using a specific primer, tailing of the cDNA with dGTP by terminal transferase followed by amplification with a nested primer and an oligo-C15 primer. The fragments were cloned into the pGEM-T- Easy vector and the complete nucleotide sequence of BtMV genomic RNA was determined. The BtMV genome comprises of 9592 nucleotides (nts) and contains one large open reading frame (ORF) encoding a poly protein of 3085 amino acid residues. The 5' and 3' non translated regions (NTR) were determined with 166 and 171 nts, respectively. Nine putative proteolytic cleavage sites were identified resulting in ten mature proteins: P1, HC-Pro, P3, 6K1, CI, 6K2, NIa, VPg, NIB, and CP, which are typical for all members of the genus *Potyvirus*. Alignment of the predicted polyprotein sequence with a sequence of a BtMV isolate from USA as well as with other potyviruses revealed amino acid sequence motifs typical of potyviruses. However, some motifs located in the HC-Pro, CI and NIB of BtMV contained different amino acids in comparison with other potyviruses. Phylogenetic analysis clearly showed BtMV as a distinct member of the genus potyvirus, sharing the highest amino acid sequence identity (55%) with *Peanut mottle virus* (PeMoV). A full-length clone of BtMV was assembled in a plasmid harbouring an enhanced *Cauliflower mosaic virus* (CaMV) 35S promoter. For this purpose four cDNA clones, each generated by RT-PCR were used. The BtMV full-length clone leads to infectious virus in *Nicotiana benthamiana* after particle bombardment. Subsequent mechanical inoculation of *N. benthamiana* with the BtMV generated from the full-length clone shows a slower symptom development than with wild-type virus. The infectious cDNA clone of BtMV provides a tool to study virus replication and could contribute towards a better understanding of the molecular biology of the genus *Potyvirus*.

V 23

DETECTION OF BEET SOIL BORNE VIRUS AND TYPE A OF BEET NECROTIC YELLOW VEIN VIRUS IN RAZAVI KHORASAN PROVINCE OF IRAN USING THE RT-PCR METHOD WITH SPECIFIC PRIMERS. Sara Gharooni Kardani, Fatemeh Tabasinezhad, Behrooz Jafarpour, Mahrokh Falahati Rastegar, Department of Plant Pathology, Faculty of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163, Iran, Email: fatemeh_tabasinezhad@yahoo.com, saragharooni@yahoo.com

Beet soil borne virus (BSBV) and *Beet necrotic yellow vein virus* (BNYVV) are members of the genera *Pomovirus* and *Benyvirus*, with rod shaped particles and positive single stranded RNA. They are an important sugar beet viruses transmitted by the soil borne fungus, *Polymyxa betae* Keskin that survives in soil for many years. BSBV is morphologically similar to BNYVV but serologically different. BNYVV has A, B, and P types. In order to detect this viruses in Razavi Khorasan province, in fall and summer of 2005, samples with distinctive symptoms of infection were collected from different fields in the region. Infection was confirmed by TAS-ELISA and DAS-ELISA. Total RNA was extracted from roots of infected samples by using PEG precipitation method and cDNA was made using random hexamer primers. PCR was

performed with specific primers for these viruses. After electrophoresis on 1.5% agarose, specific bands of 399 bp for BSBV and 324 bp for BNYVV were detected.

V 24

DISTRIBUTION OF BEET WESTERN YELLOWS VIRUS IN SYRIA. Nader Asaad¹, Safaa G. Kumari², Amin Haj Kasem³, Rajendra Malhotra² and Salah El-Chaabi⁴. (1) General Commission of Scientific Agricultural Research (GCSAR), Al-Ghab Station, Syria, Email: virology@icarda.exch.cgiar.org; (2) Virology Laboratory, ICARDA, P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org; (3) Faculty of Agriculture, Aleppo University, Aleppo, Syria; (4) GCSAR, Douma, P.O. Box 113, Damascus, Syria.

A field survey was conducted during the 2005/2006 growing season to investigate the distribution of *Beet western yellows virus* (BWYV, genus *Poterovirus*, family *Luteoviridae*) and its natural host range in four main regions (northern, middle, coastal and southern) of Syria. Some 1797 plant samples (801 faba bean, 570 chickpea, 102 lentil, 157 pea, 103 sugar beet and 64 *Vicia*) with symptoms suggestive of viral infection were collected from 150 fields (51 faba bean, 39 chickpea, 8 lentil, 18 pea, 20 sugar beet and 14 *Vicia*). In addition, 238 plant samples including weeds grown in the above-mentioned fields, belonging to seven families (Fabaceae, Chenopodiaceae, Polygonaceae, Papaveraceae, Brassicaceae, Apiaceae and Asteraceae), were collected. Results of the TBIA test showed that the chickpea, *Vicia*, pea, faba bean, lentil, and sugar beet crops were infected with BWYV at the rate of 9.12, 4.69, 3.92, 1.5, 0.98, and 0.97%, respectively. Symptoms observed varied from yellowing, stunting, to reddening, except on faba bean, where symptoms were not very clear. In addition, other viruses such as the *Bean leaf roll virus* (BLRV), *Soybean dwarf virus* (SbDV), *Faba bean necrotic yellows virus* (FBNYV), which produce symptoms similar to those produced by BWYV, and others unidentified members of the family *Luteoviridae* were detected. BWYV was identified in 12 plant species from different families found within or around legume or sugar beet fields. The species are *Spinacia oleracea* L. (Chenopodiaceae), *Emex spinosa* L. (Polygonaceae), *Sonchus* spp., *Chrysanthemum* spp., *Anthemis* spp. (Asteraceae), *Papver rhoeas* L. (Papaveraceae), *Rhaphanus raphanestrum*, *Sinapis arvensis*, *Brassica* spp. (Brassicaceae), *Melilotus indicus* (L.) All, *Medicago* spp. (Fabaceae), and *Coriandrum* spp. (Apiaceae). This is the first report of the natural infection of these species with BWYV in Syria. The identity of the virus was confirmed by PCR using specific primers, which can amplify the viral coat protein gene. Variability among Luteovirus isolates from different plant species was also investigated. The identity of aphid species that occur in Syria and transmit these isolates will be presented.

V 25

FIRST REPORT ON VIRUSES WHICH INFECT POTATO IN SYRIA. A.A. Haj Kassem¹, Khalil Abdul Halim², Om Eltuka Ghufraan Rifai³ and Mohamed Kassem¹. (1) Faculty of Agriculture, Aleppo University, P.O. Box 7548, Aleppo, Syria, Email: aahkasem@scs-net.org; (2) General Commission for Scientific Agricultural Research, Duma, Syria; (3) Seed health Laboratory, Agriculture Directorate of Aleppo, Syria.

A field survey was conducted during 2002/2003 and 2003/2004 growing seasons to determine the incidence of virus diseases affecting potato crops in Syria. A total of 1325 plant samples with symptoms suggestive of virus infection were collected from 84 fields in Aleppo, Edleb, Hama, Homs, Latakia and Tartous provinces. Serological tests indicated the presence of nine viruses affecting potato; *Potato virus Y* (PVY) was the most commonly encountered virus in potato fields, followed by *Potato virus X* (PVX), *Potato virus S* (PVS), *Potato leaf roll virus* (PLRV), *Cucumber mosaic virus* (CMV), *Alfalfa mosaic virus* (AIMV), *Potato virus M* (PVM), *Potato aucuba mosaic virus* (PAMV), and *Potato yellow dwarf virus* (PYDV). Virus incidence in tested samples infected with only one virus, two viruses and three or more viruses were 12.4%, 23.8% and 39.2%, respectively. Virus incidence was higher in the second season in comparison with the first season. This is the first record of natural infection of potato plants with CMV, AIMV, PAMV and PYDV in Syria.

V 26

DETECTION OF THE MOST COMMON POTATO VIRUSES IN EGYPT AND SYRIA USING ELISA, RT-PCR AND NUCLEIC ACID HYBRIDIZATION TESTS. A. A. Shalaby¹, Amin Amer Haj kassem², Sahar Abdel-Aziz Youssef¹ and Najji Abou Zied¹. (1) Virus and Phytoplasma Research Department, Plant Pathology Research Institute, ARC, Giza, Egypt; (2) Plant Protection Department, Faculty of Agriculture, Aleppo University, Aleppo, Syria, Email: aahkasem@scs-net.org

Potato cultivars (*Solanum tuberosum* L.) in Egypt and Syria are infected with different viruses. Infected samples were collected during the two successive seasons 2003-2004 and 2004-2005 from different fields and cultivars in both Egypt and Syria that showed symptoms of infection such as leaf rolling, mottling, mosaic patterns on leaves and stunting of the plant. The presence of virus infection was detected by using the double-antibody sandwich enzyme-linked immunosorbent assay (DAS-ELISA), reverse transcriptase-polymerase chain reaction (RT-PCR) and DNA hybridization assays. *Potato virus X*, *Potato virus Y* and *Potato leaf roll virus* were detected in infected potato cultivars (cvs Cara and Draga) from Minufia and Qalubia Governorates in Egypt and potato cultivars (cvs. Draga and Ebla) collected from Aleppo and Edleb Governorates in Syria. These results indicated that the use of RT-PCR and DNA hybridization assays in routine diagnosis were found to be more reliable than ELISA and proved to be a useful tool in the confirmation of infection with PLRV, PVY and PVX even in symptomless tissue, which is important in disease surveys, seed health schemes and tissue culture programs.

V 27

LOCAL CERTIFIED POTATO SEEDS IN EGYPT: VIRUS AND OTHER PATHOGEN-FREE SEED PRODUCTION. Hamid Mahmoud Mazyad and Aboul-Ata Elnady Aboul-Ata, Department of Plant Virus and Phytoplasma Research, Plant Pathology Research Institute, ARC, Giza, P.O. Box 12619, Egypt, Email: hamidmazyad@yahoo.com, aeaboulata@yahoo.com

Twelve viral diseases were recorded to infect potatoes in Egypt. *Potato leaf roll virus (PLRV)*, *Potato Y virus (PVY)*, *Potato X virus (PVX)* are the most devastating virus infections in the Egyptian potato plantations. Field inspection for viral symptom expression as well as symptoms caused by *potato spindle tuber viroid (PSTVd)* were used to detect disease occurrence. Fungal diseases i.e. late blight and early blight, bacterial diseases i.e. Black leg and Bacterial wilt were also inspected. Virus-infection occurrence was confirmed using serological assay i.e. DAS-ELISA, and TBIA. Molecular biological methods (PCR and DNA hybridization using isotopic and non-isotopic materials) were used to detect PSTVd as well as other previously mentioned viruses for confirmation. Early detection, of virus, viroid and other pathogen infection is essential to eliminate virus-infected plants to prevent spread out through potato seeds to the new growing season. Moreover, tissue culture for virus-free potato production is used to eliminate virus and viroid infections. Production of micro and mini tubers were also used as an additional sources for virus-free material production. Forty thousand five hundred and twenty two feddan of potato fields grown at Sharkia, Gharbia, Dakahlia, Ismailia, Munofia, Behaira and Qualubia provinces were inspected for virus elimination. Potato varieties i.e. Diamond, Nicola, Lady Rosetta, Esponta, Mounaliza, Marmona, Moundial (A and E), Turbo, Draga, Easter Key, Squeiza (E), Baraka, Alpha, Kara, Niata, Kharies, Accent, Jasmine, Bikasso (A). were inspected in the field. Eighteen percent of total inspected potato seeds were rejected, as certified seeds, because of virus and other pathogen infection using previously mentioned system. This system has been modified recently by using more reliable, sensitive and inexpensive detection and elimination techniques as well as ministerial organization and documentations.

V 28

INCIDENCE AND DISTRIBUTION OF VIRUS DISEASES OF POTATO IN LEBANON WITH OBSERVATIONS ON OTHER MAJOR DISEASES. Elia Choueiri¹, Souheir El Zammar¹, Fouad Jreijiri¹, Rola El Amil¹, Adib Saad², Lucia Hanna², Said Ibrahim³ and Christina Varveri⁴. (1) Lebanese Agricultural Research Institute, Tal Amara, Rayak, Lebanon, Email: echoueiri@lari.gov.lb; (2) American University of Beirut, Lebanon. (3) Lebanese University, Beirut, Lebanon; (4) Benaki Phytopathological Institute, Athens, Greece.

The incidence, severity and distribution of six virus diseases were assessed in the main potato regions of the Bekaa valley, where 70% of potato production occurs. Observations on other diseases incited

by fungi, bacteria, as well as nematodes were also recorded. A total of 715 samples collected randomly from 40 fields during two growing seasons 2001/2002, and 300 samples were also taken from 25 fields during 2005. DAS ELISA test was applied during 2001/2002 to detect the occurrence of the following four major viruses: *Potato virus A* (PVA), *Potato virus X* (PVX), *Potato virus Y* (PVY) and *Potato leafroll virus* (PLRV); however, TBIA was used for the detection of the same viruses cited above in addition to *Potato virus M* (PVM) and *Potato virus S* (PVS) during 2005. Out of the 1015 collected samples, 520 (51.2%) were infected with one or more viruses. Potato virus Y was the most common, detected in 78.8% of the total number of infected samples collected during the three years, followed by PVA with an incidence of 13.4%, PVX (10.5%) and PLRV (7.6%). Incidence of PVM and PVS checked only during 2005 was 9.6% and 3.2% of the total number of infected samples, respectively. A specific isolate PVY^{NTN} was detected by immunocapture reverse transcription polymerase chain reaction (IC-RT-PCR) which causes tuber necrotic ring spot disease on the tubers of some varieties. Samples collected from plants showing symptoms indicative of diseases caused by fungal, bacterial, and nematodal pathogens were analyzed. The fungi *Rhizoctonia solani*, *Verticillium dahliae*, *Fusarium* sp., *Sclerotinia sclerotium*, the bacterium *Erwinia carotovora*, and the cyst nematode *Globodera rostochiensis* were the main pathogens found to be associated with the diseased plants. Quarantine diseases such as brown rot and ring rot were not encountered.

V 29

TRANSLOCATION AND DISTRIBUTION OF POTATO SPINDLE TUBER VIROID IN INFECTED PLANTS IN LIBYA. T. A. Abuhligha, S. Kryczynski and A. Stawiszynska, P.O. Box 81646, Tripoly, Libya, Email: majdaldeenlove@yahoo.com

Potato spindle tuber viroid (PSTVd) moved from inoculated tomato and chrysanthemum leaves to the rest of the plants four days after inoculation. In plants originating from lateral off-shoots after trimming of the inoculated plant below the site of inoculation, the viroid was detected one day earlier in plants grown from seedlings and trimmed above the site of inoculation. This indicates that the viroid moves first downwards and then upwards the stem and thus suggests that the viroid is translocated in the plant through phloem. This suggestion is supported by the severe symptoms seen on trimmed shoots than on intact shoots on the same plant. PSTVd was detected in leaves at various levels above and below the inoculated leaf, though generally the symptoms were more evident on leaves on the upper part of chrysanthemum and tomato plants. PSTVd was detected in only some eyes and sprouts of potato tubers from infected plants, an indication that viroid is not uniformly distributed in infected plants.

V 30

DETECTION OF A MILD STRAIN OF POTATO SPINDLE TUBER VIROID IN RAZAVI AND NORTHERN KHORASAN PROVINCES OF IRAN. A. Yazarlou, B. Jafarpour and M. Falahati Rastegar, Department of Plant Protection, Faculty of Agriculture, Ferdowsi University of Mashad, P.O. Box 91775-1163, Iran, Email: yazarlou771@yahoo.com

Potato spindle tuber viroid is a serious disease of potato which can cause significant yield losses. To detect PSTVd, tubers showing spindle shape and malformation symptoms were collected during the summer and fall of 2004 from different farms in Razavi and Northern khorasan provinces in Iran. Samples were stored in the cold room at 4° C. After tubers have passed dormancy period and started to germinate, they were planted under greenhouse conditions. The leaves of these potato plants were used for RNA extraction by the method of fractionated precipitation with PEG 6000. After extraction, RNA extracts were loaded on gels and fractionated by "denaturing polyacrylamide gel electrophoresis" at 60° C, and then stained with silver-staining. Specific viroid band in comparison with positive control, was observed. In another procedure, RNA extract was loaded on gels and fractionated by "return polyacrylamide gel electrophoresis" at two temperatures, 15° and 40 °C, followed by silver staining, The viroid band was observed. To confirm the results of the above detection methods, a RT-PCR test was conducted by using specific primers. After loading PCR products on polyacrylamid and agarose gel, 359 bp fragment was obtained. By digesting the RNA fragment with *Bam*HI restriction enzyme and loading on a gel, two fragments, 240 bp and 119 bp, were revealed. The extracted RNA viroid inoculated on healthy potatoes and tomatoes in greenhouse and infection of these plants has been confirmed by re-isolating the viroid by polyacrylamide gel electrophoresis. On the basis of mild host symptoms including slight dwarfing and twisting of leaves and also by determining

the RNA molecule sequence, it was concluded that the strain isolated from the region could be a mild strain of the viroid known as M14814. In this study, out of the 250 tubers tested, 14 tubers were found infected. This is the first report of a mild PSTVd strain detection in Razavi and Northern Khorasan provinces in Iran.

V 31

IDENTIFICATION AND DISTRIBUTION OF POTATO VIRUSES M AND A IN SOME PRODUCTION AREAS IN IRAN (KHORASAN PROVINCE) BY USING SEROLOGICAL AND MOLECULAR METHODS. Maryam Naghibzadeh, B. Jafarpour and M. Falahati Rastegar, Department of Plant Pathology, Faculty of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163, Iran, Email: maryam_naghib2003@yahoo.com

In the spring and summer of 2005, a survey was carried out to monitor *Potato virus M* (PVM) and *Potato virus A* (PVA) in potato fields in 10 locations in Khorasan province (Mashhad, Chenaran, Shirvan, Ghoochan, Faroodje, Bojnourd, Fariman, Kashmar, Neishabour and Torbat-e-heydariyeh). Samples showing mottling, mosaic, crinkling, shining and rolling of leaves were collected and stored in an ice chest and brought to the laboratory for identification. Some tubers were also collected. Tubers which passed dormancy at 4°C were transferred to the laboratory to allow them to germinate. To detect these viruses in collected samples, bioassay tests, serological (ELISA) and molecular (RT-PCR) methods were used. Total RNA was extracted from infected samples by using PEG 6000 precipitation method and cDNA was prepared. PCR was performed with specific primers which amplify the coat protein region. After electrophoresis on 1.5% agarose, the bands of 524 bp and 1100 bp were detected. These amplified regions were specific for PVM and PVA, respectively. ELISA results indicated that PVM was detected in samples collected from Kashmar, Torbat-e-heydarieh and Neishabour, whereas PVA was detected only in samples collected from Kashmar. This is the first report of potato infection with PVM and PVA in Khorasan province in Iran.

V 32

FIRST RECORD OF SWEET POTATO FEATHERY MOTTLE VIRUS AND CUCUMBER MOSAIC VIRUS IN SWEET POTATO (*IPOMOEA BATATAS*) IN SYRIA. Ensaf Akel¹, Imad Ismail² and Salem Raii². (1) Agricultural Research Centr, Lattakia, General Commission of Agricultural Scientific Research, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria, Email: ensaf_akel@hotmail.com

A survey to identify sweetpotato (*Ipomoea batata*) viruses in the main cultivating areas along the Syrian coast was conducted during 2001/2002 and 2002/2003 growing seasons. One thousand one hundred and eighteen samples with symptoms suggestive of virus infection such as mosaic, vein-clearing, vein-banding, mottling, yellowing, stunting, and leaf distortion, were collected from 63 fields in 12 regions. These samples were tested by tissue blot immunobinding assay (TBIA) using antisera against selected sweet potato viruses: *Sweet potato feathery mottle virus* (SPFMV), *Sweet potato mild mottle virus* (SPMMV), *Sweet potato chlorotic fleck virus* (SPCFV), *Sweet potato latent virus* (SwPLV), *Sweet potato chlorotic stunt virus* (SPCSV), *Sweet potato caulimo virus* (SPCaLV), *Sweet potato mild speckling virus* (SPMSV), and a potyvirus (C-6V), and against *Cucumber mosaic virus* (CMV). Results showed that there are two viruses which naturally infect sweet potato crops in Syria, SPFMV and CMV alone or in mixed infection. This is the first report of a natural infection of sweetpotato plants with SPFMV and CMV in Syria.

V 33

SURVEY OF WEED AND INSECTS ASSOCIATED WITH *SESAMUM INDICUM* L CROP AND EVALUATION OF TRANSMISSION METHODS OF THE PHYTOPLASMA CAUSING PHYLLODY DISEASE TO SESAME CROP. Ayad Abdulwahd Al-Heety and Oadi Najim Al-Hadethy, Department of Plant Protection, Collage of Agriculture, University of Baghdad, Abu-Ghareib, Baghdad, Iraq, Email: Udayal_hadethy@yahoo.com

The survey at the College of Agriculture Experimental Farms and Al-Raed Research Station showed that incidence of sesame plants infected with phyllody was 5 and 14%, respectively in 2000 and 2001. Weed plants of different species were also recorded and several species showed symptoms of phytoplasma infections. *Euphorbia helioscopia* and *Lactuca scariola* showed Phyllody symptom, *Schangania aegyptiaca* showed Witches broom symptom, *Lagonychium farctum* showed Fasciation symptom. In addition, several

species of insects were found to be associated with the crop (*Orosius albicinctus* Dis, *Sogatella vibix* Haupt., *Zygina hussaini*, *Bemissia tabaci* Geun., *Antigastra oatalaunalis* Dup., *Cornifrons ulceratalis* Led). Experimentally, several ways of phyllody transmission to sesame were examined. The highest transmission rate (100%) was achieved by grafting, produced symptoms 30 days after grafting. The leafhopper *O. albicinctus*, among the examined leafhopper species, transmitted the disease and produced symptoms 30 days after feeding on healthy sesame plants.

V 34

EFFECT OF MIXED AND SINGLE INFECTION WITH BEAN YELLOW MOSAIC VIRUS AND *ALTERNARIA ALTERNATA* ON BROAD BEAN. Khalid Al-Barzangy¹ and Nadeem A. Ramadan². (1) Pl. Protection Department of College of Agriculture, Salah Al-Den University, Iraq; (2) Biology Department of Collage of Sciences/Mosul University, Iraq, Email: saidkhalid88@yahoo.com

The results of the field survey in Erbil and Nineva governorates revealed the distribution of the mosaic disease caused by *Bean yellow mosaic virus* (BYMV) and leaf spot disease caused by the fungus *Alternaria alternata* in faba bean. The virus was identified by the external and internal symptoms on infected faba bean, host range, physical properties and serological tests as a strain of BYMV. Amorphous granular inclusion bodies were detected near the nucleus in epidermal cells of the infected faba bean plants. Eight plant species belonging to four families were infected by the virus. The Serological tests agglutination, agar double-diffusion, enzyme-linked Immunosorbent assay and tissue blot immunoassay confirmed the virus to be BYMV. Mixed infection of BYMV and the fungus *A. alternata* decreased the height of infected plants and produced less number of branches, leaves, flowers, root nodules and the *Alternaria* spot size on the upper leaves. The infection with either pathogen resulted in lower content of chlorophyll a, b and total chlorophyll. The reduction reached 17.31, 23.5 and 23.9%, respectively due to BYMV infection and 22.57, 33.13 and 32.75%, respectively due to *A. alternata* infection. The reduction due to mixed infection of the virus and the fungus in the first stage reached 48.71, 49.73 and 48.77%, respectively. The virus infection increased the amount of nitrogen, whereas it decreased in the plants infected with *A. alternata*. The plants infected with both the virus and the fungus in the second stage had a significant increase in the amount of nitrogen in comparison with healthy or plants infected with the fungus. The fungus *A. alternata* caused a significant increase of the carbohydrate content in comparison with healthy plants and infected plants with the virus and the fungus in both stages. Infected plants with both the virus and the fungus in both stages caused significant decrease in carbohydrates content, which reached 4.2 and 2.7g/100g dry weight, respectively.

V 35

PREVALENCE AND SPREAD OF THREE VIRUSES (AMV, BCMV, BYMV) ON FABA BEAN IN RIYADH AND QASSIM REGIONS, SAUDI ARABIA. Khalid A. Al-Jamhan and Ibrahim M. Al-shahwan, Department of Plant Protection, College of Food and Agricultural Sciences, King Saud University, P.O. Box 2460, Riyadh 11450, Saudi Arabia, Email: ishahwan@ksu.edu.sa

A total of 227 faba bean (*Vicia faba* L.) plant samples showing virus-like symptoms were collected from fields of faba bean grown in Riyadh and Qassim regions during two consecutive seasons (2002-2003). The plant samples were examined for the presence of three plant viruses: alfalfa mosaic virus (AMV), bean common mosaic virus (BCMV), and bean yellow mosaic virus (BYMV). The three viruses were detected serologically in both regions and growing seasons using ELISA test. BCMV was the most detected virus in the tested samples accounting for 80.87 %, followed by BYMV at 61.73 %, and AMV at 20.58 %. None of the three viruses was detected in 35 of the collected samples which accounted for 12.60 %. This is the first study in which BYMV was detected in the Kingdom of Saudi Arabia and from faba bean samples in Riyadh and Qassim regions. AMV was also detected for the first time from faba bean in the two regions. This is also the first report on the occurrence of BCMV in faba bean fields in Qassim region.

V 36

NEW VIRUSES CAUSING YELLOWING AND STUNTING SYMPTOMS AFFECTING COOL-SEASON FOOD LEGUMES IN SYRIA. Safaa G. Kumari, Khaled Makkouk, Nouran Attar, Nader Asaad, Rana Al Jallad and Mohamad Al Khalaf, Virology Laboratory, International Center for Agriculture Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org

Viruses causing yellowing/stunting symptoms are the most important virus diseases affecting cool-season food legumes (faba bean, chickpea and lentil) in Syria, and in some years these viruses have caused almost complete failure of the chickpea and faba bean crops. Recently surveys conducted in production areas showed that there are at least 6-8 viruses that produce similar symptoms (mostly leaf-rolling, yellowing and stunting of infected plants) in food legume crops. Knowing the exact identity of a virus affecting a crop in a region is essential for breeding for resistance and crop management purposes. Thus, it is essential to have diagnostic reagents available to identify the viruses and their variants and monitor their incidence and distribution. A large number of samples with yellowing/stunting symptoms were collected during the 2004/2005 and 2005/2006 growing seasons and tested using both (i) the serologically-based tissue blot immunoassay (TBIA) technique using a battery of specific monoclonal and polyclonal antibodies and (ii) the molecular based polymerase chain reaction (PCR) using specific primers for *Luteoviridae* and *Nanoviridae* Viruses. Results showed that the viruses causing yellowing/stunting in cool season-food legumes in Syria are mainly two ssDNA viruses (*Faba bean necrotic yellows virus* and *Chickpea chlorotic dwarf virus* and three ssRNA viruses (*Bean leafroll virus*, *Beet western yellows virus* and *Soybean dwarf virus*). In addition, large number of plants with yellowing symptoms did not react with either specific monoclonal antibodies or with specific primers. Further testing (serology, PCR, sequencing of coat protein gene and aphid transmission) showed that most of these plants were infected with a *Polerovirus* (family *Luteoviridae*) and transmitted mainly by *Aphis craccivora* Koch in a persistent manner. In addition, the incidence of these viruses was higher than other viruses especially during the 2005/2006 growing season and in early planted fields. Virus incidence with the *Polerovirus* in some faba bean fields in the coastal area and El-Ghab valley was higher than 50%, and high yield loss was noted on infected plants. This is the first report of such a virus in Syria. The use of PCR technology and sequencing with reference to detection and characterization of *Luteoviridae* are discussed in this paper.

V 37

EFFECT OF TEMPERATURE AND STORAGE CONDITIONS ON THE EFFECTIVENESS OF TISSUE BLOT IMMUNOASSAY IN DETECTING PLANT VIRUSES. N. Attar, S. Kumari and K. Makkouk, Virology Laboratory, International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org

The Tissue blot immunoassay (TBIA) is considered among the fastest and most cost-effective tests for the detection of plant viruses. This test permits easy transfer of blotted samples to be processed at distant locations, within or outside a country. The objective of this investigation was to assess the effect of storage duration and temperature during storage or mailing on virus detection by TBIA. Stems of faba bean infected with *Bean yellow mosaic virus* (BYMV) and *Faba bean necrotic yellows virus* (FBNYV) were cut and blotted several times on nitrocellulose membrane and then stored at different temperatures and durations. A BYMV polyclonal antiserum and a FBNYV monoclonal antibody were used in the test. It was found that storage duration (up to 9 years at room temperature) did not have an effect on the sensitivity of detection of both viruses. Furthermore, both viruses were easily detected when membranes were exposed to 80 °C for 10 days, but the intensity of the reaction was inversely proportional to the length of the exposure period. The results of this study clearly showed that virus particles blotted on the nitrocellulose membrane were fairly stable and can withstand bad storage conditions without a significant effect on virus detection.

V 38

DISTRIBUTION AND MANAGEMENT OF BEAN YELLOW MOSAIC VIRUS ON FABA BEAN IN SYRIA. Mohamed Khalaf, Safaa Kumari, Amin Haj Kasem, Khaled Makkouk and Salah El-Chaabi. (1) General Commission of Scientific Agricultural Research (GCSAR), Al-Ghab Station, Syria, Email: virology@icarda.exch.cgiar.org; (2) Virology Laboratory, ICARDA, P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org; (3) Faculty of Agriculture, Aleppo University, Aleppo, Syria; (4) GCSAR, Douma, P.O. Box 113, Damascus, Syria.

A survey was conducted during the 2004/2005 growing season to assess the incidence and distribution of *Bean yellow mosaic virus* (BYMV, genus *Potyvirus*, family *Potyviridae*) on faba bean crops at four main regions (costal, northern, southern and middle) in Syria. A total of 1257 faba bean samples with symptoms suggestive of virus infection and 10785 randomly collected samples (average 150-200 samples/field) were obtained from 67 fields. All samples were tested for the presence of BYMV using Tissue-blot immunoassay (TBIA). Virus incidence based on field inspection was 46.3, 41.9, 33.8 and 2.7% in costal, northern, southern and middle regions, respectively; and the virus incidence of the randomly collected samples based on serological test was 14.2, 5.0, 10.0 and 3.0% for the above four regions, respectively. A total of 377 faba bean accessions, originating from 16 countries, were evaluated during 2004/2005 growing season under field conditions for their reaction to a Syrian isolate of BYMV. At the 4-leaf stage, all plants were inoculated mechanically and one replicate was kept as control. Results showed that all accessions were susceptible and the virus infection based on the development of the characteristic symptoms of BYMV (mosaic, mottling, stunting) ranged between 50-100%, except two accessions (ILB 474 and BPL 4184) were moderately susceptible with virus infection rate of 40 and 43%, respectively. Results showed that yield loss ranged between 1% (ILB 3059) and 92% (BPL 1399). The harvested seeds from the screening experiment were used to study BYMV seed-transmission rate. All seeds were planted in trays with sand, and germinated seedlings were tested for the presence of BYMV using TBIA. Results revealed that BYMV transmitted in seeds of 25 accessions and seed-transmission rate ranged between 0.51-6.17%, whereas seed-transmission rate was very low (0-0.5%) in 352 accessions. In addition, infection with BYMV affected the color and shape of the seeds, thus, reducing their marketability (especially for canning). Results of the management experiment at Tel-Hadya during 2004/2005 growing season showed that four foliar sprays during the season either with Pirimor (Pirimcarb; 0.2 g a.i./lit) or with mineral oil 3% were not effective in reducing the spread of BYMV.

V 39

INTEGRATED MANAGEMENT OF APHID-TRANSMITTED FABA BEAN VIRUSES IN THE COASTAL AREA OF SYRIA. Rana Al-Jallad¹, Safaa G. Kumari² and Imad Ismail¹. (1) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria; (2) Virology Laboratory, International Center for Agriculture Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org

Field experiments were conducted at the coastal area of Syria during the 2004/2005 and 2005/2006 growing seasons to investigate the effects of a number of management components [(planting date, plant density, seed dressing with Gaucho (Imidacloprid), cereal border (wheat) and foliar spray with insecticide and mineral oil)] in reducing the spread of aphid-transmitted faba bean viruses. Virus incidence in early planting (mid-November) was higher (75%) than late planting (early December) (5%). Virus incidence decreased by 30-35% in the plots planted with seeds treated with Imidacloprid (1.4 g a.i./kg of seeds), compared with non-treated plots. Virus incidence decreased by 10% in plots with high plant density (33 plants/m²) compared with plots with low plant density (22 plants/m²). Foliar spray with Pirimor (Pirimcarb; 0.2 g a.i./lit), mineral oil only, or both Pirimor and mineral oil during the season were not effective in reducing the spread of persistently aphid-transmitted viruses. Spraying with either mineral oil or Pirimcarb and mineral oil reduced the spread of non-persistently aphid-transmitted viruses. However, virus incidence with persistently aphid-transmitted viruses (*Faba bean necrotic yellows virus* and Luteoviruses) was higher than with non-persistently aphid-transmitted viruses (*Bean yellow mosaic virus* and *Broad bean wilt virus*), in both growing seasons. In addition, results show that wheat border did not reduce the spread of persistently-transmitted viruses, but decreased the spread of non-persistently transmitted viruses. In general, virus incidence under natural infection in the coastal area during the second growing season was higher than

in the first season. Moreover, the virus incidence observed in experimental plots was more-or-less similar to the situation in farmers' fields. Results indicate that the combination of late planting, Imidacloprid seed treatment, and a plant density of 33 plants/m² were an effective management option to reduce virus disease incidence in faba bean fields along the coastal area of Syria.

V 40

DATA BASE MANAGEMENT SYSTEMS IN IPM PROGRAMS FOR FBNYV-APHID VECTORS CONTROL ON FABA BEAN FARMERS' FIELDS IN EGYPT. Gouda M. El-Defrawi¹, Magdy A.E. El-Hariry¹, Hamed A.M. El-Sayed¹, Lattif R. Rizkalla² and Rashad Abo Elenien³. (1) Plant Protection Research Institute, 7th Nadi-El-Sayed street, Dokki, Cairo, Egypt, Email: Aya-Gouda@hotmail.com; (2) Plant Diseases Research Institute; (3) Field Crops Research Institute, ARC, Giza, Egypt.

Faba bean (*Vicia faba* L.) is the major food legume crop in Egypt. Grain production is affected mainly by a number of arthropod pests and diseases. Dramatic damage by the aphid results from transmission of several plant viruses, especially *Faba bean necrotic yellows virus* (FBNYV) and *Bean leafroll virus* (BLRV). Both viruses are transmitted in the persistent manner by several aphid species, which the cowpea aphid, *Aphis craccivora* and the pea aphid, *Acyrtosiphon pisum*, seems to be the most important vectors in Egypt. Control measures for these viral vectors are best based on knowledge of its "ecological life cycle". Work over the last decade has provided much information on the ecology and phenology of vectors. Timing of arrival of aphid vectors flying into legume and non-legume in the autumn and assessment the numbers are based on data collected from 20 sites using yellow-pan water traps distributed throughout middle Egypt. A viral diagnostic is used to measure the infectivity of these aphids. A weather condition, particularly temperature, was the most important factors affecting risk of infection with FBNYV. Successful attempts to control vectors were made over the last eight seasons using combinations of measures. The IPM system followed comprised of four sub-systems: the technical strategy and control techniques, monitoring, decision-making and extension. This system was demonstrated and extended to the major faba bean producing provinces of middle and Upper Egypt during 1998-2006, and achieved significant economic, social and ecological benefits.

V 41

FORAGE LEGUME VIRUSES IN SYRIA: ECONOMIC IMPORTANCE AND SEED TRANSMISSION. Muhammad Jamal Mando¹, H. Z. Kawas², K.M. Makkouk³ and S.G. Kumari³. (1) Pathology Division, Plant Protection Administration, General commission for Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria, Email: jamalagr@mail.sy; (2) Plant Protection Division, Faculty of Agriculture, Damascus University, Syria. (3) Virology Laboratory, International Center for Agricultural Research in the Dry Areas, (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: S.Kumari@cgiar.org

Field survey was conducted to determine the distribution of viruses infecting forage legumes (alfalfa, clover, vetch, chickling and bitter vetch) in Syria during 2001/2002 and 2002/2003 growing seasons. 47 fields were visited and 5656 samples were collected (5300 samples collected randomly in both growing seasons to determine infection rate and 356 samples showing typical symptoms of virus infection were collected during the second season). Alfalfa fields were visited in the first growing season, whereas alfalfa, clover, vetch, chickling and bitter vetch were visited in the second growing season. Results of tissue blot immunoassay (TBIA) for samples randomly collected from alfalfa fields in 2001/2002 growing season showed that *Alfalfa mosaic virus* (AMV) was the most common (19.96%), followed by virus members of the family Luteoviridae (12.2%), *Cucumber mosaic virus* (CMV) (7.37%) and *Bean yellow mosaic virus* (BYMV) (5%), whereas in 2002/2003 growing season, low incidence was noticed for each of AMV (1.91%), *Pea seed borne mosaic virus* (PSbMV) 0.87%, and Luteoviruses (3.87%). When using specific antibodies to distinguish luteoviruses infecting forage legumes in Syria, *Bean leaf roll virus* (BLRV), *Soybean dwarf virus* (SbDV) and *Beet western yellows virus* (BWYV) were identified, while some of these samples (16.52%) were negative to all specific monoclonal antibodies used for this group. In addition, 173 samples were negative to all the nine antisera, although they showed typical symptoms of viral infection. Alfalfa seeds collected from 5 locations (1000 seeds/location) from seed dealers were tested. Results showed that *Alfalfa mosaic virus* was detected in seeds from two locations at 0.6 and 0.2% seed transmission rates.

V 42

ALFALFA MOSAIC VIRUS: HOST RANGE, PURIFICATION, MODES OF TRANSMISSION AND SEROLOGY. Gaber Fegla¹, Yehia El-Faham¹ and Mervat Fathalla². (1) Plant Pathology Department, Faculty of Agriculture, Alexandria University, Alexandria, Egypt, Email: gaberfegla@yahoo.com; mahakawanna@yahoo.com; (2) Plant Pathology Institute, Agriculture Research Center, Alexandria, Egypt.

Three isolates of *Alfalfa mosaic virus* (AMV) varied in symptoms severity on alfalfa were isolated and identified from naturally infected alfalfa plants grown at El-Beheira Governorate, Egypt. Two methods were used to purify AMV isolate 1. Yield of the purified virus by method 1 was about 15 mg and by method 2 was 26.82 mg/100 g fresh weight of *Nicotiana glutinosa*. Antiserum for isolate 1 was produced, which reacted strongly and had a high titer with isolates 1 and 2, while reacted weakly and had a low titer with isolate 3 in microprecipitin test and indirect ELISA. The virus was seed- and aphid-transmitted. Four aphid species could transmit the virus in a non persistent manner, and *Aphis craccivora* was the most effective while *A. nerii* did not transmit the virus. Results of virus detection in seeds, seed parts and seedlings of two alfalfa cvs: Siriver and El-Wadi El-Gadid revealed that indirect ELISA was more sensitive than infectivity test. Infectivity test did not detect the viral antigen in the separated seed coats. Rate of infected plants was higher in 21 days old than in 5 days old seedlings when ELISA or infectivity tests were used in detection. When TBIA was used for testing 21 days old seedlings, higher rate of infected seedlings (17% in cv. Siriver and 12.5% in cv. El-Wadi El-Gadid) was detected as compared with indirect ELISA or infectivity test.

V 43

COMPARISON BETWEEN DIFFERENT SEROLOGICAL METHODS FOR DETECTION OF ALFALFA MOSAIC VIRUS. Mervat Fathalla¹, Gaber Fegla² and Yehia EL-Faham². (1) Institute of Plant Pathology, Agriculture Research Center, Sabhia Research Station, Alexandria, Egypt, Email: mmmf-1992@yahoo.com; (2) Plant Pathology Department, Faculty of Agriculture, Alexandria University, Alexandria, Egypt.

Sensitivities of three serological tests, optimized Dot Immunobinding Assay (DIA), Indirect enzyme-linked Immunosorbent Assay (ELISA) and Tissue Blot Immunobinding Assay (TBIA) were compared for detecting *Alfalfa mosaic virus* (AMV) in different plant organs of *Nicotiana glutinosa* plants as well as in leaves at different periods after inoculation. Results showed that indirect ELISA was more sensitive than indirect DIA. Indirect ELISA detected the virus in sap extracted diluted up to $1:5 \times 10^3$ in roots $1:5 \times 10^4$ in stems and $1:10^5$ in leaves, whereas, with indirect DIA the virus could be detected in sap extracted from roots, stems and leaves of infected plants at dilution up to $1:5 \times 10^2$, $1:5 \times 10^3$ and $1:10^4$, respectively. TBIA easily detect AMV in roots, stems and leaves of infected plants. When the tests were compared for detecting the virus in 1:100 diluted sap extracted from leaves of infected plants, after different period of mechanical inoculation, results showed that sensitivity of DIA was similar to that of indirect ELISA, which could detect AMV 8, 16 and 24 days after mechanical inoculation, whereas the virus was detected 4, 8, 16 and 24 days after inoculation by TBIA.

V 44

BARLEY YELLOW DWARF VIRUS: OCCURRENCE IN CEREAL CROPS AND WILD GRASSES, EFFECT ON YIELD AND ITS COMPONENTS AND ITS INTEGRATED MANAGEMENT UNDER SYRIAN CONDITIONS. Adel Ansi¹, Safaa G. Kumari², Amin Haj Kasem¹, Khaled M. Makkouk² and Ismail Muharram³. (1) Faculty of Agriculture, Aleppo University, Aleppo, Syria; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org; (3) Agricultural Research and Extension Authority, P.O. Box 87285, Dhamar, Yemen.

A survey was conducted during 2003/2004 and 2004/2005 growing seasons to assess the incidence and distribution of *Barley yellow dwarf viruses* (BYDVs, family *Luteoviridae*) on cereal crops in Syria. The survey covered 117 randomly selected fields (28 barley, 84 wheat, 2 oat and 3 maize) in north, middle, south and east of Syria. A total of 200 randomly collected samples and 15-20 symptomatic samples from each field were tested by tissue-blot immunoassay (TBIA). Laboratory testing indicated that BYDV-PAV was detected in barley, wheat, oat and maize, and virus incidence reached 6.7, 4.1, 33 and 5% in randomly collected samples and 14.6, 9.3, 62.5 and 17.5% in symptomatic samples of these crops, respectively.

BYDV was monitored in wild grasses during the period January - October, 2005 in nine fields around Tel-Hadya area (north of Syria). Laboratory testing indicated that BYDV-PAV was detected in three annual grasses grown within barley and wheat crops [*Avena sterilis* L., *Lolium rigidum* Gaud., *Phalaris*. spp], two perennial grasses [*Sorghum halepense* L. and *Cynodon dactylon* (L.) Pers.] and two annual grasses grown with summer crops [*Echinochloa colonum* (L.) Link. and *Setaria viridis* (L.) P.B.]. This is the first report of BYDV-PAV infecting cereal grasses in Syria. Under artificial BYDV inoculation in the field and using barley cv. "Alanda", virus infection reduced grain yield, biomass and 1000-kernels weight by 82, 76 and 30%, respectively. A field experiment was carried out at three locations (Harran, Yahmmol and Tel-Hadya) north of Syria during 2004/2005 growing season, to evaluate cultural practices which can reduce virus incidence in the field. Results showed that virus incidence was reduced and grain yield was increased in all locations when seeds were planted early (1-15 December) compared to late planting (15-30 January). Low plant density (200 seeds/m²) led to higher virus incidence (34.3%) than high plant density (300 seeds/m²) (less than 5%). Seed treatment with Imidacloprid (1.8 g a.i./kg) effectively reduced BYDV incidence. whereas foliar spray with Pirimor (Pirimcarb; 0.2 g a.i./ lit) applied five times during the growing season had no effect on virus spread.

V 45

BARLEY YELLOW DWARF VIRUS IN TUNISIA: DISTRIBUTION ON BARLEY CROP, EFFECT ON YIELD AND IDENTIFICATION OF RESISTANT GRNOTYPES. Asma Najar¹, A.R. Daaloul¹, K. Makkouk² and S. Kumari². (1) National Agricultural Research Institute of Tunisia, 2049 Ariana, Tunisia, Email: najar.asma@iresa.agrinet.tn; (2) International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria.

Field survey was conducted during 2000-2005 in the major barley growing areas in Tunisia (Baja. Al-Cap, Benzert, El-Kaf, El-Kreeb, Zaghwan, Kairawan) to evaluate the distribution of *Barley yellow dwarf virus* (BYDV) in the different regions. Around 200 random and 15-20 symptomatic samples were collected from each field. All samples were tested by the tissue-blot immunoassay (TBIA). Virus incidence, mostly BYDV-PAV, varied among locations between 1.2 and 30.97% in randomly collected samples (5.45, 14.46, 30.97, 7.66, 15.37, 2.35 and 1.2%) in the above mentioned locations, respectively. In an experiment in Baja, the effect of seed treatment with a systemic insecticide on reducing BYDV spread was evaluated. Seeds of four barley cultivars were treated with imidacloprid (Gaucho) at the rate of 2 g a.i./Kg of seed were evaluated, together with a non-treated control. All treatments were artificially inoculated with BYDV, by using a viruliferous aphid vector, at the 2 leaf stage. Results showed that BYDV incidence was reduced from 97% (in non-treated control) to 28.5% in treated plots. Segregation in 10 families from F₂ to F₅ obtained from crossing BYDV resistant barleys (with *Yd₂* gene) with susceptible barleys (lacking the *Yd₂* gene) permitted the identification and selection of 200 barley lines resistant to BYDV.

V 46

EFFECT THE AGE OF BARLEY PLANTS INOCULATED WITH *BARLEY YELLOW DWARF VIRUS* ON GRAIN YIELD AND ITS CONTROL BY SEED TREATMENT. W. Ghulam, S. Kumari and K. Makkouk, International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: s.kumari@cgiar.org

Barley yellow dwarf virus (BYDV) is among the most important viruses which reduce barley grain yield, which is largely dependent on the variety and time of infection. An experiment was conducted at Tel Hadya to study the effect of BYDV inoculation at three different growth stages (3-leaf, tillering and stem elongation stages) on two BYDV-resistant cvs. that have the *Yd₂* gene (Atlas 68 and Sutter), and two susceptible cvs. that lack the *Yd₂* gene (Atlas 57 and Cyclon). Plants were artificially inoculated with the cherry oat aphid (*Rhopalosiphum padi*) which acquired BYDV-PAV from barley infected plants. Grain yield loss obtained in the barley varieties was 94, 72, 39% (Cyclon); 40, 26, 43% (Atlas 57); 13, 3, 3% (Atlas 68); 13, 14, 5% (Sutter), when inoculated at the three different growth stages, respectively. When the seeds of the varieties Sutter (+*Yd₂*) and Cyclon (-*Yd₂*) were treated with Imidacloprid (1.4 g a.i./Kg of seeds) and Thiamethoxam (0.5 g a.i./Kg of seeds) before sowing, different responses were obtained following inoculation with BYDV-PAV at the 3-leaf stage. Seed treatment with Imidacloprid reduced BYDV incidence in the varieties Sutter and Cyclon from 98 and 100% in plots sown with non-treated seeds to 62

and 84% in plots with treated seeds, respectively. On the contrary, seed treatment with Thiamethoxam had no effect on virus incidence.

V 47

MARKER-ASSISTED SELECTION FOR BARLEY YELLOW DWARF VIRUS RESISTANCE GENES *Yd2* AND *Yd3* IN BARLEY. Haitham Sayed, S. Kumari, M. Baum, W. Ghulam, S. Grando and K. Makkouk. International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria, Email: h.sayed@cgiar.org; m.baum@cgiar.org

Barley yellow dwarf virus (BYDV) (family *Luteoviridae*) is economically the most important viral disease of cereal grains worldwide. Characteristic symptoms of BYDV infected plants are stunted growth, leaf discoloration, and shriveled grain. The most effective way to limit economic losses from this disease is by planting resistant or tolerant cultivars. Only a few genes have been reported to confer resistance in barley, such as *Yd2*, located on chromosome 3H of barley. In addition to *Yd2*, several QTLs for tolerance to BYDV have been mapped in some cultivars. The *Yd3* gene on chromosome 6H may be the second most important resistance gene against BYDV. In this study, seeds of 88 Ethiopian barley accessions held at the Vavilov Institute and at ICARDA gene banks were planted in the field during 2002/2003 growing season, and all plants were artificially inoculated with BYDV-PAV by viruliferous *Rhopalosiphum padi*, using 10-15 aphids/plant. Plants were tested 30 days after inoculation, by tissue-blot immunoassay to monitor BYDV concentration in the plants. A total of 107 plants from 19 accessions with mild symptoms and low virus concentration were harvested individually and re-planted in the plastic house for further analysis. All seedlings were tested by PCR for the presence of *Yd2* gene using YLP-CAPS marker, and 38 plants from 14 accessions lacked the *Yd2* gene. This panel of 38 plants, in addition to five resistant parental lines with *Yd2* gene (Laural, Ligne527/NK//JLB, Sutter/Sutter*2/Numare, Wysor, QB 813.2) and two susceptible parental lines for BYDV (Morrison and Cyclon) were tested with a set of microsatellite markers (HVM22, HVM14, HVM65, HVM74, and Bmac0018) closely linked to the *Yd3* gene on 6H chromosome. Some of the parental lines harbor either *Yd2* (e.g. Wysor), or *Yd3* (e.g. Granada) or both genes (e.g. Laural). Marker Bmac0018 amplified a resistant allele in all of the 38 resistant plants. *Yd2* and *Yd3* genes seemed to reduce the chance to establish infection of the viral isolate used in this study. The availability of these markers makes it possible to quickly identify the presence of the *Yd2*, *Yd3* or both of them in one genotype. The PCR screening method provides a rapid and efficient method that if optimized could be used to screen thousands of barley lines for BYDV resistance at the seedling stage based on *Yd2* and *Yd3* and possibly to identify resistances based on genes other than *Yd2* and *Yd3*.

V 48

STUDY ON BARLEY STRIPE MOSAIC VIRUS DISEASE IN ALGERIA. Khalidia Medjahed. Department of Agronomy, Laboratory of Virology, University of Blida, Blida, Algeria, Email: henene_2@yahoo.fr

Barley stripe mosaic virus (BSMV) is one of the few seed-borne viruses of grasses. Initially, the virus was reported to occur in North America, then it was recorded in several countries of the world. The main objective of this study was to detect and identify BSMV in 37 varieties of barley and 10 varieties of durum wheat. The study was conducted in two different experimental stations of ITGC, namely Oued Smar and Beni Slimene in Algeria. The serological DAS-ELISA test was used in this study. In addition, epidemiological study was carried out at the Institute of Agronomy of Blida, Algeria to follow-up the disease development of BSMV at the different the growth stages of the plant. BSMV was detected in 26 barley and 7 durum wheat varieties tested.

V 49

SURVEY OF CUCURBITS VIRAL DISEASES IN SOUTHERN SYRIA, AND SCREENING OF CUCURBITS CULTIVAR FOR RESISTANCE TO NATURAL INFECTION. Houda Kawas, Plant protection Department, University of Damascus, Damascus, Syria, Email: houdakawas@yahoo.com

A field survey was conducted during 1996-2001 growing seasons to determine viral diseases affecting cucurbits in southern Syria. A total of 122 cucurbit fields were visited between April and October, and 2140 plant samples with typical symptoms of virus infection were collected from Damascus, Damascus

countryside and Daraa. Viral diseases incidence based on to field symptoms ranged between 1-89% for all seasons, and was highest in squash fields in Damascus countryside in autumn growing periods during 1997/1998 and 1998/1999 seasons. Incidence of viral infection based on field symptoms for squash, cucumber, melon, watermelon, pumpkin, Bottle gourd, loofah, Winter gourd, Snake cucumber and Adzhure was in the range of 46-89%, 8-45%, 12-41%, 7-18%, 9-21%, 5-10%, 6-12% and 1-3%, respectively. Serological tests obtained by enzyme-linked immunosorbent assay (ELISA) revealed the presence of *Zucchini yellow mosaic virus* as the most commonly encountered virus in cucurbit fields, and reached 62% in the collected Squash samples. 40% of the infected samples collected harbored more than one virus. The rate of infection in the collected cucurbits species with *Zucchini yellow mosaic virus*, *Papaya ring spot virus*, *Squash mosaic virus*, *Tomato spotted wilt virus*, *Cucumber mosaic virus*, *Cucumber aphid-borne yellow virus*, *Watermelon mosaic virus-2*, *Zucchini yellow fleck virus*, *Alfalfa mosaic virus*, *Melon necrotic spot virus* and *Cucumber green mottle mosaic virus* was 57.7, 32.8, 23.8, 23.2, 23.1, 22.6, 19.7, 13.6, 8.5, 5.0 and 5.0%, respectively. This is the first record of natural infection of cucurbits with TSWV and CABYV in Syria. Among the 30 squash cultivars, Romy, R-ZYMV, CX 4712287, XP4843396, Sahar, Amcobella, karam, Joud, Salama F1, Shamy, Claudina, Omega, Malika, Nour F1, Zahra, CX 4710507, BX3313897, 1019, VGS 234007 and Samara were resistant. Among the 23 cucumber cultivars screened, Samara, Doora, Zena, Jericho, Prince, Bondone, Reia, GGF 7119002, GCF7199 and BA1045 F1 were resistant. From 21 melon cultivars screened, Shaizer, Androws, Concert, Super45, Rania, Mercedes, AmcoSweet and Diamante were resistant to viral infection during 4 seasons under field conditions. Cucurbit cultivars reacted differently to by mechanical inoculation with ZYMV isolates (SSq.15.96, SM.3.98 and SCu.12.96) under growth chamber conditions. Local varieties of pumpkin and loofah were tolerant to infection with local isolates of ZYMV with late and less severe symptoms.

V 50

NEW SQUASH VARIETY MODERETLY RESISTANT TO ZUCCHINI YELLOW MOSIAC VIRUS. Abd Al-Basit Abbas Al-Janabi and Sarab Abd El-Hadi, Plant Pathology Department, Agriculture and Food Technology Directorate, Ministry of Science and Technology, P.O. Box 765, Baghdad, Iraq. Email: ealmaarroof@yahoo.com

Five squash varieties originated from crosses of Clarita cultivar and Ghazalah hybrid were evaluated for their general and specific combining ability. The cross hybrids 2014*2020, 2015*2017 and 2015*2019 were the best in productivity, and the hybrid 2015*2019 was the best in both productivity and resistance to *Zucchini yellow mosaic virus* (ZYMV).

V 51

IDENTIFICATION OF ONION YELOW DWARF VIRUS AS ONE OF THE MAJOR VIRUSES INFECTING GARLIC IN EGYPT. Sabry Younis Mohamed Mahmoud¹ and Mamdouh Hosain Abdel-Ghaffar². (1) Agricultural Botany Department, Faculty of Agriculture, Sohag, 82786, South Valley University, Egypt, Email: sabryaraby2003@yahoo.com; (2) Virology Laboratory, Department of Agriculture Microbiology, Ain Shams University, P.O. Box 68, Hadayek Shubra 11248, Cairo, Egypt.

Onion yellow dwarf virus (OYDV) causes mosaic in garlic plants, together with other potyviruses, Carlaviruses and Alexiviruses. An isolate of OYDV producing typical yellow strips was isolated from naturally infected garlic plants by using differential hosts and single local lesion transfer from *Chenopodium amaranticolor* to *Ch. quinoa* and *Ch. album*. The isolate obtained was mechanically transmitted and caused chlorotic local lesions on *Ch. amaranticolor* and necrotic local lesions to *Ch. album*. The virus had narrow host range, restricted mainly to *Allium* spp. and some species of *Chenopodiaceae*. The isolate was easily mechanically transmitted to garlic (9 out of 15 plants), and aphid-transmitted in a non-persistent manner by the aphid *Myzus persicae*. Pinwheels and laminated aggregates of cytoplasmic cylindrical inclusions (CI) were observed in thin sections of infected garlic leaf cells. The virus was purified from OYDV-infected garlic tissues by clarification with Triton X-100, precipitating virus particles by polyethylene glycol and the concentration by three cycles of ultracentrifugation, first on a 20% sucrose cushion, second on a 0-40% cesium chloride, third on a 10-40% sucrose density gradient. Ultraviolet absorption spectrum of the purified virus preparation showed a typical curve of nucleoprotein with A 260/280 ranged from 1.280 to 1.360. The yield of purified virus was 15-20 mg/kg infected leaves. The modal length of the purified virus particles was

750 to 775 x 15 nm and the capsid protein was 35 kDa in size when determined by SDS-PAGE. OYDV-RNA identity was confirmed in the purified virus preparation and infected garlic samples by reverse transcription-polymerase chain reaction (RT-PCR), using two oligonucleotide specific primers to amplify the complete OYDV- coat protein gene with a size length of approximately 288 bp. Polyclonal antibodies against OYDV were produced and the antiserum titer was determined using indirect DAS-ELISA

V 52

PRELIMINARY STUDY ON PEPPER VIRUSES IN SYRIA AND THEIR ABILITY FOR SEED TRANSMISSION. K. Daas¹, H. Kawas² and S. Al-Chaabi¹. (1) General Commission for Scientific Agricultural Research, Douma P.O. Box 113, Damascus, Syria. (2) Agricultural Faculty of Damascus University, Email: gcsarshaabi@mail.sy

A field survey was conducted during 2004-2005 growing Seasons to identify some important viruses affecting pepper (*Capsicum annuum* L.) in major regions of Syria, where it has been traditionally cultivated: Damascus countryside, Daraa, Homs, Tartous and Latakia governorates. Symptoms observation of 60 Surveyed fields showed that virus incidence ranged between 20 and 95% in both Seasons. The highest incidence was recorded in Daraa (48.94%) in the 2004 season. Total of 245 leaf Samples were randomly collected different locations and tested for the presence of *Alfalfa mosaic virus* (AMV), *Cucumber mosaic virus* (CMV), *Tomato spotted wilt virus* (TSWV), *Potato virus Y* (PVY) and *Tobacco mosaic virus* (TMV) by double antibody Sandwich-enzyme linked Immunosorbent assay (DAS-ELISA). Results showed that 37.5% of tested samples were found to be naturally infected with at least one virus. CMV was the most wide-spread (7.34%), followed by AMV (4.9%), TSWV and PVY (3.67%), and TMV (2.44%). Mixed infection with two (9.39%) or three (5.3%) viruses were observed. Three hundred and eight seed samples were collected from fruits and plants exhibiting viral infection symptoms. Testing for seed-borne viruses by tissue-blot immunoassay (TBIA) was carried out on germinated pepper seedlings. Results showed that the average seed transmission rate with CMV was 49%, whereas seed transmission of AMV was not recorded.

V 53

IDENTIFICATION OF ROSE VIRUSES ASSOCIATED WITH MOSAIC DISEASE IN JORDAN. A. Mansour, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: akelman@ju.edu.jo

The study indicated that rose mosaic disease is associated with *Prunus necrotic ring spot virus* (PNRSV) and *Apple mosaic virus* (ApMV) either as a single or mixed infection. PNRSV was the most common virus on landscape roses, nurseries and roses planted under plastic houses for commercial use in the surveyed regions. Rose mosaic associated viruses were detected during spring season when the symptoms were very obvious. The survey revealed the distribution of rose propagating materials in the country done randomly without any regulations. This is the first report of rose viruses in Jordan.

V 54

SURVEY OF CUCUMBER MOSAIC VIRUS ON WILD TOBACCO (*NICOTIANA GLAUCA* GRAHAM) FROM DIFFERENT REGIONS IN WEST LIBYA. Mahjob A. Ejmal¹, Omar M. EL-Sanousi² and Salah S. El-Ammari³. (1) Faculty of Agriculture, University of Al-Tahaddi, Sirte, Libya; (2) Faculty of Agriculture, University of Omar Al-Mukhtar, El-Beida, Libya; (3) Faculty of Agriculture, University of Gariouns, Benghazi. Libya, Email: Omarelsanousi@yahoo.co.uk

Using DAS-ELISA, *Cucumber mosaic virus* (CMV) was identified as the main virus causing mosaic symptoms on *Nicotiana glauca* in 25 samples from five areas (Sirte, Misurata, El-Khoms, Tripoli and EL-Zawia) in Libya. The CMV was found singly in some of the tested samples and with another *Tobamovirus* in most of them. The CMV in this study was successfully transmitted by sap to 19 species and varieties out of 32 tested. Those species were *Gomphrena globosa* L., *Chenopodium amaranticolor* Coste & Regn., *Chenopodium quinoa* Willd., *Citrullus vulgaris* cv. Klondike, *Vicia faba* L., *Capsicum annuum* L. cv. Cayenna, *Nicotiana benthamiana* Domin, *Nicotiana glauca*.R.C.Graham, *Nicotiana glutinosa* L., *Nicotiana tabacum* L. (cvs. Burley 21, Burley gold, Turkish, White Burley, Xanthi and Xanthi-nc), *Petunia hybrida* Vilm. *Physalis floridana* Rydb, *Solanum melongena* L. cv. Black Beauty, and *Solanum nigrum* L.

V 55

ISOLATION AND STUDY OF DIFFERENT ISOLATES OF A TOBAMOVIRUS ON WILD TOBACCO (*NICOTIANA GLAUCA GRAHAM*) IN LIBYA. Mahjob A. Ejmal¹, Omar M. El-Sanousi² and Salah S. El-Ammari³. (1) Faculty of Agriculture, University of Al-Tahaddi, Sirte, Libya; (2) Faculty of Agriculture, Omar Al-Mukhtar University, El-Beida, Libya; (3) Faculty of Agriculture, University of Gariouns, Benghazi. Libya, Email: Omarelsanousi@yahoo.co.uk

Nicotiana glauca commonly shows mosaic symptoms along the coastal region of Libya. To identify the causal virus, 25 samples were randomly collected from five different areas in the western part of the coastal belt region. Using ELISA, one isolate showed the presence of *Tobacco mild green mosaic virus* alone, whereas in several samples this virus was found together with CMV. Symptomology and host range studies supported the identification of TMGMV by ELISA.

V 56

THE EFFECT OF POTATO VIRUS Y, CUCUMBER MOSAIC VIRUS AND MIXED INFECTION ON SOME TOBACCO VARIETIES UNDER LABORATORY CONDITIONS. Maher Masre, Fedaa Chamsin, Taufik Naser and Imad Ismail, General Organization of Tobacco, The Research Section, P.O. Box 3100, Lattakia, Syria, Email: kaisgazal@shufbc.com

A laboratory experiment was conducted to study the effect of *Potato virus Y*, *Cucumber mosaic virus* and mixed infection with both viruses on three tobacco varieties (Tenbak, Berly, Ferginia). Comparison of the sensitivity of tobacco varieties and the effect of viral infection on some morphological aspects of tobacco plants (plant height, number of leaves, weight of root system, leaf area) were studied. Results have shown clearly the effect of viral infection on the sensitivity of tested varieties, and on their morphological features.

V 57

EFFECT OF SOME CHEMICAL AND CULTURAL MANAGEMENT PROGRAMS AND THERE EFFECT ON SEVERITY AND INCIDENCE ON A PHYTOPLASMA DISEASE OF *SESAMUM INDICUM* L. Ayad Abdulwahd Al-Heety and Oadi Najim Al-Hadethy, Department of Plant Protection, Collage of Agriculture, University of Baghdad, Abu-Ghareib, Baghdad, Iraq, Email: Udayal_hadethy@yahoo.com

The results showed the pesticide Actara 0.1 g/l (Thiamethoxam) sprays significantly reduced phyllody disease in *Sesamum indicum* L. following six applications on 4/7, 18/7, 1/8, 14/8, 27/8 and 10/9 during 2001. One spray for each application time, the incidences of phyllody disease obtained was 0.92-1.49% and 5.68% for the treated and control applications, respectively. Repeated sprays with insecticide Dayaznox 60% EC (dayazanon) 4 ml/l, Venvalrat 20% EC (Pyirithrum) 0.4 ml/l and Actara 25 WG (Thiamethoxam) 0.1 g/l for six sprays significantly reduced phyllody incidence in *Sesamum indicum* L. and reached 0.46 and 10.48% for treated and control treatments, respectively. Seed dressing with the pesticide Crusiser 350 FS (Thiamethoxam) at 0.1 ml/100 g seed significantly reduced phyllody incidence in *Sesamum indicum* L. to 1% and 5.89% for treated and control treatment, respectively. No significant differences in disease incidence between the plants at five different sowing dates were observed. However, using maize and sorghum crops as plant barrier around the sesame crop significant reduced the disease incidence to 0.46 and 1.95%, respectively, as compared to the control (without barrier) (5.68%).

V 58

EFFECT OF SOWING DATE ON THE INCIDENCE OF SESAME PHYLLODY DISEASE AND YIELD OF SESAME (*SESAMUM INDICUM* L.) IN WADI HADHRAMOUT, YEMEN. Salem Mohamed AL-Saggaf, Agricultural Research Station, Sieyun, Hadhramout, P.O Box 9041, Yemen, Email: agr.res.seiyun@y.net.ye

The influence of sowing date on the incidence of sesame phyllody disease caused by Mycoplasma like Organisms (MLO) of irrigated sesame cv. local was studied in field experiments at Sieyun agriculture research station in Wadi-Hadhramout. Six sowing dates at 1- month intervals from the 3rd week in February to July 19 were conducted. Sesame phyllody disease incidence was decreased significantly in the early sowings February (19.9%) and March (15.2%) compared with the late sowing dates. The disease incidence

reached 57.7% for April sowing, 86.8% for May, 57.9% for June and 24.5% for July sowing. The highest seed yields was obtained with the early sowing dates and reached 1.8 t/ha for plots sown in March, followed by plots sown in February (1.7 t/ha), whereas plots sown in later months yielded 0.31 – 0.93 t/ha.

Nematodes

N 1

EFFICACY OF CAULIFLOWER LEAF POWDER AGAINST ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA* ON EGGPLANT AND CUCUMBER ROOTS UNDER OPEN FIELDS AND GREEN HOUSE CONDITIONS. Z.A. Stephan, O.K. Ruman, H.B. Dawood and K.H. Tawfeek, Plant Protection Research Center, State Board for Agricultural Research, Abu-Ghraib, Baghdad, Iraq, Email: zuhairstephan@yahoo.com

In a pot experiment under shade house conditions, application of cauliflower leaf powder at the rates 1 and 2 g/kg soil infested with the root-knot nematode, *Meloidogyne javanica*, one week before planting eggplant seedlings, decreased the infection by 97.2 and 99.8%, respectively, 60 days after inoculation, and significantly increased the vegetative and root dry weights compared to plants inoculated with the nematode alone. In a plot experiment, the application of the cauliflower alcohol extracts at the rates 125, 250, 500 and 1000 ppm were less efficient in controlling the nematode, and mortality rate ranged between 15.18 and 63.70%. Results of the infested soil with root-knot nematode in open field at Abu-Ghraib and under green house conditions at Rashidiya during the season 2005, indicated the importance of this pest on cucumber plants, when the rate of infected and dead plants was 94.26 and 94.12%, which caused a significant yield loss. Other results confirmed the efficiency of the cauliflower powder at the rate 4g/m², Furfural at 4cc/m² and the bio-agent fungus *Trichoderma harzianum* (Bicont) at 1 g/m² when applied 7 days before planting in controlling root-knot nematode and significantly increased cucumber yield. Although the yield following the application of the pesticides Vertimec and Carbofuran was significantly higher than those of the control (nematode alone), their efficiency for controlling the nematode was significantly less than the other treatments.

N 2

RESPONSE OF EGGPLANT TO POPULATION DENSITIES OF *MELOIDOGYNE INCOGNITA* AND CELLULAR ALTERATIONS OF THE INFECTED PLANTS. M.M.A. Youssef and A.M. Korayem, Plant Pathology Department, Nematology Laboratory, National Research Center, Dokki, Cairo, Egypt, Email: myoussef_2003@yahoo.com

The relationship between population densities of *Meloidogyne incognita* (root-knot nematode) and yields of eggplant (*Solanum melongena* L.) was evaluated under field conditions. A negative correlation coefficient ($r = -0.72$) was found between number of the galls/plant and yield/plant. Coefficient of determination (r^2) was 0.52. Also, a negative regression existed between number of the galls/plant and yield/plant as regression equation was $Y = 721.9 - 36.1 X$. Cellular alterations of eggplant roots resulted from *M. incognita* infection revealed that second stage juveniles penetrated the roots by a puncturing action of the stylet and inter- and intracellular migration till they reached the stele region where cells were damaged. Hypertrophy and hyperplasia of the surrounding cells led to formation of the giant cells. Evidence of reproduction was shown where eggs in gelatinous-matrix were found on the outer layer of the root. Evidence of development was shown where the second, the third, the fourth juveniles and the adult female stages were found inside the root tissues.

N 3

EFFECT OF ORGANIC AMENDMENTS ON THE POPULATION DYNAMICS OF THE CORN ROOT NEMATODE. M. Al-Masri¹, S. Al-Arabi¹, K. Al-Assas² and M. Jamal¹. (1) General Commission of scientific Agricultural Research, Douma P.O. Box 113, Damascus, Syria, Email: protlib@mail.sy; (2) Damascus University, Faculty of Agriculture, Department of Plant Protection, Damascus, Syria.

This study was carried out to study the effects of organic amendments on the population dynamics of *Heterodera zae* during the 2003 season. Field plots in the two experimental stations 1 Ayar and Al-Mraieh were divided into 64 plots, with 16 treatments and four replicates for each treatment. Organic amendments [olive oil cake, powder residues of corn plants (*Zea mays* L.), powder residues of rapeseed (*Brassica napus* L.) at rates 2.5, 5, 7.5 and 10g/kg soil and animal manure (4ton/h)] were added 21 days before planting. Statistical analyses of soil samples which were taken monthly during the season showed reduction in the average density of parasitic nematode in all treatments compared with the control. In the first location (1 Ayar station), the reduction in the initial density was noticed 40 days after planting, thereafter, the population increased gradually to reach the highest level at harvest. On the other hand, the

population of nonparasitic nematodes increased in all treatments compared with the control which showed moderate density throughout the season and then increased at harvest. In the second location (Al-Mraieh station) the initial population density of plant parasitic nematode decreased sharply three weeks after applying the organic amendments, thereafter it increased gradually to reach the peak at harvest. The population density of nonparasitic nematode increased during the growing season to reach the highest level in September. However, the population density decreased as the plant reached the last growing phase. In the first location, the powder of rapeseed plants residues significantly reduced the population density of parasitic nematode in August and October in comparison with other treatments, whereas, the olive oil cake gave the best result throughout the growing season in the second location.

N 4

OCCURRENCE OF WHITE-TIP NEMATODE, *APHELENCHOIDES BESSEYI* IN CERTAIN RICE CULTIVATIONS AT SOUTH DAKAHLIA GOVERNORATE, EGYPT AND ITS MANAGEMENT UNDER FIELD CONDITIONS. A.G. El-Sherif¹, A.E.M. Khalil², A.F. Refaei¹ and A.H. Nour El-Deen². (1) Nematology Research Unit, Agriculture Zoology Department, Faculty of Agriculture, Mansoura University, Egypt; (2) Plant Pathology Research Institute, Agriculture Research Center, Giza, Egypt, Email: elsherifmohammed@yahoo.com

Examination of the vegetative stage, as well as panicles at harvest (fresh) and seed sample from farmer's store (12 months) of rice cvs. Sakha 101, Sakha 103 and Rehió grown in South Dakahlia fields for *Aphelenchoides besseyi* symptoms on leaves, the whitening of the leaf tip during the vegetative stage, and the shortened, twisted, chlorotic strips along one edge of the leaf at the flowering and harvest stages were observed. Results also indicated that a total of 18.27% of the stored grains and 6.66% of the fresh grains were clearly infested with *A. besseyi*. Moreover, rice cv. Sakha 101 appeared to be the most susceptible to *A. besseyi* with infestation levels reached 22.22 and 7.5% and number of nematodes per 100 seeds 115 and 30 individuals for stored and fresh rice seeds, respectively. Panicles of rice cv. Sakha 101 with white-tip disease symptoms were obviously shorter by 16.08%, lighter by 38.63%, reduction by 53.71% in 100 grains weight, and sterile grains reached 41.53% as compared to panicles without any clear disease symptoms. Number of *A. besseyi* was higher in the diseased panicles than those without apparent disease symptoms, and reached 160 and 15 individuals per 100 seeds, respectively. Length of flag leaf averaged 5.3 cm in plants with disease symptoms. *A. besseyi* management on rice plant cv. Sakha 103 during the rice growing season 2003 with the tested four chemical pesticides as well as the two plant extracts revealed that all tested materials obviously reduced nematode population. Moreover, periwinkle *Vinca rosea* accomplished the highest rate of nematode reduction (55.71%) in shoot, followed by Dimathoate (25.88%), whereas throne apple, gave the least rate of nematode reduction (1.62%) compared with the untreated plots, respectively. Moreover, the bioagent, *V. rosea* achieved the highest rate reduction of nematode population in grains (83.3%) and surpassed all tested compounds in grains weight increase (61.4%) followed by Dimathoate (54.6%).

N 5

EFFECTIVENESS OF SOME NEMATOCIDES TO CONTROL ROOT-KNOT NEMATODE (*MELOIDOGYNE JAVANICA*) ON TOMATO PLANT. Othman Aldakhli¹, Nabil Farhat¹, Yousif nagah². (1) High Algerian Center for Agriculture Technicians, Tripoli, Libya P.O. Box 151, Email: amn_de@yahoo.com; (2) Agriculture Research Center P.O. Box 2480, Tripoli, Libya.

Two nematocides, Furadan (systemic) and Mocap (contact) were evaluated at recommended dose and a higher dose to control root-knot nematode (*Meloidogyne javanica*) on tomato variety Rio Grande under green house conditions. When two furadan concentrations were used to treat soil contaminated with the nematode eggs, improvement in plant growth and decrease in population and reproduction of nematodes and number of galls and egg sacs on the roots were observed. Increase in furadan concentration had no significant effect on growth of plants not treated with nematodes compared to the control at the high dose, it had a negative effect on plant growth.

N 6

COMPARABLE EFFECT OF RAPESEED OIL CAKE AND CERTAIN OTHER TREATMENTS IN CONTROLLING CORN ROOT NEMATODES ON CORN. S. Al-Arabi and M. Al-Masr, Department of Plant Protection, Faculty of Agriculture, General Commission of scientific Agricultural Research, Douma P.O. Box 113, Damascus, Syria, Email: sobhia_alarabi@hotmail.com

Two experiments were conducted in One Ayar and Al-Muryieh Agricultural Research Stations, Damscus Countryside and Dir Al-Zoor Govenorates, respectively, to study the effects of rape-seed oil cake, *Brassica napus* L. (2.5, 5.0, 7.5 and 10 g/Kg soil), cow manure (4 ton/h), NPK fertilizer (6 Kg/acre) and the nematicide ethoprop (10 Granule) (25.2 g/m^2) in controlling corn root nematodes (*Pratylenchus*, *Ditylenchus*, *Helicotylenchus*, *Rotylenchus*, *Longidorus*, *Heterodera*, *Pratylenchoides*, *Tylenchorhynchus*, *Xiphinema*, *Hoplolaimus*, *Tylenchus*, *Hemicyliophora*, *Paratylenchus*, *Macroposthonia*) on corn (*Zea mays* L.). In both experiments, rapeseed oil cake (7.5 g/kg soil) was more effective than the nematicide ethoprop, and reduced ($P \leq 0.05$) nematode population density in soil and roots by 72.7 and 79.8%, respectively. All treatments increased ($P \leq 0.05$) corn growth and productivity, compared to control, but rapeseed oil cake (7.5 g/Kg soil) was the most effective, and increased corn yield by 8.69%.

N 7

GEOGRAPHICAL DISTRIBUTION OF THE CEREAL CYST NEMATODES, *HETERODERA AVENAE* AND *H. LATIPONS* AND THE SUSCEPTIBILITY OF SOME CEREAL CULTIVARS TO INFECTION IN ALGERIA. Aissa Mokabli, Agricultural Department of Zoology, Agronomic National Institute of El-Harrach, Algiers, Email: mokaisa@yahoo.fr

A survey initiated in 1992 showed the presence of two cereal cyst nematode species, namely *Heterodera avenae* and *H. latipons* in Algeria. Spread of infestation varies from one area to another, and the most infested areas are those where crop rotations are dominated by cereals (durum wheat, common wheat, barley, oats) as in Tiaret, Ain Defla, Sétif, Mascara, Sidi Bel Abbots and Chlef. All the tested cereal cultivars showed various degrees of susceptibility to both nematode species. However, wheat cv. Bidi 17 was the most susceptible, and could be used as a favorite host to maintain these nematodes in Algeria.

N 8

RELATIONSHIP BETWEEN THE INITIAL INOCULUM DENSITY OF *MELOIDOGYNE INCOGNITA* AND INFECTION AND REPRODUCTION ON GREEN BEANS. S.N. Nadary, A. S. Al-Hazmi, A.A.M. Dawabah and F.A. Al-Yahya, College of Food and Agriculture Sciences, King Saud University, P.O. Box 2460, Riyadh 1145, Saudi Arabia, Email: nadary3@yahoo.com

A greenhouse pot experiment was conducted to determine the relationship between the initial inoculum density (P_i) of *Meloidogyne incognita* (race 2) and its pathogenicity and reproduction on green beans (*Phaseolus vulgaris*) cv. "contender". Eight densities of P_i were used: zero (control), 1, 2, 4, 8, 16, 32, and 64 eggs/g soil. Results showed a decrease in shoot and root weights, particularly at moderate and high densities of P_i . Weight reduction increased as P_i was increased up to the death of plants at the highest density of P_i (= 64 eggs/g soil). Inoculum density was negatively correlated with shoot ($R^2 = 0.54$) and root ($R^2 = 0.28$) weights. Inoculated plants were heavily galled, even at the lowest P_i . Galls on roots increased as P_i was increased, and P_i was positively correlated ($R^2 = 0.75$) with galls/g root. The nematode reproduced readily on this cultivar. Eggs and egg masses on roots increased as P_i was increased. The reproduction factor (R_f) was highest (91.47) at the lowest P_i , then progressively decreased with P_i . At P_i of 32 eggs/g soil, R_f was less than one ($R_f < 1$). Inoculum density was positively correlated ($R^2 = 0.86$) with egg masses, and negatively correlated ($R^2 = -0.71$) with R_f . This study indicates that cv. "contender" of green beans is susceptible to *M. incognita* (race 2), and very sensitive to this nematode infection at high inoculum densities, as well as a "good host" for the nematode reproduction.

N 9

EFFECT OF UREA AND NPK FERTILIZERS ON THE INFECTION OF WHEAT WITH CEREAL CYST NEMATODE. Ahmad S. Al-Hazmi and Ahmed A. M. Dawabah, Plant Protection Department, College of Food and Agricultural Sciences, King Saud University. P.O. Box 2460, Riyadh 11451, Saudi Arabia, Email: dawabah@hotmail.com.

Two outdoor pot experiments were conducted to evaluate the effects of urea and certain NPK fertilizers on the infection of wheat cv. "Yecora Rojo" with cereal cyst nematode, *Heterodera avenae*. Two naturally infested soils with nematode initial population densities (Pi) of 54 and 27 eggs/g soil were used in the first (exp. 1) and second (exp. 2) experiments, respectively. In each experiment, a complete randomized design with ten treatments and five replications was used. Seven fertilizer treatments, and three control treatments namely; fenamiphos, nematode alone, and an autoclaved field soil were assessed. Plastic pots (16 cm diam.) were filled with the designated soil, and planted with wheat grains. Fertilizers and the nematicide, fenamiphos were added at the recommended time and rates. Wheat seedlings were thinned to three/pot, immediately after germination. Pots were watered as needed, and left in the outdoor without any additional treatments till the end of the experiments. Results showed that fenamiphos was highly effective, suppressing number of white cysts/root system by 95.1 % (exp. 1) and 95.7 % (exp. 2). Urea (600 kg/ha at planting) has also, suppressed ($P < 0.05$) number of white cysts/root system by 69.5 % (exp. 1) and 71.7 % (exp. 2). While, urea (600 kg/ha at three doses) suppressed ($P < 0.05$) number of white cysts/root system by 53.6% (exp.1) and 54.3 % (exp. 2). Other NPK fertilizers suppressed number of white cysts/root system by 32.9 – 52.2 % (exp. 1) and 34.7 – 43.8 % (exp. 2). In each experiment, Fresh and dry weights of wheat shoot and root systems, and number of spikes/plant were relatively the highest ($P < 0.05$) in the autoclaved field soil and the lowest ($P < 0.05$) in the nematode alone treatment. However, fenamiphos and urea (600 kg/ha at planting) increased ($P < 0.05$) the fresh and dry weights of wheat shoot and root systems, and number of spikes/plant compared to the nematode alone treatment.

N 10

SURVEY OF NEMATODE GENERA IN THE POTATO RHIZOSPHERE IN CENTRAL AND SOUTH SYRIA. Anas Altoun, National Plant Protection Co., P.O. Box 603, Douma, Damascus, Syria, Email: anas-altoun@mail.sy

A survey of nematode genera in the potato rhizosphere, was carried-out in 86 potato fields in 40 locations of the major potato producing areas in central and south Syria during 2002-2003. Thirty eight nematode genera were extracted and identified from the soil samples, including: nineteen genera of plant parasitic nematodes, eight bacterial-feeding genera, two fungivores genera, eight omnivores, and one predator genus. Plant parasitic nematode genera consisted 19.9% of the total nematode community in the southern region and 36.3% in the central region. Root-knot nematode, *Meloidogyne* spp., consisted 9.06% of the total plant parasitic nematode community in all the surveyed fields followed by *Tylenchus* (6.37%), *Paratylenchus* (4.85%) and *Tylenchorhynchus* (4.81%). *Mylonchulus* and *Garcilacus* were recorded for the first time in Syria with a very low incidence of 0.007% and 0.005%, respectively. Relative population density, absolute and relative frequency, prominence value and the standard error of sampling were estimated for each genus. *Tylenchus* recorded the highest frequency of occurrence among the plant parasitic genera (70%), followed by *Pratylenchus* (63%), *Ditylenchus* (17%) and *Meloidogyne* (6%). Index of similarity between the central and south regions was 1.17.

N 11

EFFECT OF PREVIOUS CROP ON PLANT PARASITIC NEMATODE COMMUNITY ASSOCIATED WITH POTATO IN CENTRAL AND SOUTH SYRIA. Anas Altoun, National Plant Protection Co., P.O. Box 603, Douma, Damascus, Syria, Email: anas-altoun@mail.sy

Effect of previous crop on plant parasitic nematode community associated with potato in central and south Syria was studied during 2002- 2003, where the effects of wheat or anise and wheat or potato were studied in south and central regions, respectively. Results showed that wheat, as a previous crop increased the population density of *Tylenchus* in the potato rhizosphere in the south region of Syria. However, potato-potato rotation increased the population density of *Tylenchorhynchus* and other plant parasitic nematodes in potato rhizosphere compared to wheat –potato rotation.

N 12

DAMAGE POTENTIAL AND REPRODUCTION OF *HETERODERA AVENAE* ON WHEAT AND BARLEY UNDER TUNISIAN FIELD CONDITIONS. Najoua Namouchi Kachouri¹, Mouhamed Mouldi B'chir² and Arbi Hajji¹. (1) Plant Protection Department, INRAT, 2049 Ariana, Tunisia, Email: kachouri.najoua@iresa.agrinet.tn; (2) INAT, 1082 cité Mahrajène Tunis, Tunisia

The aim of this study was to assess the effect of *H. avenae* initial population densities (Pi) on the yield of wheat "Kareem" and barley "Reehan" cultivars and on nematode reproduction, under Tunisian field conditions. At increasing Pi, *H. avenae* suppressed ($p \leq 0.05$) plant height, number of spikes, number of grains per spike, weight of 1000 kernels and grain yield of wheat and barley were reduced by 19 to 86% for wheat and 26 to 96% for barley. The suppression of these parameters, as well as the final population densities (Pf), increased with increasing of Pi levels. Final population (Pf) was positively correlated with Pi on wheat and barley whereas reproduction factor (Rf) was negatively correlated with Pi on both hosts. The reproduction factor decreased, but was always greater than 1.0.

N 13

DETECTION OF THE SUGAR BEET CYST NEMATODE *HETERODERA SCHACHTII* IN SYRIA. M. Albalkhi¹, F. Farawati¹, Abdel Rahman Katmesh² and Abdel Razzak Al-Nakouh². (1) Nematology Research Division, Plant Protection Department, General Commission of Scientific Agricultural Research (GCSAR), Douma, P.O. Box 113, Damascus, Syria; (2) GCSAR, Al-Ghab, Hama, Syria.

During the period 2002-2005 detection and distribution of *Heterodera schachtii* in sugar beet growing areas in Syria was studied. 346 dry soil samples were taken from fields plowed recently. Cysts were extracted by Fenwick funnel and crushed to estimate number of eggs/g soil. *Heterodera schachtii* was found in two restricted localities in Homs (Alksare) and Gab. The infestation rate was 12.5 and 6.7% of all the tested samples, and the egg averages were 2.5 and 3/g soil, in both locations, respectively.

N 14

A SURVEY OF PLANT PARASITIC NEMATODES ASSOCIATED WITH COTTON IN SYRIA. M. Albalkhi and F. Farawati, Nematology Research Division, Plant Protection Department, General Commission of Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria, Email: manhal1951@yahoo.com

220 soil and roots samples were collected from cotton fields between May 2002 and October 2005. Nematodes were extracted by gravity screening and Baermann funnel and identified to genus. *Meloidogyne* spp. were dominant in Deir Azor, Rakka and Gab. It caused wilting to cotton plants in association with other fungi, i.e., *Rhizoctonia* and *Pythium* and high population (5-200 per 100 ml soil) of juveniles and adult stages was found. In addition, *Pratylenchus* spp. were widespread in Euphrates basin and Aleppo; *Helicotylenchus* and *Tylechorynchus* spp. in most samples and *Rotylenchulus reniformis* in one site in Deir Azor. Examination of root samples under the stereoscope suggested that root knot nematodes and lesion nematodes were dominant in most infested samples with a population density of 280 and 42 nematodes in 10 grams of roots, respectively.

N 15

INTEGRATED NEMATODES CONTROL ON TOMATO AND CUCUMBER PLANTS IN GREENHOUSES ALONG THE SYRIAN COAST. M. Albalkhi and F. Farawati, Nematology Research Division, Plant Protection Department, General Commission of Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria, Email: manhal1951@yahoo.com

Vegetables in greenhouses along the Syrian coast are infected with root-knot nematodes *Meloidogyne* spp., which causes great losses because of monoculture and suitable environmental conditions. Integrated control measures such as chemical pesticides, solarization, organic materials, biological control...etc. were applied in experiments at GCSAR since 1984. Chemical pesticides and solarization using plastic or polyethylene were the most effective, followed by the other control measures. Applying these measures decreased root knot nematodes population and helped in producing safe agricultural products.

N 16

SURVEY OF PLANT PARASITIC NEMATODES AND FUSARIUM WILT ASSOCIATED WITH LENTIL IN SYRIA. Mohammad Farhan Ismail¹, Mohammad Hecham Al-Zainab² and Ahmed El-Ahmed².

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A survey of plant parasitic nematodes and *Fusarium* wilt associated with lentil was conducted at the major lentil growing regions in Aleppo and Idlib provinces during 2001-2003. A total of 777 soil and root samples were collected from 259 fields located in 90 villages during the podding stage. Vermiform nematodes were extracted from soil by Bearmann funnel technique, while cyst nematodes were extracted by Sieving and decanting. Roots were stained with acid fuchsin in lactophenol to distinguish the endoparasitic nematodes. Nematodes were identified to the genus level according to a specialized classification key. Nematode frequency for each genus, and percentage of wilted plants were determined. Wilt causal agent was isolated from plant stems of each sample (2 cm above crown region) on a PDA media, purified, identified and subjected to a pathogenicity test. Results showed that *Heterodera ciceri* was the most encountered nematode in the lentil field soils (86.9%), followed by *Pratylenchus* sp. (50.2%). Infection rate with *Fusarium* wilt reached up to 27.6% and 26.2% in plant samples associated with *H. ciceri* and *Pratylenchus* spp., respectively. Another seven nematode genera were found associated with the lentil rhizosphere soil samples. Rate of wilted plants was also calculated in the positive samples for each nematode genus. Of the total surveyed fields, there were 73.0% infested with nematodes alone, 24.7% with nematodes and wilt, 0.4% with wilt alone and 1.9% were free from nematodes and wilt pathogens. There were positive significant correlations between rate of wilted plants and the pine nematode, *Paratylenchus* spp. ($r = 0.89$) in 2001, and between wilted plants and each of cyst nematode, *H. ciceri*, leaf and bud nematode, *Aphelenchoides* spp. and stem nematode, *Ditylenchus* spp. ($r = 0.72-0.88$) during 2003. The grand mean of wilted plants in the surveyed fields during the two years was significantly higher at Idlib (10.1%) than at Aleppo (6.6%). pathogenicity tests proved that *F. oxysporum* f.sp. *lentis* is the causal agent of *Fusarium* wilt of lentil in the surveyed area.

N 17

APPLICATION OF SOME ORGANIC AND INORGANIC MATERIALS FOR CONTROLLING ROOT-KNOT NEMATODE *MELOIDOGNE JAVANICA* ON EGGPLANT. S.N. Ami and M.A.H.S Al-Sharjabi, Department of Plant Protection. College of Agriculture and Forestry, University of Mosul, Mosul, Iraq, Email: Sulaimanami@yahoo.com

Eight organic and 3 inorganic materials were selected to test their effect on root-Knot nematode *M. javanica* on eggplant. The highest inhibition of egg hatching (83.6%) was caused by powder filtrate of castor bean leaves, while the lowest inhibition (4.67%) was obtained when the eggs were immersed in the filtrate of tri phosphate fertilizer. The highest juveniles mortality (96.2%) appeared when they were immersed in filtrate powder of pepper-mint (horse-mint) leaves, whereas the lowest mortality (1.14%) was caused by the filtrate of tri-superphosphate fertilizer. Application of organic materials to a soil infested with *M. javanica* one week before planting of eggplant seedlings (cultivar Alton Kubri) in green house revealed that the sheep faces was more effective on nematode when added at 4.5% compared to the other animal organic matters. On the other hand, pepper-mint powder was more effective at the same concentration. Compared to the other plant material, the powder leaves of wild radish was the least effective. Organic materials and chemical fertilizer NPK at proper concentration showed variation in their effect on nematode, and didn't negatively effect the growth of healthy plants.

N 18

SURVEY OF NEMATODES AND ENDOMYCORRHIZAL FUNGI OF EGGPLANT IN RURAL AREA OF DAMASCUS. A. Haidar¹, K. Al-Assas² and K. Al-Ashkar². (1) General Commission of Scientific Agricultural Research, Douma, P.O. Box 113, Damascus, Syria, Email: esraaha77@yahoo.com; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, Syria; (2) Department of Plant Science, Faculty of Science, Damascus University, Syria.

Eggplant (*Solanum melongena*) has economic importance in the world and nematodes are considered important pests causing significant losses in production, which may reach 50% *Meloidogyne* spp.

are serious nematode pests which attack crops. Survey of 65 samples collected in 2004 from fields of Eggplant in rural area of Damascus showed that 28 samples (43.07%) are attacked by *Meloidogyne* species. Other plant-parasitic nematodes identified were: *Tylenchorhynchus*, *Pratylenchus*, *Paratylenchus*, *Helicotylenchus*, *Ditylenchus*, *Rotylenchus*, *Longidorus*, *Xiphenema*, *Aphelenchus*, *Aphelenchoides* and *Tylenchus*. Also free-living nematodes such as: *Cephalobus*, *Eucephalobus*, *Panagrolaimus*, *Chiloplacus*, *Rhabdets*, *Rhabdtophora*, *Dorylaimus*, *Eudorylaimus*, *Acrobolus*, *Pelodera*, *Monhystera*, *Mononchus*, *Aporcelaimus* were identified. There are useful fungi at the rhizosphere of Eggplant, the endomycorrhizal fungi, which can improve production and increase plant resistance to some diseases. Testing 84 samples collected from eggplant fields in Rural areas around Damascus in 2004 showed that there were 6 genera of endomycorrhizal fungi, namely *Glomus*, *Gigaspora*, *Acaulospora*, *Endogone*, *Entraphospora* and *Modicella*. *Glomus* detected in 82 samples (97.61%), followed by the genus *Gigaspora* detected in 71 samples (84.52%).

N 19

EFFICACY OF CANOLA OIL CAKE IN CONTROLLING ROOT-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA* IN TOMATO UNDER FIELD CONDOTIONS. Hoda Ameen and Moawad Bondok, Plant Pathology Department, National Research Centre, Dokki, P.O. Box 12311, Giza, Egypt, Email: hoda_ameen@yahoo.co.uk, moawadbondok@yahoo.com

Crop losses inflicted by plant parasitic nematodes are becoming one of the major limiting factors affecting plant growth and yield. Tomato is a highly susceptible crop, especially to the root-knot nematodes, *Meloidogyne* spp. The prolonged and overuse of chemical nematicides caused several hazards. Thus many scientists focused their attention to find safer alternatives. Organic manures, especially plant materials which decompose in the soil producing toxic substances are of great importance. Of these plants, *Brassica* plants are the most valuable, as they contain glucosinolate compounds which break down in the soil to isothiocyanates, which consequently serve as nematicides. Canola (*Brassica napus*) seed meal (4, 6 and 8 tons/feddan) was used as organic amendment incorporated into the soil before planting to evaluate its efficacy in controlling root-knot nematode (*M. incognita*) in tomato cv. "Super strain B", under field conditions. All treatments reduced ($P \leq 0.05$) nematode population in the soil, and number of galls/root. The highest dose (8 tons/feddan) increased tomato yield by 39% compared to the non-amended control.

N 20

CONTROL OF ROO-KNOT NEMATODE, *MELOIDOGYNE INCOGNITA* ON GRAPE BY CERTAIN ORGANIC FERTILIZERS AND BIO-COMPOUNDS. Susan Hasabo¹, Alham Zenhom² and Mohamad El-Shaikh². (1) Plant Pathology Department; (2) Pomology-National Research Centre Dokki, P.O. Box 12311, Giza, Egypt, Email: susan.hasabo@yahoo.com

The efficacy of two organic amendments (cattle and chicken manures), a mineral sulphuric fertilizer and bionema (a commercial product of the bacteria *Bacillus penentrans*) compared to the nematicide carbofuran 10G was evaluated as control measures against root-knot nematode, *M. incognita* on grape cv. "Thompson Seedless" under field conditions. All treatments reduced ($P \leq 0.05$) the nematode populations, especially at the end of experiment (May and June 2004), and increased ($P \leq 0.05$) fruit yield compared to the non-treated check.

N 21

CONTROL OF ROOT-KNOT NEMATODES AND SOIL BORNE DISEASES ON TOMATO BY GRAFTING ONTO RESISTANT OR TOLERANT ROOTSTOCKS. S. Al-Chaabi¹, O. Koutifani¹, M. H. Safeih¹, S. Al-Arabi¹ and J. Asmar². (1) Plant Protection Administration, (2) Scientific Agricultural Research Center of Tartous, GCSAR, Douma, P. O. Box 113, Damascus, Syria, Email: gcsarshaabi@mail.sy

Root-knot nematodes, *Meloidogyne* spp. and soil borne diseases caused severe damages to tomato plants under plastic houses in Tartous province. The compatibility percentages (CPs) between some used rootstocks (Eldorado, He-man, Beaufort and Vigomax) and some common tomato cultivars (Dima, Stella, Gironda, Amal and local) ranged between 84.4 and 100% by using one scion per plant, and between 35.4 and 66.7% by using two scions, whereas CPs of wild tomato rootstock with previous tomato cultivars ranged between 41.7 and 47.9%. The efficiency of grafted cultivars onto imported rootstocks against *M. arenaria*,

M. incognita and *M. javanica* under plastic house fluctuated between 70.9 and 100%, meanwhile the wild rootstock was susceptible. In general, the resistance of those rootstocks decreased as scions number increased per one rootstock. However, infection of check plants with root-knot nematodes decreased after 4 seasons of successive cultivation with grafted plants in the same plastic house. On the other hand, resistance of those rootstocks was broken when grown in *M. hapla*-infested soil. Beaufort, He-man, and Vigomax rootstocks exhibited high levels of resistance against corky root disease (100%), but this resistance decreased when using two scions per one rootstock instead of one. The Eldorado rootstock and the cultivars grafted on it including the Local cultivar were moderately susceptible to corky disease. The increase in productivity of grafted plants ranged between 5.5 and 70.5% for the one scion grafted plants, and between 5.9 and 55.4% for the two scions grafted ones.

N 22

EFFICACY OF SOME METHYL BROMIDE ALTERNATIVES IN CONTROLLING PLANT PARASITIC NEMATODES ASSOCIATED WITH CARNATION IN PLASTIC HOUSES. K.M.Al-Assas, Plant Protection Department, Faculty of Agriculture, Damascus University, Damascus, Syria, Email: khaledalass@hotmail.com

Efficacy of methyle bromide (MB) and two of its alternatives in reducing the populations of plant parasitic nematodes associated with carnation and the subsequent effect on plant growth and flowers yield was investigated in two plastic houses (400 m², each) in Zabadani region. Treatments included; MB (28 g/m²), soil steaming, metham sodium (75 cm³/m²), and non-treated check. All treatments effectively reduced population densities of plant parasitic nematodes compared to the non-treated check. Soil steaming enhanced plant growth and early flowering. But metham sodium gave the highest flower yield. The mean numbers of carnation flowers for the different treatments were 28.3, 23.9, 32.8 and 23.8 (flowers during each harvest day), respectively.

N 23

DAMAGE THRESHOLD OF MELOIDOGYNE INCOGNITA TO TOMATO UNDER DIFFERENT BIOTIC FACTORS. A.M. Korayem and M.M. M. Mohamed, Plant Pathology Department, National Research Centre, El-Tahreer Str., Dokki, Cairo, Egypt, Email: kor_asm@yahoo.com

The relation between population densities of *Meloidogyne incognita* and yield of two susceptible tomato cultivars cv. Super Strain B and Super Marmande was studied under field conditions during 2004 and 2005 seasons. There was a significant negative correlation between tomato yield and the initial nematode density for both cultivars. Also, it was found that low densities of nematodes (10 and 100 nematode per plant) stimulated tomato growth and yield of cv. Super Strain B but not for cv. Super Marmande. The Super Strain B was more tolerant to the nematode infection than the Super Marmande, since the damage threshold level was more than 1600 and 1000 nematode population per plant on the first cultivar, in 2004 and 2005 seasons respectively, whereas it was more than 85 and 65 nematode per plant on the second cultivar in 2004 and 2005 seasons, respectively. The tolerance limit (T) of Super Marmande grown in amended soil with cattle manure was more than that grown in non-amended soil, as T increased from 65 nematodes /plant for tomato grown in non-amended soil to 120 per plant grown in amended soil.

N 24

IDENTIFICATION OF IRANIAN POPULATION OF TWO MAJOR MELOIDOGYNE SPECIES USING MITOCHONDRIAL DNA BASED ON PCR-RFLP. E. Mahdikhani Moghadam¹, A. Kheiri² and M. Mohammadi². (1) Department of Plant Protection, College of Agriculture, Ferdowsi University, Mashhad, P.O. Box 91775-1163, Iran; (2) Department of Plant Protection, College of Agriculture, Tehran University, Karaj, Iran, Email: mahdikhani_e@yahoo.com

Total of DNA was extracted from eggs and second stage juveniles of different Iranian populations of the two most common *Meloidogyne* species in Iran (*M. incognita* and *M. javanica*), using phenol/chloroform method. Following extraction, DNA was electrophoresed on 1% agarose gel to determine its quality and quantity. A specific primer pair (C2F3/1108; 23 and 20 nucleotides, respectively) was used to discriminate *M. javanica* from *M. incognita* populations using polymerase chain reaction (PCR). Primer annealing sites were located in the 3' portion of mitochondrial gene encoding cytochrome oxidase subunit II (COII) and in

the 16S rRNA gene. Following PCR amplification, electrophoresis of amplified DNA showed 1.7 kb fragment in populations of both species. Digestion of 1.7 kb amplified product with *HinfI* restriction endonuclease resulted in the generation of two DNA fragments of 0.7 and 1.0 kb in *M. javanica* and three DNA fragments of 0.3, 0.4 and 1.0 kb in *M. incognita*. There were no differences in digestion pattern among various populations within each species examined. Thus, PCR-RFLP easily differentiated the two species from each other.

N 25

THE USE OF SOLAR ENERGY IN CONTROLLING ROOT-KNOT NEMATODES *MELOIDOGYNE JAVANICA* AND *M. INCOGNITA* AND ITS EFFECT ON GROWTH AND PRODUCTIVITY OF TWO TOMATO VARIETIES IN AL-KUFRA REGION, LIBYA. Idris A. Suliman, Mahmud E. Ehwaeti and Muhmmmed A. Saeed, Plant protection Department, College of Agriculture, Omar Al-Mukhtar University, P.O. Box 919, Al-Beida, Libya, Email: aasa2080@yahoo.com, goody3cot@yahoo.com

A field experiment was carried out to evaluate the use of soil solarization with transparent polyethylene layers to control root-knot nematodes (*Meloidogyne javanica* and *M. incognita*) and its effect on growth and productivity of two tomato varieties Riogrande and Supermarmand in the Al-Kufra region, south-east of Libya. The treatment of soil solarization gave 45 days after placing the plastic cover good result in reducing nematodes population that reached 80% compared with control (without covering). Nematode population at 75 and 120 days after planting reached 70% on Riogrande and 78% on Supermarmand compared with the control. Soil solarization alone had a great effect in decreasing the number of females and eggmasses in the two varieties reaching a mean of about 4.06 and 6.64 compared with the control 14.29 and 7.64 on Riogrande and Supermarmand, respectively. Soil solarization was effective in increasing the growth and productivity of the two tested varieties. The highest yield was in Supermarmand with an average 4.06 Kg/plant and 2.25 kg on Riogrande compared with the control yield of 0.68 and 3.03 kg/plant for the two cultivars, respectively. Soil solarization reduced and eliminated some weeds.

N 26

SOIL BIO-STERILIZATION USING RADISH OIL. Heyiam Ibrahim, Maher Masre and Imad Ismail, General Organization of Tobacco, The Research Section, P.O. Box 3100, Lattakia, Syria, Email: kaisgazal@shufbc.com

Soil bio-sterilization using radish oil (releases mitic gas), local radish, and control (radish free) was conducted during the period 2004-2006. Radish seeds were sown at the rate of 3 g/m². Radish plants, 45 days after sowing or when plant height reached 40 cm. were chopped and buried 30 cm deep in the soil, and then covered with a plastic layer for 10 days. Maryland tobacco seedlings were transplanted in radish and radish free soil after plastic cover was lifted. Nematodes count in planted soils was taken before sowing radish, a month after sowing, after sterilization, and after lifting the plastic cover. Percentage of root infestation with knot nematode at the end of tobacco growing season was recorded. During tobacco growing season fungal diseases and number of weeds were recorded, and a tobacco yield was estimated.

N 27

PLANT PARASITIC NEMATODES ASSOCIATED WITH SOME ORNAMENTAL PLANTS IN TWO CITIES EL-BEIDA AND BENGAZI (LIBYA). Mahmoud E. M. Ehwaeti, Plant Protection Department, Faculty of Agriculture, Omar El-Mukhtar University, El-Beida P.O. Box 191M, Libya, Email: goody3cot@yahoo.com

Ornamental plants are infected by some pests including parasitic nematodes. Because of the economic importance of ornamental plants, a survey to identify the nematodes and their density associated with ornamental plants was carried out. Soil and root samples were collected mainly from the ornamental plants at the depth of 20 to 30 cm. The nematodes were extracted from soil by sieving and Baerman funnel methods, the specimens were killed and fixed by hot solution of FGA 4:1:1 (Formaldehyd: glycerin: acetic acid), processed with anhydrous glycerin by the modified Seinhost method and studied by light microscopy. Results showed that the following plant-parasitic nematode genera were present: *Acrobeles*, *Cephalobus*,

Criconemoides, *Discolaimus*, *Dorylaimus*, *Eudorylaimus*, *Helicotylenchus*, *Hoplolaimus*, *Rhabditis*, *Rotylenchus*, *Pratylenchus*, *Trichodorus*, *Tylenchus*, *Tylenchorhynchus* and *Xiphinema*.

N 28

INCIDENCE OF POTATO DISEASE CAUSE BY LESION NEMATODES *PRATYLENCHUS* SPP. IN WESTERN REGIONS OF LIBYA. Khalifa, H. Dabaj¹, Ayad, A. Haji² and Amhamed Al-Soul. Department of Plant Protection, Faculty of Agriculture, Al-Fateh University, Tripoli, Libya, E-mail: dabajhk@yahoo.com; (2) Agriculture Research Centre, Tripoli, Libya.

Observation of potato tubers from the spring crop stored in pits to be grown during the autumn season has repeatedly shown the presence of small brown sunken lesions which later become extensive covering a large area of the tuber. Microscopic examination of infected tissues revealed the presence of *Pratylenchus* spp. This nematode did not pose a major threat to the potato culture in Libya before. However, the situation had changed lately making the lesion nematode an important pest to spread in all potato growing areas close to Tripoli. Severe infection of the tubers during storage worsened the situation because these tubers are used as potato seeds for the autumn crop. This even led to the nematode being spread to newly reclaimed lands, 400 km away. Soil samples from potato farms in the autumn of 2005, showed a population density of 460 J₂/gm of soil. To contain the wide spread of the potato lesion nematode, local quarantine measures should be imposed.

Weeds

W 1

EFFECT OF CLIMATIC VARIATION ON THE COMPETITIVENESS OF HOLY THISTLE (*SILYBUM MARIANUM* GAERTN.) WITH WHEAT. Muhammad Azim Khan and Khan Bahadar Marwat, Department of Weed Science, NWFP Agricultural University Peshawar, 25130, Pakistan, Email: ahmadzaipk@yahoo.com

There is an increasing interest in weed suppression by crop density. We hypothesized this concept to validate whether competitiveness of the weed, holy thistle (*Silybum marianum* Gaertn) is variable under different environmental condition. This hypothesis was tested by sowing four seed rates of wheat (280, 336, 392 and 448 seeds/m²) in main plots and seven weed densities (0, 3, 6, 9, 12, 15 and 18 plants/m²) in sub-plots, in a split plot design. Randomized complete block design with split plot arrangement was used in the experiments during 2003/2004 and 2004/2005. Increasing seed rate greatly suppressed the weed growth during the first year and had no effect on weed growth in the second year due to higher rainfall and low temperature during the second year which favoured the growth of the weed. With the increasing density of either species, the seed production plant⁻¹ of the weed decreased, but the magnitude of seed reduction was seed rate-, weed density- and year-dependent. There was a strong correlation between rainfall/temperature and weed growth. Mixture (wheat + thistle) intercepted more light in the second year as compared to that during first year which was attributed to larger weed vegetative growth during the second year. Holy thistle proved to be more aggressive in the second year as compared to that in the first year due to favourable environmental conditions for its growth and development. Thus, seed rate and weed density did not give accurate prediction to estimate the yield losses and competitiveness of a particular weed. Hence other factors like rainfall and temperature should also be considered while developing a model. Optimum seed rate (336 seed/m²) of wheat could contribute to a strategy to reduce yield losses and to prevent this weed from seed production for long-term weed management. However this approach can be used as a part of integrated weed management.

W 2

INTERFERENCE OF HOLY THISTLE WITH WHEAT AT DIFFERENT DENSITIES. Muhammad Azim Khan and Khan Bahadar Marwat, Department of Weed Science, NWFP Agricultural University Peshawar-25130, Pakistan, Email: ahmadzaipk@yahoo.com

Field trials were conducted at Peshawar, Pakistan for two crop seasons i.e. 2003/04 and 2004/05 using a randomized complete block (RCB) design with split-plot arrangement. The main plots consisted of four seed rates of wheat (*Triticum aestivum* L.) i.e. 100, 120, 140 and 160 kg/ha⁻¹, while sub-plots had seven densities of the weed, holy thistle (*Silybum marianum* Gaertn.) viz., 0, 3, 6, 9, 12, 15 and 18 plants/m². Holy thistle was more aggressive during second year as compared to first year, mainly due to unusual rainfall (140 and 317 mm in year 1 and 2, respectively), which in return affected the yield and yield related traits in wheat. Crop yield losses with increasing weed density were greater with lowest crop populations. The results of grain yield losses caused by the weed at different densities in two trials indicated that both species caused a density-dependent yield loss which is better explained by weed dry weight. Percent light interception increased with increasing wheat or weed density. However, weed density beyond 6 plants/m² had no significant effect on percent light interception. Higher fresh and dry biomass of wheat was recorded in medium sowing rates (120 and 140 kg/ha⁻¹). As a result, higher fresh and dry biomass of the weed was recorded in low wheat density rather than high seeding density. All of the agronomic characters decreased with increasing the density of either species. Higher values of reproductive and vegetative characters of the weed were recorded in the second year as compared to that in the first year, and highest grain yield was obtained with wheat seeding rate of 120 kg/ha⁻¹. Maximum yield losses at seed rate 100, 120, 140 and 160 kg/ha⁻¹ were 26, 18, 15 and 7%, respectively during first season; and 37, 31, 28 and 29%, respectively during the second season. Weed seed production was related with weed biomass which was dependent on wheat density; the higher the wheat density, the lower was the weed biomass. However, there was still a large seed production even at the highest wheat density. Thus, crop density alone could not suppress the weed below threshold level. The weed reduced wheat yield mainly by the indirect effect of decreasing wheat tillers. The weed density, which resulted in yield losses varied greatly with density and season.

W 3

EGYPTIAN EXPERIENCE IN INTEGRATED WILD OAT MANAGEMENT IN WHEAT FIELDS.

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Wheat in Egypt suffers from troublesome weeds, especially canary grass, wild oats and other broad-leaf weeds, causing severe yield reduction. Recently, an integrated weed management approach was developed to solve this problem through testing various components of prevention, cultural practices, crop rotations and the use of recently recommended herbicides. Socioeconomic condition of the farming communities were also considered in order to generate suitable weed management packages for wheat. Thirty-five field experiments were conducted on research stations during the period from 1992 to 2002. Main findings revealed that integration of planting wheat clean seeds; pre-sowing irrigation once or twice (Herati method) followed by plowing; wheat rotation with clover; chemical control of both grassy and broadleaf weeds and hand weeding twice at 30-60 days after sowing reduced wild oat populations and maximized the potential wheat yield. Fifty three field verification trials were carried out on 230 sites in various districts in 12 governorates to demonstrate the benefits of the integrated management of wild oats to farmers, extension agents and weed control specialists. The results of 950 demonstration fields in heavily infested wheat fields with wild oats during the period from 1992 to 2002 in 14 governorates using wild oat control package, revealed that applying the integrated package reduced wild oat population by over than 90%, and improved wheat yield by 56–68% as compared to fields with normal farmer's practice. The annual application of the integrated package is important to keep the infestation with wild oat under control and to sustain wheat production in Egypt. The ministry of agriculture adopted the application of this package on 20,000 hectares of heavily infested wheat fields with wild oats in 2004/2005 season, and on 40,000 hectares in 2005/2006 season. Socio-economic studies indicated that using the recommended integrated wild oat control package added to the national income about 119 million dollars during the period 1992-2002.

W 4

CONTROL OF LICORICE (*GLYCYRRHIZA GLABRA* L.) IN RAINFED WHEAT FIELDS BY HERBICIDES AT THREE GROWTH STAGES IN IRAN. **M. Veisi**¹ and H. Rahimian². (1) Agricultural Research Center of Kermanshah, P.O. Box 67145-1661, Iran, Email: movassi2002@yahoo.com; (2) Plant Pest and Diseases Research Institute, Tehran, Iran.

Licorice (*Glycyrrhiza glabra* L.) is an important permanent weed in different crops specially rainfed wheat in Iran. In this study interaction between two different systemic herbicides and a combination of them and three growth stages of Licorice was investigated. Experiment was carried out in Mahidasht and Sararood Agricultural Research Stations of Kermanshah during 2002-2004 and randomized complete block design was applied with two factors and four replications during the fallow season. The first factor included the application of: (1) 2-4-D+MCPA at 1.32+2.68 kg.a.i.ha⁻¹, (2) picloram at 0.28 kg.a.i.ha⁻¹, (3) a combination of 2-4-D+MCPA+ picloram at 0.99+2.01+0.14 kg a.i. ha⁻¹ and (4) control without herbicide. The second factor was Licorice phenological stages (20-25 cm height around 6 leaf stage, blooming stage, and podding stage). Plant density in one m² was determined one month after application of herbicides. Licorice control was evaluated in wheat during the following growing season in the rotation, in the sprayed plots. Herbicides were not applied in wheat. Plant number and dry weight of Licorice (PNL&DWL) and wheat yield, were determined before harvest. Results indicated that the best treatment for PNL control was 2-4-D+ MCPA at podding stage, which gave 97.83% control. The best control, judged by PNL was obtained when applied at podding stage followed by blooming stage and the least control was when applications were at 6 leaf stage. Application of 2-4-D+ MCPA had the best control on PNL & DWL in wheat. Wheat yield was increased by 23.2% in comparison with control.

W 5

COMPETITIVE EFFECT OF WILD OAT (*AVENA LOUDVICIANA* L.) ON YIELD AND YIELD COMPONENTS OF TWO WHEAT CULTIVARS. Mohammad Armin¹, Gh. Noormohammadi², E. Zand³, M.A. Baghestani³ and F. Darvish². (1) Islamic Azad University, Sabzevar Branch, Daneshgah St. Sabzevar, IRAN; (2) Scientific and Research Branch, Islamic Azad University of Tehran, Iran; (3) Plant Pest and Disease Institute, Tehran, Iran, Email: moh_armin@yahoo.com, moharmin@iaus.ac.ir

A field experiment was conducted at the Agricultural Experiment Station of the Plant Pest and Disease Institute in Karaj. The aim was to investigate the competitive ability of two wheat cultivars at different wheat and wild oat densities, on the yield and yield components. The experiment was arranged in a factorial experiment with two wheat cultivars (Niknejad and Rooshan). Three plant densities (recommended, recommended + 25% and recommended +50%) and four wild oat densities (0, 25, 50 and 75 plant/m²) with four replications. Results showed that Niknejad (a more competitive cultivar) had more yield than Rooshan (a less competitive cultivar) at the higher plant density due to having more fertile tillers. Increasing plant density caused increased height, number of spike/m², number of seeds/m² and yield. With increasing wild oat density, the rate of yield reduction was enhanced in both wheat cultivars.

W 6

DENSITY AND DISTRIBUTION OF SOME WEED SPECIES IN BARLEY FIELDS OF GREAT MAN-MADE RIVER AGRICULTURE PROJECT, SIRTE- LIBYA. Naser O. El-Shakhy¹ and Mohamed A. Alaib². (1) Botany Department, Faculty of Science, Al-Tahady University, Libya, Email: Wasqi2003@yahoo.com; (2) Faculty of Agriculture, Al-Tahady University, Libya, Email: Adrawi2002@yahoo.co.uk

The goals of this study were to assess density and distribution of weed species growing in barley fields of GMMR agriculture project and to provide quantitative data that could be used to estimate losses due to weeds, and also to attract the attention to the economically important weeds in GMMR agriculture project and to develop methods for their control. The results showed that the most prevailing among 71 species recorded were *Lolium rigidum* (4.96 plant/m²), *Melilotus indicus* (19.29 plant/m²), *Emex spinosus* (5.70 plant/m²), *Cutandia dichotoma* (3.68 plant/m²) and *Bromus rigidus* (3.61 plant/m²). The density of remaining species was less than one plant/m². The results also showed that the weeds with wide distribution in the fields were *Brassica tournefortii*, *Hussonia pinnata*, *Rhaponticum acaule*, *Melilotus indicus*, *Senecio gallicus* and *Lolium rigidum* which were recorded in all studied fields (100%). *Emex spinosus* was recorded in 96% and *Centaurea dimorpha* was recorded in 91% of the studied fields. The distribution of remaining species was between 4.54-86.36% of studied fields.

W 7

GEOGRAPHICAL DISTRIBUTION OF CEREAL WEEDS IN THE HIGH PLAINS OF SETIF. Adel Nadjib Chaker, Mohamed Fenni and Meriem Hani, Laboratoire de Valorisation des Ressources Biologiques, Département de Biologie, Faculté des Sciences, Université Ferhat Abbas, Sétif 19000, Algérie, Email: Chakeran@yahoo.fr

The invasion of wheat and barley crops by weeds is among the major problem of crop production in the world, because of the yield losses caused by these species. In the high plains of Setif, cereals cover nearly 80% of the cultivated area. The distribution of principal weeds in the north east of Algeria was investigated, and three principal zones were covered: the northern (mountainous), the central and the southern zones. The climate of this region is continental semi arid with a hot summer and a cold and rainy winter. A list of 56 species belonging to 21 families were identified. The most important families were Asteraceae, Fabaceae, Poaceae, Brassicaceae and Apiaceae. Charts of distribution for 30 principal species were established. The frequency of these species varied between 20 and 80%. The most frequent species were *Anacyclus clavatus*, *Ranunculus arvensis*, *Papaver rhoeas* and *Calendula arvensis*.

W 8

EFFICIENCY OF SOME HERBICIDES TO CONTROL THE WEED BROMES (*BROMUS SP.*).

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Bromes (*Bromus sp.*), is a common weed which causes serious yield loss in wheat in Algeria. The aim of the present work is to clarify the role of four commercial herbicides ATLANTIS (Mesosulfuron-methyl + Iodosulfuron-methyl-sodium + Mefenpyr-diethyl) applied at the dose of 500 g/ ha at 2-3 leaves stage, ILLOXAN B (Diclofop-methyl + Bromoxynil) applied at 2-6 leaves stage at the dose of 4 l/ha, TOPIK 080 EC (Clodinafop-propargyl) applied at 3-4 leaves stage of cereal at the dose 0.8 l/ha and SUFFIX Double Action (Flamprop-isopropyl + MCPA hormone) applied at the tillering stage at the dose of 6 l/ha, to control this serious weed. Some parameters were evaluated for both the *Bromus sp.* weed and for the crop (bread wheat). The results obtained suggested that the crop yield was severely affected by the presence of bromes. The tested herbicides were not effective in controlling the weed, except Atlantis which gave moderately satisfying results.

W 9

EVALUATION OF YIELD AND YIELD COMPONENTS OF WHEAT CULTIVARS UNDER COMPETITION OF FLIX WEED (*DESCURAINIA SOPHIA (L.) WEBB.*)

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Wheat (*Triticum aestivum L.*) is one of the most important crops for food production and is grown in a wider range than any other crop in the world. Weeds, including flix weed (*Descurainia sophia*), compete with the crop plants for water, soil nutrients and light. Thus the weed decreases yield and yield components. In order to evaluate the yield and yield components of eight wheat cultivars in the presence of flix weed, an experiment was conducted by using a factorial arrangement of treatments in a randomized complete block design with four replications during 2003-2004 growing season in Varamin region in Iran. The wheat cultivars were: Tabasi, Roshan, Karaj 2, Azadi, Niknejad, Mahdavi, Shiraz and Pishtaz. Each cultivar, was planted under weed-infested and weed-free conditions. Flix weed was planted at 100 plant/m². Wheat cultivars were planted at optimum density. Traits such as: grain yield (kg/ha), number of spike/m², number of grain per spike and 1000 grain weight (g) were measured and statistically analyzed. Means comparison were done by Duncan multiple range test at P= 0.05. The results showed significant differences among cultivars in yield and in harvest index (%). Spike/m², number of spike/m² and 1000 grain weight were not significantly different. The results showed that cultivar Niknejad was superior to the other cultivars and had a greater yield, and Roshan was the least competitive cultivar.

W 10

CRITICAL PERIOD FOR WEED CONTROL IN CORN *ZEA MAYS* IN IRAQ.

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The critical period for weed control (CPWC) is the period in the crop growth cycle during which weeds must be controlled to prevent economic yield losses. To determine this period in corn *Zea mays* in Iraq, field trials were carried out during the spring 2004, fall 2004 and spring 2005 growing seasons at the Research Station of the State Board for Agricultural Research in Abu-Ghraib, 30 Km West of Baghdad. A quantitative series of treatments of weed-free periods for 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 weeks from crop plants emergence then weeds left to compete with corn for the rest of the growing season. Based on 5% losses in corn seed yield, which was considered the acceptable loss in seed yield in several previous studies, the critical period for weed control was determined. Results of the three season trials indicated that this period was between the 7th-8th weeks after corn emergence, where corn seeds yield was 3.13 tons/ha for the all-season weed-free plots to 2.95 tons/ha for the plots where weeds were left for 7-8 weeks after corn

emergence. All season weeds competition caused 57.8% reduction in corn seeds yield. The practical implications of this study are that herbicides (pre-emergence residual) or other weed control measures should be used in corn in Iraq to eliminate weeds up to 7-8 weeks after crop emergence to prevent the unacceptable losses in corn seeds yield.

W 11

EFFICIENCY OF RECENT HERBICIDES FOR CONTROLLING WEEDS IN WHEAT FIELDS AND THEIR RESIDUAL EFFECT ON CROPS IN ROTATION. Ali Shaker¹, Bahaa Al-Rahban¹, Akram Baqleh¹, Omran Yousef², Halim Yousef² and Khalil Al-Husien³. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria, Email: gcsarpartect@mail.sy; (2) GCSAR, Scientific Agricultural Research Center in Al Qamishli, Syria; (3) GCSAR, Scientific Agricultural Research Center in Deir Ezzor, Syria.

Experiments were carried out at Scientific Agricultural Research Centers in both Deir Ezzor and Qamashli during the 2002 to 2004 seasons, to evaluate the efficiency of certain new herbicides and to study the residual effect of applied herbicides on subsequent agricultural crops cultivated in the same soil treated with such herbicides during the years 2003 and 2004 by growing sugar beet + cotton and lentil + chickpea following wheat in both Deir Ezzor and Qamashli respectively. Results revealed that all herbicides applied for controlling narrow leaved-weeds were superior to that of non-weeded check at high efficiency ranging between 75.25–100% in Deir Ezzor and 78.78– 99.3% for wild oat (*Avena fatua* and *A. sterilis*) control during the above-mentioned seasons. For controlling *Phalaris paradoxa* and minor all herbicides (Sulfosulfuron, Idosulfuron sodium 30 g/ha + Mesosulfuron methyl 30 g/ha + Mefenpyr dithyl 90 g/ha, Idosulfuron sodium 6 g/ha + Mesosulfuron methyl 30 g/ha + Mefenpyr dithyl 90 g/ha, Clodina-fop 240 g/ha + Cloquintocet 60 g/ha) were superior to Flucarbazon Sodium at 100% efficiency for Sulfosulfuron and 45.89% for Flucarbazon Sodium. To control broad leaved-weeds, all herbicides were efficient and superior to the non-weeded check during these seasons but without no significant differences among them. Efficiency reached 97.62% in Deir Ezzor and 100% in Qamashli. Results showed no toxic symptoms on sugar beet and cotton in Deir Ezzor, while toxic symptoms represented by severe yellowing, plant stunting, appearance of needle-shaped leaves and absence of maturation stage appeared on lentil and chickpea in Qamashli for the herbicides Sulfosulfuron, Idosulfuron sodium 30 g + Mesosulfuron methyl 30 g + Mefenpyr dithyl 90 g, Idosulfuron sodium 6 g + Mesosulfuron methyl 30 g + Mefenpyr dithyl 90 g, Flucarbazon Sodium).

W 12

INTERSPECIFIC COMPETITION OF TALL AND DWARF WHEAT CULTIVARS WITH WILD OATS (*AVENA FATUA* L.). Ijaz Ahamd Khan and Gul Hassan, Department of Weed Science, NWFP Agricultural University, Peshawar, Pakistan, Email: ijazahmadk@hotmail.com

To study the interference of wild oats with various cultivars of wheat, an experiment was conducted at Agricultural Research Farm Malkandher, NWFP Agricultural University, Peshawar during 2004/2005 using randomized complete block design, with four replications. The experiment included 6 wheat cultivars viz. Khattakwal, Ghaznavi-98, Fakhar-e-sarhad, Dera-91, Saleem-2002 and Pirsabak-85. With all cultivars, the wild oat was sown at a constant density of 9 plants m⁻². The data were recording on tillers m⁻², plant height (cm), spike length m⁻², spike length (cm), spikelets spike⁻¹, number of grains per spike, 1000 grain weight (g), tillers of wild oat, seed/wild oat tiller, biological yield (kg ha⁻¹), and grain yield (kg ha⁻¹) was recorded. Most of the parameters were significantly affected by wild oats infestation. Maximum number of tillers 273.5 m⁻², spikes 272.3 m⁻², spikelets 18.00 spike⁻¹, spike length 9.32 cm and grain yield 2638 kg ha⁻¹ were produced by cv. Saleem-2002. Plant height 119.3 cm and biological yield 7137 kg ha⁻¹ were the maximum in cv. Khattakwal. Saleem-2000 and Ghaznavi 98 cv. suppressed the growth of wild oats the most, indicating that plant height was not the only indicator of aggressivity among the wheat cultivars.

W 13

EFFECT OF WILD OATS (*AVENA FATUA*) DENSITIES ON YIELD AND YIELD COMPONENTS OF WHEAT UNDER IRRIGATED CONDITIONS OF PESHAWAR. Gul Hassan and Ijaz Ahamd Khan, Department of Weed Science, NWFP Agricultural University, Peshawar, Pakistan, Email: hassanpk_2000pk@yahoo.com

In order to study the yield and yield components of wheat affected by wild oats (*Avena fatua*) densities under irrigated conditions of Peshawar, one field trial was conducted at Malkandher, Research Farm, NWFP Agricultural University in Peshawar during 2004/2005. The experiment was laid out in a randomized complete block (RCB) design with split plot arrangement. Four seed rates viz. 100, 130, 160 and 190 kg ha⁻¹ was assigned to main plots, while wild oat densities of 0, 5, 10, 15, 20, 25 and 30 seeds m⁻² were kept in sub-plots. Data on number of spikes m⁻², spike length (cm), grains spike⁻¹, 1000 grain weight (g), and grain yield (kg ha⁻¹) was recorded. Statistical analysis showed that most of the parameters were statistically affected by wild oat densities and seed rates. Maximum number of spikes m⁻² (281.9), spike length (9.33cm), number of grains spike⁻¹ (50.0), 1000-grain weight (30.26) were recorded in wheat monoculture (0 wild oat density plot). Seed rate of 160 kg ha⁻¹ had significantly higher spikes m⁻² (283.4), spike length (8.58 cm), 1000-grain weight (30.87 g) and grain yield. Thus a seed rate of 160 kg ha⁻¹ is recommended for suppression of wild oats population in wheat crop.

W 14

CONTROL OF DODDER (*CUSCUTA CAMPESTRIS* YUNK.) GROWN ON ALFALFA BY HERBICIDES AND SOME PLANT EXTRACTS. Bakir A. Al-Juboory and Ali F. Al-Mohamadi, Field Crops Department, College of Agriculture, University of Baghdad, Abu-Ghraib, Baghdad, Iraq, Email: wisam_ali2004@yahoo.com

This research was conducted for two seasons, at the field of Agriculture College, Abu-Ghraib, Iraq. The goals were to study the effect of the extracts of some Iraqi noxious weeds, some local chemicals, and their interaction on dodder (*Cuscuta campestris* Yunk.) grown on alfalfa (*Medicago sativa* L.). The results obtained showed that the extracts of johnsongrass (*Sorghum halepense* L.), common reed (*Phragmites communis* L.), and cogongrass (*Imperata cylindrical* L.) had the highest herbicidal effect on dodder. The treatments of the mixture gas oil +10% engine oil, alone or combined with the weed extracts caused the highest degree of killing on dodder plant. Most treatments caused significant positive effect on alfalfa growth, 45 days after treatment.

W 15

CHEMICAL CONTROL OF *OROBANCHE CRENATA* FORSK. ON PEAS. Saffour Kaddour¹, Mohamed Oammou² and Abdelouahed Maataoui³. (1) Centre Régional de la Recherche Agronomique de Marrakech, BP: 533-Gueliz Marrakech, Morocco, Email: ksaffour@yahoo.fr; (2) Centre Régional de la Recherche Agronomique de Meknès ; (3) Ecole Nationale d'Agriculture S/ 14 Meknès, Morocco.

Pea crops occupy yearly an average of 25% (87 000 ha) of the legumes crop area in Morocco. Orobanche (*O. crenata*) is one of the most important constraints of this crop's development. In fields with heavy infestation, yield reduction may reach 100%. The present work was carried out to study the efficiency of herbicides in the control of this parasite on beans (variety: Douce de Provence). The following treatments were used at orobanche tubercle attachment (OTA) and two weeks later: (i) glyphosate at the rates of 60 and 40 g a.i/ha; (ii) sulfosate at 80 and 100 g a.i/ha, imazapic at 5 g a.i/ha. Imazapic was also used only at OTA at 10 g.a.i/ha and a control without treatment. These treatments were used during 2004/05 crop season at Douyet research station (Morocco) which is naturally infested by *O. crenata*. Except for the treatment imazapic at 10 g a.i/ha which was less efficient, all herbicides significantly reduced orobanche shoots by 84 to 98% and orobanche dry matter by 73 to 97%. Phytotoxicity varied from 0 to 2.2 in a scale of 0-9, where 0 indicated no phytotoxicity and 9 when the plant is killed. Yield was also significantly increased by 67 to 114%, compared to the control.

W 16

INDICATIONS FOR TOLERANCE TO OROBANCHE AMONG WILD LENTIL POPULATIONS FROM JORDAN. Barakat Abu Irmaileh¹ and Nasri Haddad². (1) Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: barakat@ju.edu.jo; (2) Department of Horticulture and Crop Science, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: nhaddad@ju.edu.jo

Twenty four lentil lines collected from Jordan and two cultivated lines were tested for their susceptibility to Orobanche infestation in a pot experiment in the greenhouse. Equal weights of four different *Orobanche* species; *O. aegyptiaca*, *O. crenata*, *O. cernua*, and *O. ramosa* were thoroughly mixed in a Jar. From this mix, 1 g of Orobanche seeds were mixed in 1 liter peat moss per experimental pot. Each replicate consisted of one pot in which two lentil seeds were planted. Number of replicates per line varied from 8 to 16. The data on the dry weight of lentil roots and shoots, total number of Orobanche attachments, and the dry weights of Orobanche, were analyzed. Tolerance level was estimated with respect to the average total number of Orobanche attachment per plant according to the following index: average total number of Orobanche attachments +SE/plant 0.1-1 is considered highly tolerant, 1.1-2 is tolerant, 2.1-3 is susceptible and above 3 is very susceptible. The results indicated that none of the lines were very tolerant, the cultivated lines Jordan 1 and Jordan 2 were the most susceptible to Orobanche infestation; lines UJ5, UJ6 and UJ24 were tolerant; lines UJ3, UJ 4, UJ 7, UJ 9, UJ 11, UJ 12, UJ 14, and UJ 19 were susceptible, but the rest of lines were very susceptible to Orobanche infestation. The total number of attachments correlated positively with the average dry weights of lentil roots and shoots ($r= 0.848$ and 0.76 , respectively). The results indicated that there was potential tolerance to Orobanche in wild lentil lines, but further investigation is necessary to verify such results.

W 17

A STUDY OF BRANCHED BROOMRAPE (*OROBANCHE RAMOSAL*) ALONG THE SYRIAN COAST: DISTRIBUTION, HOST PLANTS AND POTENTIAL ROLE OF *PHYTOMYZA OROBANCHIA* KALT. IN BIOLOGICAL CONTROL. Hanan Habak¹, Mohammad Ahamad² and Bahaa Alrahban³. (1) Agricultural Research Center, Lattakia, General Commission of Agricultural Scientific Research, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria; (3) General Commission of Agricultural Scientific Research, Douma, Damascus, Syria, Email: ensafakel@hotmail.com

A survey of many fields and greenhouses along the Syrian coast was conducted during 2002/2003, 2003/2004 and 2004/2005 growing seasons, in order to determine the distribution of branched broomrape (*Orobanche ramosae*), its host plants and the phytophagous insects. *Orobanche ramosa* plant samples were randomly collected from infested fields and greenhouses. These samples were inspected by dissection of shoots and fruit capsules of *O. ramosa* plants and phytophagous insects were collected from them. The total number of inspected capsules and shoots were 4537 and 526; respectively. Results of this study showed that *O. ramosa* is distributed in several sites along the Syrian coast up to a 1500 meters elevation above sea level. Its distribution covered many locations in Gabla (Al Burgan, Hmaemem, Ras Alain and in Ain Al-wadi) and in Tartous (Yahmour, Al-kadmous and in Dreikeish). It was found parasitizing ten plant species of different families as tomato (*Lycopersicon esculentum* Mill), eggplant (*Solanum melongena* L.), tobacco (*Nicotiana tabacum* L.), cucumber (*Cucumis sativus* L.), faba bean (*Vicia faba* L.) and on two species of ornamental plants. The results indicated the distribution and natural occurrence of *Phytomyza orobanchia* Kalt. in most of the infested locations studied on tomato under greenhouses with different infestation rates on *O. ramosa* shoots (6.6-100%), and fruit capsules (0.0-98.5%).

W 18

DELETERIOUS AND PLANT GROWTH PROMOTING RHIZOBACTERIA: A NEW OPTION IN *OROBANCHE* MANAGEMENT. Nadjia Zermane¹, Thouraya Souissi² and Jürgen Kroschel³. (1) Département de Botanique, Institut National Agronomique (INA), 1 Avenue Hassan-Badi, El-Harrach 16200, Alger, Algérie, Email: n.zermane@ina.dz; (2) Laboratoire de Botanique, Institut National Agronomique de Tunis (INAT), 43 Avenue Charles Nicolle, 1082 Tunis-Mahrajene, Tunisie; (3) Integrated Crop Management Division, International Potato Center (CIP), Av. La Molina 1895, apartado 1558, Lima 12, Peru.

Bacteria associated with faba bean *Orobanche* rhizosphere were isolated, and 337 strains were evaluated for their antagonistic potential towards *O. crenata* and *O. foetida* under controlled conditions. Upon preliminary screen using *Lactuca sativa* L. seedlings bioassay, 37 rhizobacterial isolates showing growth inhibitory effect (characterized as Deleterious Rhizobacteria, DRB) and 18 isolates with growth stimulatory activity (characterized as Plant Growth Promoting Rhizobacteria, PGPR) were selected. DRB strains were further screened in root chambers and 70% and 84% of them showed a significant suppressive activity on the pre-emergence of *O. foetida* and *O. crenata*, respectively. Among five bacterial isolates selected for pot trials, strain Bf7-9 of *Pseudomonas fluorescens* was the most suppressive one for both *Orobanche* species. The bacterium reduced shoot emergence of *O. crenata* and *O. foetida* by 63% and 76% and their dry weight by 39 % and 63%, respectively, compared with non-inoculated controls. *Pseudomonas marginalis* strains Nc1-2 and Bzf9-1 ranked second in their efficacy against *O. crenata* and *O. foetida*, respectively. Application of the five rhizobacterial isolates during the preconditioning phase resulted in up to 84% reduction of germination of *O. crenata* seeds. PGPR isolates were evaluated for their ability to induce and/or enhance the germination of *O. crenata* seeds. Ten out of the 15 isolates assayed increased the stimulating effect of lentil root exudates resulting in an up to 43% increase of *Orobanche* seed germination after treatment with *Ralstonia pickettii* strain Bzc76 over the non-inoculated control. However, none of the isolates had a germination inducing effect in the absence of the root exudates. Bzc76 not only enhanced germination of *O. crenata* seeds but also significantly increased the distance of enhance *Orobanche* seed germination by 48%. In pot experiments, application of the bacterium as preplant treatments in association with Egyptian clover (*Trifolium alexandrinum* L.) significantly decreased shoot emergence and dry weight of *O. crenata* by 80% and 70%, respectively, compared to the control with *Orobanche* only.

W 19

INSECTS THAT ATTACK BROOMRAPE, *OROBANCHE* SPP. IN SWEIDA, SYRIA. Wa'el Almatni, Division of Pest Management, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, Email: almatni@scs-net.org

A field study of the insects that attack *Orobanche* spp. in Sweida governorate was carried out during the period 2002 - 2006. Eighteen insect species were recorded to attack *Orobanche*, are polyphagous and most of them attack economic crops. The *Orobanche* weevil *Smicronyx* sp. near *fulvipes* (Coleoptera: Curculionidae) was an exception, which caused the highest damage on *Orobanche* and killed the infested *Orobanche* plants in most cases in the study area. Some insect species were associated with their natural enemies, making an insect complex fauna on *Orobanche* plants.

W 20

CHEMICAL CONTROL OF *OROBANCHE CRENATA* AND *O. AEGYPTIACA* ON LENTIL. Bahaa Al-Rahban¹, Na'im Al Husein² and Fadi Obeid³. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR). Doma, P.O. Box 113, Damascus, Syria, Email: gcsarpartect@mail.sy; (2) GCSAR, Scientific Agricultural Research Center in Aleppo, Aleppo- Syria; (3) GCSAR, Scientific Agricultural Research Center in Idleb, Idleb, Syria.

Orobanche is a parasitic weed that infests a large number of crops especially lentil causing severe economic losses. To reduce its damage, chemical control experiment was conducted by the application of Imazapic at different concentrations (2.5-10 g a.i /ha) in Idleb and Tel-Hadya during the 2000-2002 seasons. The application of this herbicide led to 84.0% and 86.0% *Orobanche* control in Idleb and Tel-Hhadya, respectively, and lentil seed yield was doubled at both locations.

W 21

FIRST RECORD OF *OROBANCHE FOETIDA* POIRET ON CHICKPEA IN MOROCCO. Saffour Kaddour, Centre Régional de la Recherche Agronomique de Marrakech, BP 533, Gueliz Marrakech, Morocco, Email: ksaffour@yahoo.fr

Orobancha (*Orobancha* sp.) is a harmful obligate root parasite of many dicotyledonous crops. It attacks food and fodder legumes in the families, Solanaceae, Apiaceae and Asteraceae. Its infestation is spreading every year to new areas that were not infested before in Morocco. To estimate food legume (faba bean, lentil, peas, and chick pea) crops infestation by this parasite, a survey was conducted on May 2002 in the north part of Morocco region. Results suggested that 80, 75, 90 and 54.5% of faba bean, lentil, peas and chickpea fields, respectively, were infested mainly by *Orobancha crenata*. *O. ramosa* was found only in a faba bean field. *O. foetida* Poiret, which was known previously to parasitize weeds (*Scorpiurus* spp. and *Medicago* spp.) in many regions of Morocco (Saïa, Sidi kacem, Souk larbaa and Taounate), it was found for the first time in this survey that this *Orobancha* species parasitized some chickpea plants in Sidi Kacem province. However, the infestation was still very well low. This species is very established in Tunisia on chickpea and faba beans, where it significantly reduces production.

W 22

MORPHOLOGICAL CHARACTERISTICS OF SOME CEREALS WEED SEEDS. Mohamed Fenni, Adel Nadjib Chaker and Meriem Hani, Laboratoire de Valorisation des Ressources Biologiques, Département de Biologie, Faculté des Sciences, Université Ferhat Abbas, Sétif 19000, Algérie, Email: Fennimodz@yahoo.fr

Cereals including wheat are regarded as the principal food source for man. Weeds reduce the yield of these crops from 20 to 50 %. In spite of their harmful effects and the importance of cereal crops in Algeria, limited studies were conducted on weeds. Morphological study of weed seeds has a scientific and economic importance. Using a A.F.C. and H.C.A, we analyzed. 79 important morphological characters: form (F), color (C), volume (V), brightness (B), roughness (S), hardness (D), length (L), width (LG), diameter (DM) and weight of 1000 seeds. The results obtained enabled us to set up small groups of seeds that resemble each other on morphological basis and to determine the specific characteristics which enable us to differentiate seeds of each species, and use if necessary, other characteristics such as germination.

W 23

SEED GERMINATION OF *ASPHODELUS TENUIFOLIUS* BIOTYPES AS INFLUENCED BY TEMPERATURE AND DORMANCY BREAKING CHEMICALS. Muhammad Ishfaq Khan, Gul Hassan, Shahida Bibi and Imtiaz Khan, Department of Weed Science, NWFP Agricultural University Peshawar, Pakistan, 25000, Email: myboldimage@yahoo.ca

Dormancy is of adaptive significance which enables weeds to persist in the agro-ecosystems. Laboratory studies on dormant asphodel (*Asphodelus tenuifolius*) seeds were undertaken at North West Frontier Province (NWFP). Agricultural University Peshawar, Pakistan, to investigate treatments for breaking seed dormancy such as GA₃, KNO₃, thiourea and sodium azide at 0 to 800 ppm. Seeds were exposed to 10, 20 and 30°C temperature regimes. The experiment was laid out in a completely randomized design with a split-split-split plot arrangement. Temperatures were assigned to main plots, biotypes to sub-plots, while chemicals to sub-sub plots and the concentrations were assigned to sub-sub-sub plots. Each sub-sub-sub-plot comprised of single Petri-dish planted with 20 seeds of asphodel. The germination percentage data were subjected to ANOVA and the means were separated by LSD test. The data revealed that temperatures, biotypes, chemicals, concentrations and their interactions affected germination. The highest (47.41%) germination was recorded at 20°C in all biotypes, while only 1.09% germination was recorded at 30°C. Mianwali biotypes germinated the most (40.83%) as compared to 24.38 and 22.88% germination in Karak and Bhakkar biotypes, respectively. Mianwali seeds had the highest germination (69.13%) when exposed to 20°C. The highest 62.25 and 58.0 germination was recorded in KNO₃ and thiourea in all biotypes. The temperature effect over-ruled the chemicals or biotype effects. Further studies are suggested to confirm the instant findings.

W 24

EFFECT OF SEED BURIAL DEPTH ON THE OCCURRENCE OF WEED SPECIES IN THE SUBSEQUENT CROPS. Nada Al-barni¹, Gassan Ibrahim² and Anwar Al-Mouemar². (1) General Commission for Scientific Agricultural Research (GCSAR), Administration of Plant Protection, P.O. Box 113, Damascus, Syria, Email: albarinada@hotmail.com; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, P.O. Box 30621, Syria.

Seed bank dynamics in the soil were investigated at two different locations during 1999 and 2001. Soil samples were taken from two layers, 0-20 and 20-40 cm, using a manual auger. Weed seeds were separated from the soil samples by flotation methods and then classified. The species and numbers of seeds which form the soil seed bank were obtained. Results showed that less seeds were found in the deeper layer 20-40 cm. Most of the seedlings that appeared with subsequent crops germinated from seeds present in the upper layer 0-20 cm and those seeds were subjected to frequent changes at every soil agitation. Seed germination is related to buried depth, and the seeds in the upper layer germinate more readily. Seeds move between soil layers during cultivation. Different formulas to explain the shift of seeds in soil can be suggested. The formulas may simplify choosing the best control method and proper herbicide to control the possible weed species that might appear. Also studying the dynamics of the weed seed bank movement in the soil can help in determining the flora present in the field and monitoring the infestation with different weed species.

W 25

EFFECT OF WEED CONTROL TREATMENTS AND TRANSPLANTING DATE ON YIELD AND BIO-CHEMICAL COMPONENTS OF ONION CROP. Hassan Salem¹, Abdel Kader Abdel Samad¹, Hashem Ibrahim² and Ibrahim El-Akhal². (1) Faculty of Agriculture, Cairo University, Cairo, Egypt; (2) Weed Research Central Laboratory, ARC, Giza, Egypt, Email: weedrcl@hotmail.com

Onion (*Allium cepa*) is the third most important vegetable crop produced in Egypt. It is a slow growing, shallow-rooted crop that can suffer yield losses from weed competition. One experiment was conducted by using a split plot design during 2001 and 2002 winter seasons. Weed control treatments (as sub plots) included the application of the following herbicides: oxyfluorfen (Goal at 1.87 L/ha), pendimethalin (Stomp at 4.25 L/ha), oxadiargyl (Topstar at 0.75 kg/ha), oxydiazon (Ronstar at 5.0 L/ha); and hand hoeing twice. Unweeded plots were included as a check treatment. The weed control treatments were applied on two transplanting dates: 5 and 20 January, assigned for the main plots. Goal application on 5 January brought about 51% increase in onion yield over that of the un-weeded treatment. Concerning bulb content of NPK, Goal increased nitrogen and potassium content of onion bulbs by 16.3 and 57.7% respectively, 90 days after transplanting. Topstar application on 5 January increased both dry matter and phosphorus content of onion bulb. However, Topstar application on 20 January significantly increased total soluble solids, total soluble sugars and total carbohydrates. Stomp application on 20 January caused the highest increase in protein content.

W 26

IMPACT OF INVASIVE WEEDS ON BIODIVERSITY AND THEIR MANAGEMENT IN PAKISTAN. Khan Bahadar Marwat and Saima Hashim, Faculty of Crop Protection Sciences, NWFP Agricultural University, Peshawar 25130, Pakistan, Email: kbmarwat@yahoo.com

Biodiversity in Pakistan is rich as the country is characterized by diverse climates. Pakistan lies at variable altitudinal and latitudinal gradients. In the South, the altitude from sea level is less than 100 m, whereas in the north it reaches up to snowline. However, biodiversity has been under tremendous pressure of various sources, namely; the temporary settlements of Afghan refugees who are accompanied by the grazing livestock for more than two decades, natural calamities, such as drought, earthquakes and war in Afghanistan. These pressures resulted in changes at the microclimatic level at least in the North Western part of Pakistan. The indiscriminate use of herbicides has also resulted in evolution of new ecotypes. These elements have paved way for weed invasion as the local biodiversity has been altered. Some of the prominent invasive weeds are *Xanthium strumarium*, *Ipomoea eriocarpa*, *Alternanthera pungens*, *Trianthema portulacastrum*, *Tagetes minuta*, *Imperata cylindrica*, *Amaranthus hybridus*, *Robinia pseudoacacia*, *Broussonetia papyrifera*, *Ailanthus altissima*, *Prosopis juliflora*, *Pistia stratiotes*, *Phragmites*

australis, *Parthenium hysterophorus*, *Cannabis sativa*, *Galium aparine* and *Emex spinosus*. Among these invasive plants, *Robinia pseudo-acacia*, *Broussonetia papyrifera*, *Ailanthus altissima* and *Prosopis juliflora* were purposely introduced as forest trees and became invasive with time. This study thus addresses the status and history of weed invasion, future threats to biodiversity and management strategies need to be followed.

W 27

CHEMICAL CONTROL OF WEEDS IN CAULIFLOWER (*BRASSICA OLERACEA* VAR. *BOTRYTIS*) FIELDS IN THE JORDAN VALLEY. Jamal R. Qasem, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: jrqasem@ju.edu.jo

Two field experiments were carried out to evaluate the effect of different herbicides on weeds and cauliflower (*Brassica oleracea* var. *Botrytis* cv. White Cloud) grown under the Jordan Valley conditions during the 1996/1997 and 1997/1998 growing seasons. Most common weed species were *Chenopodium murale* L. (133 plants m⁻²), *Malva sylvestris* L. (38 plants m⁻²) and *Echinochloa colonum* (L.) Link. (15 plants m⁻²). On average, weed competition for the entire growing season reduced crop shoot dry weight by 74.8% and flowering head weight by 77.3% as compared to the weed-free control. With the exception of linuron, all herbicide treatments increased cauliflower shoot fresh and dry weights, head weight and number compared with the weed-infested plots for the whole growing season. However, pre-planting application of oxyfluorfen at 2.5 l ha⁻¹ resulted in the highest cauliflower shoot growth and head weight and was higher than that of the weed-free control. Pre-planting application of DCPA (10 kg ha⁻¹), pendimethalin (4.6 lha⁻¹) and nitrofen (1.4 lha⁻¹) and oxyfluorfen (post-planting) were also effective and resulted in higher head yield of cauliflower compared with other herbicides. Oxyfluorfen (pre-planting) was the best in controlling weeds and reduced weed shoot dry weight by 65.5% of the weed infested control. Other herbicide treatments reduced weed biomass below the weed-infested control but clearly varied in their effects. Although certain herbicides such as diphenamid (7.5 kgha⁻¹) and pronamide (2.5 kgha⁻¹) reduced weed growth compared with the weed-infested control but this was hardly reflected as an increase in shoot dry weight or cauliflower head yield. Among all herbicides, linuron (1.7 kgha⁻¹) was phytotoxic to cauliflower and reduced both shoot growth and head yield although the herbicide halved weed biomass production.

W 28

WEED CONTROL EFFECTS ON DRY MATER ACCUMULATION AND ELEMENTS UPTAKE BY TOMATO AND THEIR ASSOCIATED WEEDS. Abbas A. Bawazir and Ali M. Al-Gunaid, Nasser's Faculty of Agricultural Sciences, University of Aden, Yemen, Email: abbawazir@hotmail.com

Two field experiments were carried out during 1998/99 and 1999/2000 seasons at Nasser's Faculty of Agricultural Sciences Farm, to evaluate the effectiveness of weed control on dry matter (DM) accumulation and elements uptake by tomato and their associated weeds, 60 days after transplanting. Four different applications of Metribuzin and Pendimethalin were used (each used in amount of 0.5 kg a. i. /ha), hand hoeing (25 and 45 days after transplanting) and weedy check. The results showed that all herbicidal treatments and hoeing significantly decreased the nutrient accumulation (DM and amounts of mineral elements N, P, K, Ca and Mg) by weeds, and showed an increased nutrient accumulation by tomato, compared with weedy check. The highest reduction was obtained by using of Metribuzin and Pendimethalin pre-transplanting + Metribuzin- 30 day after transplanting, which led to a reduction in DM accumulation in weeds at the rate of 99.4 and 96.9%, and in amounts of mineral elements (N – 98.6 and 95.5%, P – 98.0 and 93.2%, K – 99.1 and 96.6%, Ca – 99.3 and 96.4%, Mg – 98.6 and 95.8%) of weeds in both seasons, respectively. The same treatment gave highest nutrient accumulation by tomato, with an increase in DM accumulation of 138.0 and 93.8%, N – 217.9 and 159.0%, P – 173.0 and 122.2%, K – 173.3 and 122.4%, Ca- 139.4 and 95.1%, Mg – 165.5 and 116.4%, respectively, in both seasons compared with the weedy check.

W 29

EFFECT OF THE INTERACTION OF SOME HERBICIDES RATE AND DATE OF APPLICATION ON COTTON YIELD AND ITS WEEDS. Dallia S. Al-Kutubi¹, Shakir M. Salih² and Ramadan A. Iltai². (1) Field Crops Department, College of Agriculture, University of Baghdad, Iraq; (2) Field Crops Department, College of Agriculture, University of Tikrit, Iraq, Email: wisam_ali2004@yahoo.com

This field experiment was conducted north of Tikrit to study the effect of the herbicide Focus Ultra (Cycloxydim), at the rate of 2.00 and 3.00 l/ha, Fusilade super (Fluazifop-butyl), at the rate of 0.75 and 1.50 l/ha and Gallant super (Haloxypop-r-methyl ester), at the rate of 0.75 and 1.50 l/ha, with two dates of application (7 and 10 days after sowing cotton, and their effect on cotton yield and its weeds. Results obtained indicated that the herbicides used had a significant effect on weeds and consequently on cotton yield.

W 30

SEED GERMINATION AND SEEDLING EMERGENCE OF THE WEED *SORGHUM HALEPENSE* L IN RELATION TO THE POSITION OF SEEDS IN INFLORESCENCE AND TIME OF SEED MATURITY. A. M. Sultan and S.H. Anter, Field crops Department, College of Agriculture and Forestry Mosul University, Mosul, Iraq, Email: ahsultan2006@yahoo.com

A pot experiment was carried out at College of Agriculture and Forestry - Mosul University during the 2003 growing season, to determine the rate of germination and seedling emergence of *Sorghum halepense* L. Mature seeds developed at different positions in the inflorescence of mother plant at different times were collected in July, August, September and October from either the lower or the upper part of the inflorescence. Data was subjected to the conventional analysis of Complete Randomized Design (CRD) as a factorial experiment. Results indicated that the germination rate was significantly reduced to 63.1 % in seeds matured during October compared with the seeds matured in July. On the other hand, seeds that were collected from the lower part of inflorescence were less viable than those of the upper part. Dry weight of emerging seedlings from seeds matured in September was reduced by 35.7 % compared to those which matured in August. Dry weight of seedlings developed from seeds collected from the lower part of the inflorescence was 18.6% less than those which developed from seeds taken from the upper part of the inflorescence.

W 31

THE EFFECT OF CERTAIN HERBICIDES ON WEED CONTROL AND POTATO YIELD IN SYRIA. Mouzahem Al-Dahoul¹, Bahaa Alrahban² and Samer Tabbash³. (1) General Commission for Scientific Agricultural Research (GCSAR), Hama Agriculture Research Centre, Hama, Syria, Email: m.dahool@gawab.com; (2) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria; (3) Department of Plant Protection, Faculty of Agriculture, Tichreen University, Lattakia, Syria.

The experiment was conducted during 2004 and 2005 seasons on spring potato at Hama Research Center. The pre-emergence herbicides evaluated were Prometryne (at 750 g a.i/ha), Linuron (1250 g a.i/ha), Isoxaflutol (67.5 and 90 g a.i/ha), Isoxaflutol+Linuron (37.5+750 g ai/ha), Cyanazine (800 g a.i/ha), Cyanazine +Linuron (800+1220 g a.i/ha), Oxadiazon (1250 g a.i/ha). The post-emergence herbicide evaluated was Ammonium Glyphosinat (400 g a.i/ha). The herbicides were tested for their efficiency in weed control and their phytotoxicity on potato. Two other treatments were also included; manual weeding which was carried out three times during the growing season, and the non-weeded check as a control. The broad-leaf weeds were prevalent, while the narrow weeds were rare. The results revealed the existence of slight toxicity of the tested herbicides on potato plants which recovered later, except for Cyanazine and Oxadiazon which didn't show any toxic symptoms. All herbicide treatments significantly controlled the broad-leaf weeds, and they were superior to the non-weeded control. This superiority persisted for over 72 days after planting. Oxadiazon reduced the dry weight of weeds by 98.63 and 98.91% in both seasons, respectively. The herbicide Isoxaflutol alone at the two rates or the mix with Linuron reduced weed dry weights by 92.41, 88.94 and 74.67% in 2004 and 87.12, 94.37 and 83.53% in 2005, respectively. Cyanazine had the lowest efficiency as it reduced dry weight of weeds by 53.04 and 43.65% in both seasons.

respectively. All treatments were superior to the non-weeded control. The productivity of all treatments was close to that of manual weeding in the second season, except for the herbicides Prometryne and Cyanazine.

W 32

CHEMICAL CONTROL OF WEEDS IN COTTON FIELDS IN SYRIA. Bahaa Al-Rahban¹, Ali Shaker¹, Akram Baqleh¹, Khalil Al-Husien², Abd Aallah Al-Moulla² and Saied Al-Sa'adoun². (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria, Email: gcsarpartect@mail.sy; (2) GCSAR, Scientific Agricultural Research Center in Deir Ezzor, Syria.

Experiments were carried out at Scientific Agricultural Research Center in Deir Ezzor during 2003 and 2004 growing seasons using a number of herbicides namely, trifluralin, prometryn and cyanazine post-cultivation and pre-emergence, and one herbicide named pyrithiobac-sodium at several concentrations post-cultivation and post-emergence. The efficiency of herbicides for controlling broad leaved-weeds in cotton fields and toxic effect on cotton and productivity were evaluated. The results revealed that all treatments were superior to the un-weeded check, with no significant differences among them. Pyrithiobac-sodium with/without surfactant at both testing concentrations was superior to other herbicides in controlling *Amaranthus* spp., while Prometryn and Cyanazine were superior to other herbicides, as they achieved 100% control of *Chenopodium album* and 91.9–100% of *Portulaca oleracea*. Applied pre-germination herbicides Trifluralin, Prometryn and Cyanazine were superior to post-germination pyrithiobac-sodium in controlling *Echinochloa crus-galli* with an efficiency of 87.8–96.4%. All treatments brought in obvious increase in productivity versus non-weeded check, with no significant differences among treatments. The herbicide Trifluralin was superior to pyrithiobac-sodium.

W 33

EFFECTS OF DIFFERENT HERBICIDES ON WEED CONTROL AND GROWTH OF PETUNIA AND MARIGOLD. G. Saecidi, M. Keshavarzi, K. Razmjoo and M. R. Khajhepour, Department of Agronomy, Isfahan University of Technology, Isfahan 8415683111, Iran, Email: gsaeidi@cc.iut.ac.ir

Petunia (Petunia hybrida) and marigold (*Tegets erecta*) are widely grown as ornamental plants in the landscape of Isfahan province in the central part of Iran. Weed control is one of the important aspects of growing these plants and hand control is time consuming and costly. The objective of this study was to investigate the effects of three herbicides of Treflan, Dactal and Galant on weed control and growth of petunia and marigold along with two check treatments of weed-free and weedy (no control of weeds) using a randomized complete block design with 4 replications. The experiments were conducted at the Research Farm of Isfahan University of Technology. The results showed that application of Treflan, Dactal and Galant herbicides reduced 61, 46 and 24% of shoot dry weight/m² of weeds, respectively; compared to the weedy check. However, the effect of Galant was not statistically significant. Compared to the weed-free check, application of the herbicides had no significant effect on plant height, but significantly reduced the plant longevity. Treflan and Galant significantly reduced the plant growth of petunia. In marigold, shoot dry weight/m² of weeds was significantly reduced by 35, 26 and 12% due to the application of Treflan, Dactal and Galant, respectively. Application of Treflan and Dactal significantly reduced the plant height and growth of marigold and all herbicides significantly reduced longevity of the plant.

W 34

DEVELOPMENT OF A TRANSGENIC LENTIL RESISTANT TO THE HERBICIDE GLUFOSINATE AMMONIUM (PHOSPHINOTHRICIN). Fateh Khatib¹, Samir Koudsieh¹ and Michael Baum². (1) Department of Plant Protection, Faculty of Agriculture, Aleppo University, Syria, Email: f.khatib@cgiar.org; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: m.baum@cgiar.org

Lentil (*Lens culinaris* Medik.) is an important cool-season crop in North Africa, West Asia, the Middle East, the Indian Subcontinent and North America. Lentil ranks seventh among grain legumes and is grown on over 3.5 million hectares in over 48 countries with a total production of over 3 million metric tons. Lentil is also one of the important food legumes grown in Syria. One of the major production problems is weed infestation and the low competitiveness of lentils. Very few herbicides are currently approved for this crop. This study, therefore, aims to investigate the usefulness of introducing an herbicide tolerance gene into

lentil. The plasmid construct pCGP1258 harboring the bar gene conferring resistance to the broad spectrum herbicide glufosinate ammonium (phosphinothricin or PPT) was inserted in *Agrobacterium tumefaciens* strain Agl0, in addition to the gus reporter gene. Three lines ILL5582, ILL5883 and ILL5588 were used for transformation. Transgenic events after 6-9 rounds of selection were grafted on non transgenic root stock. The presence of the transgene was confirmed by the polymerase chain reaction (PCR). Specific primers were used to detect 250 base pairs of the bar gene. Bar gene expression leads to inhibition of the herbicidal action by producing the enzyme phosphinothricine acetyl transferase (PAT). This functional assay was used under controlled environmental conditions by leaf painting with 600 mg/l PPT, to identify T₀ plants resistant to the herbicide. Also, the expression of gus gene was detected by histochemical assay in the leaflets and flowers to confirm the results of the leaf paint assay. The glufosinate ammonium resistance was successfully transferred to T₁ generation through inheritance.

W 35

HERBICIDE RESISTANT SORGHUM: RISKS AND BENEFITS. Kassim Al-Khatib and Mitch Tuinstra, Agronomy Department, Kansas State University, Manhattan, KS 66506, Email: khatib@ksu.edu

Weed infestations may reduce grain sorghum production up to 55%, depending on weed population. In addition, weeds may decrease grain quality, increase insect and disease pressure, and increase harvest difficulty. Herbicides are an important component in grain sorghum weed management. Currently, many grain sorghum producers use preplant herbicides such as atrazine and metolachlor, followed by postemergence herbicides such as atrazine, 2,4-D, and dicamba. However, lack of soil moisture may decrease the efficacy of preplant herbicides, and postemergence herbicides may cause crop injury. In addition, several important weeds, especially the *Amaranthus* spp., have developed resistance to atrazine. Furthermore, postemergence herbicides may exhibit poor control of grass weedy species such as *Digitaria* spp., *Echinochloa crusgalli*, and *Setaria* spp. In many parts of the world, there are no effective postemergence herbicides available to control grassy weeds in sorghum. A herbicide-resistant sorghum (HRS) accession that tolerates ALS-inhibiting herbicides has been identified at Kansas State University. The resistant gene was obtained from a wild relative of sorghum and successfully transferred to grain sorghum varieties. Herbicide resistance is controlled by a single dominant gene. HRS sorghum is cross-resistant to imidazolinone and sulfonylurea chemistries. This technology has excellent potential for postemergence control of grass and broadleaf weeds in sorghum. In addition, the technology is being evaluated for use in controlling the parasitic weedy species *Striga*. Field experiments in West Africa showed that sorghum seeds treated with 0.0125 mg active ingredient metsulfuron/seed prior to planting provided greater than 90% control of *Striga* for the first 60 days after planting. The acceptance of HRS among grain sorghum producers is very likely because ALS-inhibiting herbicides are used at relatively low use rates, exhibit low mammalian toxicity, low surface and ground water contamination, and high selectivity. Despite the potential benefits for use of HRS, concerns have been raised regarding the development and commercial release of HRS including development of herbicide-resistant weeds, weed population shifts, and gene flow of herbicide resistance to wild relatives including *Sorghum halepense*.

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PROGRAMMING OF THE CHEMICAL CONTROL OF *SOLANUM ELAEGNIFOLIUM* CAV. DEPENDING ON THE NONSTRUCTURAL CARBOHYDRATES IN THE PLANT. Majed Khanas, General Commission for Scientific Agricultural research, Aleppo Center, Aleppo, Syria, P.O. Box 4195, Email: hayat73@scs-net.org

Silver-leaf nightshade *Solanum elaeagnifolium* is one of the most important weeds in many countries. Due to its prevalence in the northern-east provinces of Syria in the last ten years, a study of carbohydrate translocation was carried out in order to optimize the control of this plant, by chemical or mechanical means. Silver-leaf nightshade plants were collected from three different high infested regions including road sides, cotton fields, and uncultivated areas. Sugar movement was followed up in the different parts of plant monthly after extraction of dried material by hydrolysis, and using anthron test and measuring color density at 612 nm. Results showed that silver-leaf nightshade's root is the essential part for storing non-structural carbohydrates, whereas stem and root collar were secondary storing parts, so sugars concentration was followed in the root where high concentration was recorded at diapause stage and the end of fenological

development. This concentration began to decrease when plant started to regenerate and continue until the end of the budding stage, when the lowest concentration of sugars was recorded at this stage at the different geographic locations. This reduction was followed by an increase which continued until complete maturity. Chemical control by systemic herbicide was more effective at the end of flowering stage which is the time for sugar movement to the roots. The lowest level of sugar content for mechanical or chemical control by contact herbicide was at the beginning of flowering. Depending on these results most tested herbicides showed high efficacy to control silver-leaf nightshade outside the cultivated areas when it was applied at the end of flowering stage. The herbicides Imazapyr, 4 liter commercial product per ha and Picloram, 1 liter commercial product/ha were effective in controlling silver-leaf nightshade based on density, dry weigh, and number of fruits with efficacy ranged between 84.30 and 100%.

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ALLELOPATHY: PROBLEMS AND OPPORTUNITIES – A REVIEW. Muhammad Azim Khan and Khan Bahadar Marwat, Department of Weed Science, NWFP Agricultural University Peshawar 25130, Pakistan, Email: ahmadzaipk@yahoo.com

Allelopathy refers mostly to the harmful effect of one plant on the other through the release of toxic substances. It is predicted that, in the near future, the exploration of allelopathy will be used as a weed control strategy. The use of allelopathy against weeds can be used through biotechnological approaches or simple application of plant extracts. Allelopathy needs to be explored extensively, as many researchers advocate that allelopathy leads to the monoculture and harmful to the biodiversity. Pollens of few allelopathic species can stop fruit setting in many vegetables and fruit trees. Allelopathic substances could cause soil pollution, inhibit nodulation in legumes, dangerous for fish and other sea animals in aquatic bodies, and adversely affect the physiological functions of certain plants. Detailed knowledge of individual species for allelopathins will help in utilizing weeds against weeds and crops against weeds. Joint efforts of weed scientists, chemists, ecologists, and taxonomists are required to achieve these objectives. Working on this challenge will lead to new discoveries that will keep us excited to learn more, and gain a better understanding of the phenomenon. Equipped with this new knowledge and understanding, we should be able to solve many difficult environmental problems of our time. Exploitation of allelopathy provides unlimited opportunities to contribute in the solution of agricultural problems.

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ALLELOPATHIC EFFECTS OF CUCUMBER (*CUCUMIS SATIVUS* L. CV. IBA') ON CERTAIN COMMON WEED SPECIES IN JORDAN. Jamal R. Qasem and Nabil N. Issa, Department of Plant Protection, Faculty of Agriculture, University of Jordan, Amman, Jordan, Email: jrqasem@ju.edu.jo

Different experiments were carried out to investigate whether cucumber (*Cucumis sativus* L. cv. Iba') possess any allelopathic influence against certain common weed species under laboratory and glasshouse conditions. Full strength aqueous shoot extract of cucumber reduced germination and growth of *Amaranthus retroflexus* L., *Chenopodium murale* L., *Eruca sativa* Mill, *Malva sylvestris* L., *Portulaca oleracea* L. and *Solanum nigrum* L. grown in Petri-dishes. Differences in weed sensitivity to extract were evident; with *C. murale* and *P. oleracea* were the most tolerant. As low as 1 ml extract added to the growing medium was sufficient to reduce germination and growth of all weed species tested, and the effect increased with extract concentration. Water leached from cucumber foliage parts was phytotoxic to all species and significantly reduced their germination (except *C. murale* and *P. oleracea*) and growth, with more harmful effects on roots than on shoots. Volatiles from cucumber shoot extracts were also phytotoxic and the effect was more pronounced on all weeds with stem and root lengths were shortened. Soil-incorporated dry shoot residues enhanced weeds shoot growth but root growth of *C. murale*, *E. sativa* and *M. sylvestris* were affected, indicating that most allelochemicals are volatiles in nature. Decayed residues inhibited shoot growth of *A. retroflexus* and *S. nigrum* and root growth of all weeds except *E. sativa*. Whereas, extract applied to foliage showed no significant effects on weed growth, soil-applied extract was phytotoxic and reduced germination and growth of all weeds with *P. oleracea* being the least affected.

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EFFECT OF POTATO RESIDUES ON THE GROWTH OF SOME CROPS AND WEED SEEDLINGS. Samir Tabbache, Plant Protection Department, Faculty of Agriculture, Tishreen University Lattakia, Syria, Email: tabbache@scs-net.org

Effect of aqueous extract of dried residues of potatoes was evaluated on shoots and roots growth of wheat, chickling vetch, radish, garden cress and dandelion in Petri-dishes and pots. The concentration of 2% and 4% of the extract increased shoot growth of wheat, chickling vetch and radish. However, the 4% concentration inhibited the growth of garden cress and dandelion shoot. The concentration of 2% and 4% reduced root growth of all tested plants especially radish, garden cress and dandelion. The addition of 5% and 10% of dried residues in soil pots reduced lengths and fresh weights of tested plants by 25-75%. It is possible to conduct additional experiments on other plants and weeds for evaluation of the effect of crop residues on the growth of crops and weeds in Agricultural systems.

W 40

ALLELOPATHIC POTENTIAL OF SAFFRON (*CROCUS SATIVUS* L.) AGAINST WEEDS. Mohammad Asgharipour and Mohammad Rashed-Mohassel, Department of Agronomy, Faculty of Agriculture, Ferdowsi University of Mashhad, P.O. Box 91775-1163, Mashhad, Iran, Email: m_asgharipour@yahoo.com

Conventional methods of weed control are weather dependent, costly and labor intensive. Indiscriminate use of chemicals for controlling weeds may pose environmental problems. One of the alternatives to overcome these problems is strategies which employ allelopathy, and the use of bioherbicide for weed management and for the sustainability of agriculture. Saffron is known to contain water-soluble substances that are allelopathic to other plants. Laboratory experimentation through a Petri dish assay with imbibed seeds of saffron leaves and corms extract were toxic on seed germination and root growth of lambsquarter (*Chenopodium* spp.), black nightshade (*Solanum nigrum*) and Johnson grass (*Sorghum halepense*), with strong correlation between extract concentration and toxicity. Radicle elongation of weeds was the most sensitive indicator, and germination was the least sensitive. The phytotoxic effects of aqueous extract on seed germination had two aspects: germination delay and inhibition. The relative magnitude of each aspect depended upon the potency of the extracts. With a strong phytotoxic potential, inhibition of germination was dominant over seed germination, whereas with a weak toxic level, delay was dominant over seed germination. In general, the allelochemicals of the leaves had stronger inhibition of seedling emergence and growth compared to those of the corms. The present study suggests that saffron extracts might be useful as natural herbicides and might also contain numerous growth inhibitors that could be used for the development of biological pesticides. However, further work is needed to specify and verify the allelochemicals produced by this useful plant.

W 41

ALLELOPATHIC EFFECT OF MINT, *MENTHA LONGIFOLIA* ON GERMINATION AND GROWTH OF SOME CROPS. Aolla Estanboli, Ghassan Ibrahim and Anoir Almouemar, Plant Protection department, Agriculture College, Damascus University, Damascus, Syria.

Allelopathy is one of the promising new weed control strategies. Results revealed that, there was negligible effect of the aqueous extraction of wild mint on wheat seed germination, but there was significant effect on germination of barley and wild oat seeds. The germination rate of treated barley seed did not exceed 40% as compared to the control (96%), and the treated wild oat seed 25% as compared to the control 50%. In addition, the aqueous extract reduced the growth of treated seedlings significantly in case of barley and wild oat. The result of 2005 and 2006 showed the sensitivity of barley and wild oat to wild mint extract and this may lead to new strategy in controlling wild barley in wheat fields.

W 42

INHIBITORY EFFECT OF SOIL EXTRACTS CONTAINING RESIDUES OF SUNFLOWER AT DIFFERENT GROWTH STAGES ON GROWTH OF WHEAT AND SUNFLOWER CULTIVARS.

Wasan S. Huseen and Salah M. Saied Al-Tai, Department of Biology, College of Science, University of Mosul, Iraq, Email: Dr_Salahaltai@yahoo.com

Green house experiments were conducted to find out the inhibitory effects of sunflower residue variety (Local and Syrian) at four growth stages (Seedling, elongation, flowering and maturity), at three concentration (2.5, 1.5 and 0.5 %) (w/w) on germination and growth of wheat and sunflower cultivars. The residues of the mature stage of sunflower showed the highest reduction in most treatments, and the 0.5% caused the highest reduction in most of the characters studied. Statistical analysis showed a significant difference between wheat and sunflower cultivars in sensitivity to sunflower residue effects.

Chemical Pesticides

P 1

EFFICIENCY OF DIFFERENT CONCENTRATIONS OF LAMARDOR FS IN WHEAT BUNT DISEASE CONTROL. Emad Al-Maarroof, Farris Fiahd and Sefyan Abdullah. Plant Pathology Department, Agriculture and Food Technology Directorate, Ministry of Science and Technology, P.O. Box 765, Baghdad, Iraq, Email: ealmaarroof@yahoo.com

Common bunt is one of the most important wheat diseases in Al-Jezirah and northern parts of Iraq. Efficiency of Lamardor FS 400 (Tebuconazole) was evaluated as seed dressing to control common bunt disease of wheat in Iraq in comparison with Dividend (Difenoconazole) and Raxil (Tebuconazole). Seeds of two varieties "Intsar" and "Rabia" were artificially inoculated with the teliospores of bunt fungi, while the check treatment was left without inoculation. Inoculated seeds were treated with 5, 7.5, 10, 15 and 20 ml of Lamardor FS /100 kg of wheat seeds and with 1.5 and 2 g/100 kg of wheat seeds of Raxil and Dividend, respectively. Treated seeds were sowed in rows at different. Results revealed that all Lamardor FS treatments were very effective in controlling the disease, where the reduction of disease ranged between 97-100% and 98-100% in "Rabia" and "Intsar", respectively, in comparison with the control treatment. Furthermore, there were no significant effect of the fungicides on seed germination and seedling height. Meanwhile, Raxil and Dividend resulted in 97.2 and 100% reduction in the mean of disease incidence, respectively.

P 2

A COMPARATIVE STUDY ON THE EFFECT OF SOME FUNGICIDES ON TOMATO GRAY MOLD. Mohamed Tawil¹, Watfa Al-Ibrahim² and Baraa Mouhrez². (1) Faculty of Agriculture, Tishreen University, Lattakia, Syria, Email: mtawil@scs-net.org; (2) General Commission of scientific Agricultural Research, Douma, P.O.Box 113, Damascus, Syria.

An experiment was conducted to study the relative effectiveness ratio of three systemic fungicides: Elsa WP (50% Carbendazim), Powmyl WP (25% Diethofencarb) and Switch WG (37.5% Cyprodinil + 25% Fludioxanil) to control tomato gray mold disease caused by *Botrytis cinerea* under greenhouse conditions. These fungicides were sprayed as curative treatment using the concentration suggested by producers (75, 60 and 100 gr/100 L water, respectively). The products were sprayed twice; the first took place when the infection had reached more than 70% of the plants, and the second 10 days later. The efficacy was evaluated by the percentage and intensity of infected leaves. Accordingly, Switch gave the highest efficiency (70.0%), Powmyl was less effective (59.5 %), whereas Elsa was inactive (32.5%). The mixture of (Elsa + Powmyl) proved to be more effective than Elsa or Powmyl alone (67.2%).

P 3

EFFICIENCY OF SOME FUNGICIDES AGAINST WHEAT BROWN RUST (*PUCCINIA RECONDITA* F.SP. *TRITICI*). Nora Alliou¹, Samir Messadia¹, Jamel Boukheloua² and Saliha Attab³. (1) Department of Biology, Science and Engineer's Faculty, 8 Mai 1945 University, Guelma 24000, Algeria, Email: alliou¹_24@yahoo.fr; (2) Department of Biology, Laarbi Tebessi Centre University Tebessa 12000, Algeria; (3) Department of Biology, Badji Mokhtar University, Annaba 23000, Algeria.

In order to compare the efficiency of some fungicides used in Algerian market against wheat brown rust (*Puccinia recondita* f.sp. *tritici*), a study was conducted to evaluate three fungicides: ARTEA 330 EC (Cyproconazole + Propiconazole) which has been applied in the tillering and the booting stages at the dose 0.4 l/ha, TILT 250 EC (Propiconazole) applied at booting stage at the dose of 0.5 l/ha, and PUNCH CS (Flusilazole + Carbendazime) applied at tillering stage at the dose 0.9 l/ha. The efficiency was evaluated on the basis of agronomical parameters in addition to infection severity of treated plants. The results showed significant differences among the treatments, and Artea 330 EC gave satisfying results when applied at the booting stage.

P 4

EFFICACY OF SOME FUNGICIDES AND ORGANIC ACIDS IN CONTROLLING THE COVERED SMUT DISEASE ON WHEAT. Suliman Omar¹, Omran Youssef², Haleim Youssef² and Abd Al Razak Al Naqouh³ (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria, Email: gcsarpartect@mail.sy; (2) Al-Qamishli Agricultural Research Center, Al Haska, Syria; (3) Al-Ghab Agricultural Research Center, Hama, Syria.

Field trials were conducted at Al Qamishli agricultural research Center (non irrigated) and at Al Ghab agricultural research center (irrigated) during 2002/2003 and 2003/2004 growing seasons, to evaluate the field efficacy of seed treatment with three fungicides: Dividend at 0.1%, Bremis at 0.2% and Vitaflo at 0.2% and two organic acids lactic acid and acetic acid at two concentrations, 0.2% and 0.3%, against the covered smut disease on soft wheat (Sham 4). The artificial infection of wheat seeds was applied using 2 g of spores/kg of a mixture *Tilletia tritici* and *T. laevis* (1:1). The results showed that Dividend 0.1%, Bremis 0.2% and Lactic Acid 0.30% were more effective than Vitaflo 0.2%, lactic acid at 0.20% and acetic acid at 0.2 or 0.3 % for two locations and two seasons. The efficacy of lactic acid was high in controlling the covered smut, but the high rate (0.30%) reduced seeds fertility and reduced germination rate to 70% in Al Qamishli, and 90% in Al Ghab, whereas the low rate (0.20%) caused a reduction in seeds germination up to 80% in Al Qamishli.

P 5

SIDE EFFECT OF SOME FUNGICIDES ON NONSYMBIOTIC NITROGEN-FIXING BACTERIA. Mounir A. Abdel-Aziz, Plant Pathology Research Institute, Agricultural Research Center, 9 El-Gamaa Street, Post code 12619, Giza, Egypt.

The present investigation was planned to study the influence of four fungicides on wheat plant growth, nitrogen content of plants and nitrogenase activity in soil under greenhouse condition. The tested fungicides were applied as seed treatments at two rates, 1 and 5 fold the recommended rate. Results revealed that Sumi-eight 5% EC and Sumi-eight 2% WP were the best treatments in increasing plant height and dry weight of wheat plants, and Vitavax 200 75% WP was the most toxic fungicide which significantly reduced plant height and dry weight of wheat plants than other treatments, especially at the higher level of application. Sumi-eight 5% EC and Sumi-eight 2% WP were accompanied by significant increases in nitrogen content than other fungicidal treatments. Vitavax 200 75% WP and Premis 2.5% FS were the most harmful fungicides with respect to nitrogen content especially at the higher level of application. Seed treatments with Sumi-eight 5% EC and Sumi-eight 2% WP resulted in the highest increase in nitrogenase activity in soil. However, Vitavax 200 75% WP and Premis 2.5% FS showed adverse effects on nitrogenase activity. Control treatment without fungicides increased plant growth, nitrogen content and nitrogenase activity.

P 6

EFFECT OF CERTAIN INSECTICIDES ON POPULATION DENSITY OF SPINY BOLL WORM (*EARIAS INSULANA*) AND THE YIELD OF AL ZAHR COTTON UNDER FIELD CONDITIONS. Slim G. Gargees and Nabil M. Al Mallah, Plant Protection Department, College of Agriculture and Forestry, Mosul University, Mosel, Iraq, Email: nbl_mstf@yahoo.com

The present study was carried out during 2003 in Ninawah Governorate in two plots at the same location. The first plot was treated with insecticides using a field spraying program consisted of three applications of confidor 20%, medamec 1.8%, endosulfan 35% sequentially on 25/8/2003 (insect emergence), 20/9/2003 and 10/10/2003. The second plot was not treated with insecticides and served as the control treatment. The field spraying program of the three tested insecticides caused a clear decrease in the number of larvae of *Earias insulana* which reached by the end of the experiment to 3 larvae/100 bolls, whereas the number of larvae in the control was 82 larvae/100 bolls. The data obtained indicated that the yield of one donum treated with insecticides was 1290.84 kg alzahr cotton, and only 818.92 kg in the control plot.

P 7

THE EFFICIENCY OF CERTAIN BIOINSECTICIDES IN CONTROLLING THE DATE MOTH *EPEHSTIA CALIDELLA* (GUENEE) INFESTING DATE PALM TREES IN THE NEW VALLY GOVERNORATE, EGYPT. Gamal Karaman, Plant Protection Department, Faculty of Agriculture, Minia University, El-Minia, Egypt, Email: radwakaraman@yahoo.com

The effectiveness of three natural and biological products for the control of the date palm moth *Ephestia calidella* infesting date palm trees in the new valley Governorate, Egypt were evaluated. Two bio-bacterial products were used. The first product is Dipel (16000 I.U. of *Baccillus thuringiensis* var. *alesti* and the second product is Delphin (32000 I.U. of *B.thuringiensis* var. *kurstaki*). The third one used was Spinosad (Tracer 24 SC) which is a metabolite product of the *Actinomycece* bacteria and yeast fungus *Saccaropolyspora spinosad*. Results showed that Spinosad was the most effective product used resulted in a 93.18% pest infestation reduction of the pest during the two years of study. Meanwhile, the other two products resulted in a 72.10 and 61.60% pest infestation reduction for the products Delphin and Dipel, respectively. Furthermore, no phytotoxicity was observed for any of these products and they proved to be effective under dry and hot conditions.

P 8

OVICIDAL AND REPRODUCTIVE EFFECTIVENESS OF CERTAIN CHITIN SYNTHESIS INHIBITORS AGAINST THE SPINY BOLLWORM, *EARIAS INSULANA* (BOISD.). M.I. Abdel-Megeed, S. Dahroug, G. Hegazy, and M. Bata. Plant Protection Department, Faculty of Agriculture, Ain Shams University, Shoubra El-Kheima, Cairo, Egypt, Email: m_mageed@yahoo.com

The present work was carried out to study the ovicidal and reproductive effectiveness of three chitin synthesis inhibitors (CSI) against the spiny bollworm, *Earias insulana* (Boisd.). Data showed that, the ovicidal activities varied tremendously due to the chemical nature of the tested compound, the tested concentration and the age of treated eggs. Against one day old eggs, hexaflumuron proved to be the most effective compound followed by chlorfluazuron and flufenoxuron, respectively. The LC₅₀ values being were 285, 600.7, and 975.2 ppm, respectively. Accordingly the toxicity index based on the LC₅₀ of the most effective compound (hexaflumuron=100) reached 47.4 and 29.2 in case of chlorfluazuron and flufenoxuron, respectively. The same trends was obtained with two days old eggs, but were more tolerant to the three tested chitin synthesis inhibitors compared with one day old eggs. The deleterious effect on reproductive capacity varied according to the chemical nature of the tested compound and the age of treated eggs. Chlorfluazuron proved to be the most effective followed by flufenoxuron, and hexaflumuron was the least effective. The treated two days-old eggs showed sensitivity in lowering the reproductive potential compared with the treated one-day old eggs. The rate of egg absorption of mated female moths after death was increased as a result of CSI's effect when compared with the untreated check.

P 9

THE EFFECTIVENESS OF SOME INSECTICIDES ON THE IMMATURE STAGES OF WHITEFLY *BEMISIA TABACI* AND ITS PARASITIDS IN BEAN (*PHASEOLUS VULGARIS*) FIELDS. Abd El-Ghany M. El-Sayed and Mohamed I. Shedeed, Plant Protection Institute, Dokki, Giza, Egypt, Email: dr_homam@hotmail.com

Field experiments in Egypt were carried out to investigate the effectiveness of four insecticides (Dinotefuron 20%, Diafentheuron 25%, Chlorpyrifos methyl 50% and Carbosulfan 25%) on immature stages of *B. tabaci* in bean fields and on the parasitoids that attack larvae and pupae *Eretmocerus mundus* and *Encarsia lutea*. After the second spray on the seventh day the egg population was less susceptible to insecticides treatments than after the first spray (14-44% and 56-91% reduction, respectively). Larval and pupal populations were significantly reduced after all treatments, and reached 69-93% and 56-72% reduction, 7 days after the first and second application, respectively. Parasitism rate were affected by insecticides treatment and rates were more reduced after the second spray than after the first spray, compared with untreated plots.

P 10

EFFECT OF ADDING ADJUVANTS ON THE LEVEL OF PROFENOFOS AND CARBOSULFAN RESIDUES ON COWPEA GREEN PODS. M.H.A. Soliman¹, A.E. Omer² and A.A. Shalaby². (1) Plant Protection Research Institute, ARC, Dokki, Egypt; (2) Faculty of Agriculture, Zagazig University, Egypt, Email: dr_homam@hotmail.com

The work aimed to study the effect of adding glue, Hamadul A600 and Emulgator as adjuvants on profenofos and carbosulfan residue levels on cowpea green pods. The results indicated that the residue level of profenofos was higher than Carbosulfan following the addition of any of the three tested adjuvants. The recommended rate of Profenofos alone or Carbosulfan + glue gave the highest amount of initial residues. On the other hand, the disappearance rate of profenofos treatment was more rapid than carbosulfan treatments.

P 11

EFFECT OF SUMIALPHA^{5EC}, COMPLY^{25WP} AND AGERIN^{6.5WP} INSECTICIDES ON CORN STEM BORERS. Radwan Yaqti¹, Christian Borgemeister², M.Walid Idraw¹ and Ebraheem Al-Jouri¹. (1) Plant Protection Department, Faculty of Agricultural Engineering II, Deir El-Zor, P.O. Box 358, Syria, Email: Jouri@myway.com. (2) Institute of Plant Diseases and Plant Protection, University of Hannover, Germany.

The corn stem borers *Sesamia* sp. and *Ostrinia* sp. are considered the major pests of *Zea mays* L., because they significantly decrease the quantity and quality of yield. A study in the eastern region of Syria conducted during 2004 and 2005, to control these stem borers with the insecticides Sumialpha, Comply and Agerin. The results showed that infestation rate with *Sesamia* sp. and *Ostrinia* sp. reached up to 38% on stems and 18.5 % on ears control plots, whereas the use of insecticides Sumialpha, Comply and Agerin reduced the infestation rate in stems to about 8.1, 13.5 and 21.2 %, respectively, and to about 6.1, 7.9 and 11.1 % in ears by the three chemicals, respectively. These treatments led to a significant increase in corn yield.

P 12

EFFICACY OF SOME INSECTICIDES ON LARVAE OF COTTON LEAF WORM *SPODOPTERA LITTORALIS* (BOISD.). Adel Jamil Hourieh¹ and Maimoon Al- Jabal². (1) Plant Protection Department, Faculty of Agriculture, Tishreen University, Syria; (2) Agricultural Research Center, Tartous, Syria, Email: emma75@maktoob.com

Four insecticides of different chemical groups i.e. Avaunt 15% (a.i Indoxacarb), Tracer 22.8% (a.i Apinosad), Lannate 90% (a.i Methomyl) and Cyperkill El Nasr 25% (a.i Cypermethrin) were tested against larval stages (L1+L2) and (L3+L4) of cotton leaf worm under laboratory and plastic house conditions. The results under Lab condition showed that Avaunt (0.025% a.i) was the most effective and gave 88.9% mortality of larvae L1+L2 and 83.3% of larvae L3+L4. Whereas Tracer (0.05% a.i), Lannate (0.05% a.i) and Cyperkill El Nasr (0.025% a.i), gave 66.7%, 66.1%, 55.6% mortality of larvae L1+L2 and 61.1%, 61.1%, 50% mortality of larvae L3+L4, respectively. The results under plastic house condition showed almost similar effect and Avaunt (0.025% a.i) was also the most effective against cotton leaf worm larvae. No phytotoxicity was observed.

P 13

APPLICATION OF CORN SEED TREATMENT WITH INSECTICIDES AGAINST THE STEM BORER *SESAMIA CRETICA* LED. Abdul-Sattar A. Al-Khafaji and Tadamun Eskander, Plant Protection Research Center, Baghdad, Iraq, Email: sautalhamam@yahoo.com

Several field experiments were conducted at Abu-Graib Experimental station during 1999–2001 to study the efficacy of different doses of Cruiser, Marshal, Lesak as seed treatments, IGR's and biological insecticides against corn stem borer *Sesamia cretica* Led. Results indicated that both Cruiser and Marshal gave better protection from infestation by the borer which led to good growth and increased yield. Although other insecticides gave also good protection in controlling this pest, but they were less effective than seed treatment insecticides.

P 14

EFFECTS OF SOME INSECTICIDES ON FAT BODIES OF HOUSE FLY *MUSCA DOMESTICA* L.

Karim M. Ahmed¹, Talal T. Mahmud² and Abdel-Basset M.Amin³. (1) Ministry of Higher Education and Scientific Research, Sulamani Technical College, Department of Community Health, Foundation of Technical Education, Iraq, Email: dr_amin57@hotmail.com, savo1996@yahoo.com; (2) Department of Forest, Agriculture College, University of Dhok, Iraq; (3) Department of Plant Protection, Agriculture College, University of Salahaddin, Iraq.

The present work was carried out to investigate the effect of four insecticides [Thiamethoxam (Actara), Malathion (Vapmalathion), Deltamethrin (Deltamac), and Lambda-cyhalothrin (Icon)] at three concentrations (low, medium and high) on fat bodies of adult House fly (*Musca domestica* L.) under laboratory conditions (25-27 °C, 40-50% RH and 12 hours light). The results obtained indicated that the structures of fat bodies were changed depending on the tested concentrations. The low concentrations (0.78, 75.0, 4.75 and 15 ppm) caused the occurrence of vacuolar and cytoplasmic granulation. The medium concentrations (1.56, 150, 9.5 and 30.0 ppm) causes different stages of inclusion deformation and degeneration of the cytoplasm. Whereas the high concentrations (3.12, 300.0, 19.0 and 60.0 ppm) caused a serious damage to the fat bodies which finally exploded.

P 15

BEHAVIOUR OF OXAMYL RESIDUES IN SOIL PLANTED WITH TOMATO. M.J. Al-Hajjar and R. Mansour, Faculty of Agriculture, Damascus University, Damascus, Syria, Email: hajjar-j@scs-net.org

Behavior of oxamyl residues was investigated in soil planted with tomato, and the chemical was applied at the recommended rate (10-30 kg/ha). Levels of oxamyl residues in soil and plant samples were determined for a period of three weeks after treatment. The residues of oxamyl in leaves, fruits, and soil layers 0-10 and 30-40 cm were determined by high performance liquid chromatography (HPLC), with an ultra violet (UV) detector at 233 nm. The data obtained showed that oxamyl had high mobility in soil which was reflected in the variation in the concentration of oxamyl residues at 0-10 and 30-40 cm depth. Oxamyl moved from soil to leaves where it was found in high concentration. In fruits, the levels of oxamyl residues did not change during the period of the experiment and stayed below the maximum residue limit (2 mg/kg).

P 16

INFLUENCE OF PESTICIDES AND FERTILIZERS ON COTTON BOLLWORMS INFESTATION AND SOIL ENZYMES. A.A. Hamady and M.S. El-Shahaat, Plant Protection Research Station, Agriculture Research Center, Alexandria, Egypt, Email: Ayten999@yahoo.com

A field trial was conducted on the cotton variety Giza 70 during two growing seasons to evaluate the efficacy of certain pesticides against the cotton bollworms, yield loss as well as their influences on soil enzymes; dehydrogenase and urease under chemical and microbial fertilizers (NPK, 50% NPK plus Microbin bio-fertilizer), at Alexandria Governorate, Egypt. The pesticides applied individually and in sequence (Dursban- Karate- Larvin). The results obtained indicated that Larvin (Thiodicarb) had the lowest infestation reduction rate (76.94%). The efficacy of pesticides was higher with Microbin and NPK fertilizers (89.1%) than that with NPK fertilization (81.7%) during the 1st season, and were similar to those obtained in the 2nd season. At the end of season, the loss in cotton bolls was 6.32% and 3.18% with NPK fertilization type and using 50% NPK plus Microbin bio-fertilizer during the 1st season, respectively. Moreover, the values corresponding to the 2nd season were 6.46% and 5.92%, respectively. On the other hand, the pesticides reduced dehydrogenase activity showing the highest decreasing effect was associated with chlorpyrifos (Dursban) treatment. Urease activity was also decreased by the pesticides (36.2%- 43.24%). The enzymes were not affected by the fertilization treatments.

P 17

EVALUATION OF SOME SELECTED PESTICIDES AGAINST TWO POD BORERS *HELICOVERPA ARMIGERA* AND *ETIELLA ZINCKENELLA* POPULATIONS INFESTING COWPEA IN THE NEWLY RECLAIMED REGIONS IN EGYPT. Gehan Y. Abdou and E. F. Abdalla, Pest and Plant Protection Department, National Research Centre, Dokki, P.O. Box 12622, Egypt, Email: Gegeabdou@yahoo.com

The two pod borers *Helicoverpa armigera* Hubner and *Etiella zinckenella* Treitschke are the most destructive insect pests which infest several crops of leguminosae in Egypt. Field experiments were conducted to evaluate the efficacy of some relatively safe compounds beside the conventional pesticides for control of these pests on cowpea (*Vigna unguiculata*) under the conditions of newly reclaimed regions. The results revealed that most of the treatments were able to suppress the levels of infestation to different degrees according to the nature of the tested compounds and the number of sprays applied. Application of non-traditional compounds such as thiamethoxam (neonicotinoid group) or indoxacarb (oxadiazine group) significantly reduced the larval populations of *H. armigera* by 70-75% and *E. zinckenella* by 56-57%, respectively. Plots sprayed with methoxyfenozide (non-steroid ecdysone) provided satisfactory control (60% reduction) against *H. armigera* population while exerted weak activity (< 26%) against *E. zinckenella* populations. On the other hand, the potency of the other pesticides; chlorpyrifos (organophosphate) or cypermethrin (pyrethroid) were the most effective pesticides against both species giving 73-80% reduction in infestation. However all the tested pesticides and rates used had low residual effect and thus, weekly application to protect the plants of new insect attack was necessary. Treatments received six applications, throughout the entire season, effectively contained the damage caused by pest population more than those received four or two applications. At harvest, high grain yield was obtained in the plots treated 6 times with the tested compounds. In general, chlorpyrifos was the superior compound which led to 45.9% increase in yield over the control, followed by thiamethoxam, indoxacarb, cypermethrin (38.8%), and methoxyfenozide (33.9%). Moreover, remarkable increase in the rate of damaged grains (~28.0%) was recorded in all treatments sprayed twice throughout the season, while the corresponding values in those received 6 applications were limited to 13.6-16.4%. The effectiveness and moderate persistence of such new compounds, beside their low mammalian toxicity make them promising agents when used alone or with other control measures on cowpea plants.

P 18

ESTERASE ALTERATION IN RESISTANT STRAINS OF COTTON APHID, *APHIS GOSSYPHII* (GLOVER) TO ORGANOPHOSPHORUS COMPOUNDS. Homam B. Homam, M. I. Shedeed and H. Abd Al-Daeim Mohamad, Plant Protection Research Institute, ARC, Dokki, Egypt, Email: dr_homam@hotmail.com

Adults of cotton aphid (*Aphis gossypii*) were exposed to selection pressure of Malathion (organophosphorus (OP) insecticide) for 15 generations to obtain a resistant strain. Five substrates (α -naphthyl acetate, indoxyl acetate, lurate acetate, myristate acetate and acetylthiocholine iodide) were screened for selecting the most suitable in measuring the enzyme activity. The results showed that the esterase activity could be measured by using α -naphthyl acetate and indoxyl acetate to predict the level of OP resistance, as well as a marker for OP resistance in field populations. On the other hand, bands No. 1, 3 and 6 were classified as carboxyesterase. The data obtained may help to improve the approach how to manage resistance to organophosphorus insecticides.

P 19

INFLUENCE OF PHYTOSANITARY TREATMENTS ON THE COMPOSITION OF APPLE TREE LEAVES AND ON THE FLUCTUATION OF *PANONYCHUS ULMI* KOCH POPULATIONS AND *APHIS POMI* DE GEER IN AN ORCHARD AT MITIDJA (ALGERIA). Zahr-Eddine Djazouli¹, Bahia Doumandji² and Sihem Ziouch¹. (1) Laboratory of Agricultural and Forest Zoology, University of Blida LP 270, Road of Soumaa, Blida, Algeria, Email: zahr2002@yahoo.fr; (2) National School of Agronomy, El-Harrach Algiers, Algeria, Email: doumandjimitiche@yahoo.fr

The efficiency of Ultracide 40 and yellow oils to control some apple pests and their side effects on the constituents of apple leaves were evaluated in an orchard of Mitidja, Algeria. The results obtained

showed that Ultracide 40 was effective against *Panonychus ulmi* (Arachnida: Tytranychidae) and *Aphis pomi* (Homoptera: Aphididae). Whereas, yellow oils caused immediate effect against *A. pomi* eggs, but were not effective against stages of *P. ulmi*. At the microscopic level, results of quantitative analysis of leaves minerals of apple tree at the beginning and the end of the test showed that the phytosanitary treatments had an influence on the concentration of potassium, magnesium, phosphorus and calcium; and these can influence the fluctuation of the tested pests population. *A. pomi* populations correlated positively with phosphorus and negatively with calcium contents. The quantities of water soluble proteins measured did not influence *A. pomi* populations. Results indicated that *P. ulmi* populations correlated positively with magnesium content, inspite the fact that there was a negative correlation between the population density of this species and the watersoluble proteins.

P 20

THE FIELD EFFICACY OF THIAMETHOXAM AND IMIDACLOPRID AS SEED TREATMENT COMPARED TO SPRAY APPLICATION TO CONTROL SOME INSECT PESTS IN FABA BEAN, WHEAT AND CORN IN SYRIA. Madian S. Kasem¹, Sameer J. Assaf¹, Ahmad J. Ibrahim¹, Mohamed Ibrahim², Omran Yousef³ and Haleem Yousef³. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria; (2) GCSAR, Scientific Agricultural Research Center in Homs, Homs, Syria; (3) GCSAR, Scientific Agricultural Research Center in Qamishli, Syria.

The efficacy of two insecticides was evaluated as a seed treatment: Cruiser 35% F.S (thiamethoxam) and Gaucho 70% W.S (imidacloprid) to control *Aphis fabae* in faba bean at two locations in Damascus country side and Homs during 2004/2005 growing season. These chemicals were applied as seed treatments before sowing, and were compared with Actara 350 F.S (thiamethoxam) and Confidor 200 W.S (imidacloprid) sprays at the beginning of infestation with the recommended rates. Living insect counts were made one day before spraying and 1, 2, 3, 4 and 5 weeks after spraying. In wheat field the same treatments were evaluated in controlling *Zabrus tenebriodes* in Al Qameshli station. Counts in infested plants were made one-day before spraying and 2, 4, 6 and 8 weeks after spraying. Cruiser was evaluated for controlling *Zygnidia scutellaris* in the corn fields in Damascus countryside during 2004/2005 season. Counts of infested leaves were made two months after sowing. The efficacy of seed treatments ranged between 99.7-99.9 % in Damascus Country side, compared to 85.7-99.6% for spray treatment. In Homs, efficacy of seed treatments was 98.2-99.8%, whereas for spray application it was 93.8-99.3 %. At Al Qameshli, the efficacy of seed treatments in controlling *Zabrus tenebriodes* ranged 97.6-100%, whereas for spray application it was 76.2-94.5%. Efficacy of Cruiser in controlling *Zygnidia scutellaris* was 95.9%. No phytotoxic symptoms appeared on wheat, faba bean or corn.

P 21

A FIELD STUDY OF THE EFFECT OF INSECTICIDE "GAUCHO" ON APHID-INFESTED TOBACCO PLANTS. Fedaa Chamsin, Taufik Naser, Imad Ismail and Maher Masre, General organization of Tobacco, The Research Section, P.O. Box 3100, Lattakia, Syria, Email: kaisgazal@shufbc.com

The effect of the insecticide "Gaucho" on protecting tobacco plants from aphid infestation was studied. Tobacco seeds were dusted with Gaucho using two rates, 0.2 and 0.4 g/g (Gaucho/tobacco seeds). Two supplementary sprays of insecticide using the same rates were given to the tobacco plants, the first was one month after seedlings transplantation, and the second was one month later. Results obtained indicated that dusted tobacco seeds with the insecticide "Gaucho" (rates 0.2 and 0.4 g/g) protected tobacco seedlings from aphid infestation for two months compared with control treatment. Supplementary spray of tobacco plants with insecticide "Gaucho" (rate 0.2 g/g) reduced 80% of the number of aphids in comparison with the control treatment, but the reduction was higher when the rate 0.4 g/g was used.

P 22

COMPARATIVE BIOCHEMICAL CHANGES IN EXPOSED RATS TO CERTAIN PESTICIDES AT ABSENCE AND PRESENCE OF ATROPINE ANTIDOTE. Elsayed Ahmed Mohamed Abdallah¹, Yasser abobakr², Fahmy Ahmed Kassem¹, Ezat Amin Kadous¹ and Nasser Badway Sharkawy¹. (1) Pesticide Chemistry Department, Faculty of Agriculture, Alexandria University, Egypt; (2) Agricultural Animal Pests Department, Plant Protection Research Institute, ARC, Egypt, Email: elsayedabd2004@yahoo.com

Different groups of albino rats were exposed subcutaneously to sublethal doses of carbaryl, fenitrothion and deltamethrin as well as direct and delayed treatment by atropine antidote. The biochemical effect of such treatments were investigated on hemoglobin (Hb) concentration, hematocrite (Ht), red blood cells (RBC's), white blood cells (WBC's), creatinine concentration, urea concentration and acetylcholinesterase (AChE) activity. The results revealed that treatments with sublethal doses of either carbaryl, fenitrothion or deltamethrin caused non significant difference of the Hb value while delayed treatments with atropine increased significantly the Hb values of all tested insecticides. Both carbaryl and fenitrothion, insignificantly decreased the RBC's values. Deltamethrin increased the RBC's counts significantly, where the RBC's value increased from 3.05×10^6 to 4.44×10^6 for control and deltamethrin, respectively. Delayed treatments of atropine after subcutaneous administration of tested insecticides caused remarkable increase of the RBC's values. While fenitrothion treatments caused significant increase of WBC's counts (27.6%), in contrast to deltamethrin which exerted a significant decrease (27.1%) of the WBC's as compared to the control. Direct treatments of atropine abolished the drastic effects of both deltamethrin and fenitrothion, values of WBC's counts became all close to the control value. Delayed atropine treatments significantly increased the WBC's counts of all tested insecticides. Creatinine concentration was highly elevated due to treatments with all tested insecticides. The creatinine level was increased 200, 233 and 253% for carbaryl, fenitrothion and deltamethrin treatments, respectively. Urea concentration increased significantly by 164, 177 and 119 % for carbaryl, fenitrothion and deltamethrin respectively. The data revealed that both Carbaryl (carbamate) and Fenitrothion (organophosphorus) insecticides caused a marked inhibition of AChE activity; deltamethrin caused a non-significant attention of AChE activity, with 7.16% inhibition only.

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PESTICIDE RESIDUES AS AFFECTED BY THE CROP AND THE SPRAYING EQUIPMENT USED. Ahmed A. Sallam¹, Mostafa A. El-Tantawy² and Ibrahim M. El-Nabarawy³. (1) Plant Protection Department, Faculty of Agriculture, South valley University, Sohag, Egypt; (2) Plant Protection Department, Faculty of Agriculture, Zagazig University, Zagazig, Egypt; (3) Pests & Plant protection Department, National Research Centre, Dokki, Giza, Egypt, Email: asallam3@yahoo.com

The residues of the two organophosphorous insecticides, i.e. profenofos (Selecron 72 % E.C.) and pirimiphos-methyl (Actellic 50% E.C.) in and on tomato and squash fruits were determined. The effect of used spraying equipment (Back spray motor, Knapsack sprayer, and Ground spray motor) on the level of residues were also studied. The effect of washing and peeling processes in reducing the insecticides residues on treated fruits was also considered. The results showed that the deposit level of the two insecticides used were greatly affected by lipophilicity, the morphology and chemical composition of the outmost layers of the recipient surface of both fruits and the spraying equipment used. The initial amount of profenofos and pirimiphos-methyl on and in squash fruits were much higher than those of tomato, which reflect the higher capacity of squash fruits in the uptake of each of the two insecticides used as compared to tomato. The uptake of profenofos and pirimiphos-methyl onto the surface of tomato and squash fruits was higher when using back spray motor than with ground spray motor; while the knapsack sprayer occupied an intermediate position. In all cases, residues decreased progressively with time. The pattern of residues degradation was, however different in both fruits; squash fruits were able to degrade the insecticide residues faster than tomato fruits. The first five days were the most critical period at which the largest amount of residues were dissipated. Data also indicated that washing and peeling processes caused a significant reduction in the insecticide residues and varied in their efficiency of removing or eliminating residues. The safety period (days) after which profenofos sprayed tomato and squash fruits can be used for human consumption was 5.5 and 7days, respectively. The corresponding figures with pirimiphos-methyl were 7.8 and 2.3 days, respectively.

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DESIGN OF TRACTOR AIR PUMP EQUIPMENT FOR PESTICIDES APPLICATION UNDER SOIL SURFACE. Abdulrazzak Abdullatif Jasim, Department of Mechanized Agriculture, Ministry of Higher Education and Scientific Research, College of Agriculture, University of Baghdad, Iraq, Email: raz55iq@yahoo.com

There are different spray pumps to spray agrochemicals such as a liquid fertilizer and pesticides. However, most of these equipments are designed to apply materials above soil surface and plant, not under soil surface. New equipment designed to spray or inject agrochemicals under soil surface depend on tractor's air pump. The designed equipment consists of a tank sitting on the plow frame connected through a plastic tube and aluminum tube to the plow's wings and nozzles. This equipment is connected with the tractor's air pump to supply the system with the desired pressure for spray or inject liquids. The designed equipment can also spray liquid fertilizers or any other solution after adjusting the nozzles diameter.

P 25

A DATA BANK FOR PESTICIDES IN ALGERIA. Yamina Tchoulak Dahoun, K.M. Moussaoui and L. Abdelouael, Sciences and Technics of Environment Laboratory, Ecole Nationale Polytechnique, 10 Avenue Hassen Badi, El Harrach, Algeria, Email: tchoulak_1999@yahoo.fr

Pesticides are used in agriculture for the protection and conservation of crops. However, their toxicity can generate harmful impact in the environment and health, especially if the requirements for their use are not observed. In Algeria, scarce data exist on the use of the pesticides and their environmental impacts, and often information is not centralized. This lack of technical and scientific data endangers environment and health. The data information systems or "data banks" allow fast and easy consultation of complex and varied information for a correct use, which can reduce the risk of using these products. For this purpose, it was essential, within the framework of our research task, to make an inventory on the use of the pesticides in Algeria. Contacts and investigations were made with the various organizations concerned with pesticides in Algeria, and with farmers and retailers. Collected information on diseases, regulations in force, pesticides most used in Algeria, storage conditions and marketing, precautions for pesticides use, and toxicity. The data obtained was stored in a data bank which is also available in the form of "CD-ROM" created for the various pesticides users.

Plant Extracts

EX 1

THE EFFECTS OF PYRROLIZIDINE ALKALOIDS OF *IBICELLA LUTEA* (STAPF.) VAN ESLET (MYRTYNACEAE) ON THE BIOLOGICAL PERFORMANCE OF *BEMISIA TABACI* (GENN.) (HOMOPTERA: ALEYRODIDAE). Nasir Al-Mansour¹, Fawzi Al-Zubaidi² and Shaimaa Al-Ubaidi³. (1) Department of Biology, College of Science, Basrah University, Iraq; (2) Department of Biology, College of Science, Baghdad University, Iraq; (3) Medical College, Babylon University, Iraq, Email: honeyqueen_fs@yahoo.com

The Pyrrolizidine alkaloids extracted from *Ibicella lutea* were evaluated on some biological criteria of whitefly *Bemisia tabaci*. The mortality rate was severely affected by those compounds; it reached 100% at concentrations of 1 and 2%. Three different major bands of pyrrolizidine alkaloids were separated by T.L.C. technique. The separated bands seem to have strong effects on the mortality rate of all development stages of whitefly which reached 100, 66.6 and 59.3% in the first, second and third larval instar, respectively, for band No. 1; and 83.6, 57.6 and 46.6% of the third larval instar, respectively when band No. 2 was tested. The mortality rate was 7.3, 4.3 and 2.6%, respectively with band No. 3. The mortality rate of pupal stage was affected also, and reached 42.3, 33.6 and 2.0% when using bands No. 1, 2 and 3, respectively. The adult mortality rate was 87.0, 80.3 and 22.3% when bands No. 1, 2 and 3 were tested. Egg mortality rate was 66.0, 62.37 and 4.6% with bands No. 1, 2 and 3, respectively. The chemical and physical characters of three bands were studied.

EX 2

EFFECTS OF UNICORN PLANT *IBICELLA LUTEA* (STAPH.) VAN ESLET. (MARTYNEACEAE) PHENOLIC COMPOUNDS ON SOME BIOLOGICAL ASPECTS OF *BEMISIA TABACI* (GENN.). Fawzi S. Al-Zubaidi, Biology Department, College of Science, Baghdad University, Baghdad, Iraq, Email: Fawzi_alzubaidi@yahoo.com

Phenolic compounds were extracted from *Ibicella lutea* leaves. The mortality rate of *Bemisia tabaci* was severely affected by those compounds, and reached 100% at concentrations of 1.0 and 2.0%. The cumulative mortality was also affected and reached 100% at the same concentrations. The developmental period was increased by the extracted compounds; it reached 22.1 days at concentration of 0.5%, while it was 12 days with the control. The major bands of phenolic compounds were separated by the thin layer chromatography technique. The separated compounds affected the mortality rate of all developmental stages of *B. tabaci*, and ranged between 27.3 to 38.3% in the 1st larval instar, 21.3 to 30.0% for the 2nd larval instar, and from 17.6 to 29.3 for the 3rd larval instar when treated with bands No. 1, 2, and 3, respectively. Egg hatchability was 24.3 to 33.3% when treated with separated compounds, and adult mortality reached 52.6%. Study findings suggested that the extracted phenolic compounds seem to have synergistic effects on the mortality rate of the whitefly *B. tabaci*.

EX 3

TOXICOLOGICAL AND PHYTOCHEMICAL STUDIES OF WILD PLANT, *HALOCNEMON STROBILACIUM* CRUDE EXTRACTS AND THEIR COMPONENTS AGAINST *APHIS CRACCIVORA* KOCH. Samira A. H. Abdallah¹, Hany M.A. Badawy², Ahmed A. Barakat² and Mahmoud M.M. Soliman¹. (1) Pests and Plant Protection Department, National Research Center, Cairo, Egypt; (2) Economic Entomology and Pesticides Department, Faculty of Agriculture, Cairo University, Egypt, Email: solim_nrc@yahoo.com

Toxicological and phytochemical studies were conducted on *Halocnemon strobilacium*. Results indicated that the crude extract with LC₅₀ value of 0.159 mg/cm² and LC₉₅ value of 1.845 mg/cm² was the most effective against *Aphis craccivora* compared with the fraction A (LC₅₀ 1.299 mg/cm² and LC₉₅ 3.899 mg/cm²) as well as fraction B (LC₅₀ 1.522 and LC₉₅ 4.721 mg/cm²). Data also showed that the crude extract was composed mainly of saturated and unsaturated fatty acids and their esters (68.99%), followed by hydrocarbons (9.61%). Only two terpenes were identified in this crude extract, a phytol isomer and a diterpene detected at 2.26%. Oleic acid ester (38.18%) and Octadecanoic acid (16.4%) were the major constituents. α -Amyrin was detected in the crude extract. The main compounds in fraction A, hydrocarbons fatty acid and their esters. Lumiflavine represented about 35.66% and being in such a high percentage explains the medicinal and domestic uses of *Halocnemon strobilacium*. Five fatty acid and esters were

identified and constituted 39% with Oleic acid ester (14.70%), Octadecanoic acid methyl ester (4.40%) and Tetradecanoic acid (3.88%) being the major components. In fraction B, twenty-four compounds were identified. Unxygenated compounds amount to 9.89, the main hydrocarbons being dimethyl undecane (5.202%) and trimethyldecane (5.01%). Oxygenated compounds constitute 90.11% of the fraction comprising fatty acids and esters, ketones as well as aldehydes (46.08%, 17.94% and 3.29% of the fraction, respectively). The main ester identified was octadecanoic acid methyl ester (6.44%), while hexadecanoic acid was the main fatty acid detected (22.69%).

EX 4

EFFICACY OF SOME PLANT EXTRACTS ON MEDITERRANEAN FRUIT FLY *CERATITIS CAPITATA* (WIED) AND EFFECT OF PHOTOPERIOD ON ITS BIOLOGY AT DIFFERENT STAGES. Rafea A. Arbab and Omran A. Abo Salah, Faculty of Agriculture, Omar Omar Al-Mukhtar fUniversity, Al-Bieda, Libya, Email: Cat_ra2005@yahoo.com

Efficacy of four plant extracts from leaves and flowers of *Thymus capitatus*, *Allium sativum*, *Artemisia herba-abla* and *Salvia fruticosa* on larvae of the Mediterranean fruit fly, *Ceratitis capitata* (Wied), was tested. Larvae-mortality rates varied according to the plant species, concentration and exposure period. Among the tested extracts, *A. sativum* was the most efficient followed by *T. vulgaris*, *A. herba-abla* and *S. fruticosa*, respectively. The same effect was found on adults, in addition to inhibition of egg laying. The effect of three photoperiods, continuous light, alternate light and Darkness on the biology of the different stages of the Mediterranean fruit fly was investigated under constant laboratory conditions of $23 \pm 2^\circ\text{C}$ and 70% RH. Results showed that continuous light had significant negative effect on egg laying and longevity of the insect, whereas, alternate light was more suitable for the biology of the insect, and led to normal egg-laying and low mortality.

EX 5

EFFECT OF SOME NEEM PRODUCTS (*AZADIRACHTA INDICA* A. JUSS) ON GROWTH AND DEVELOPMENT OF THE BEET ARMYWORM (*SPODOPTERA EXIGUA* HUBNER). Muneef Abid Mustafa and Zuhair Mohammad Al-Sharook, Faculty of Science, Mousl University, Mousl, Iraq, Email: mabid2005@yahoo.com

This study was carried out to evaluate the effect of neem products *Azadirachta indica* A. Juss on growth and development of *Spodoptera exigua* Hüb. on artificial diet under incubator conditions. The results showed that Sadao thai 111, Azadirachtin - A, Nemec super and Neem oil significantly reduced the larval and pupal weight. The EC_{50} obtained was 0.47, 0.48, 1.0 and 1.9 ppm, respectively. The results indicated that the mortality rate of beet armyworm larvae increased with the application of higher concentrations of Sadao thai 111, Azadirachtin -A, Nemec super and Neem oil, with LC_{50} of 0.5, 0.6, 1.1 and 3.2 ppm, respectively. Morphological abnormalities in different stages were observed.

EX 6

THE SENSILLA OF *Aedes aegypti* AND *Anopheles stephensi* MOSQUITOES AND THEIR IMPORTANCE IN REPELLENCE. Abdelkrim Amer¹ and Heinz Mehlhorn² (1) Omar Almukhtar University P. O. Box 919 Elbieda, Libya, Email: a_m_amer@yahoo.com; (2) Department of Zoology, Cell biology and Parasitology at Heinrich Heine University, Düsseldorf, Germany, Email: mehlhorn@uni-duesseldorf.de

The aim of this study was to identify the role of some mosquito organs in the sensation of repellent materials. A total of 250 females (15 days old) of the target species *Aedes aegypti* and *Anopheles stephensi*, were prepared and divided into five groups (without antenna; without maxillary palps; without proboscis; without front tarsus; and normal females as control). A mixture of five oils containing extracts of *Litsea cubeba* 1%, *Melaleuca leucadendron* 1%, *Melaleuca quinquenervia* 1%, *Viola odorata* 1%, *Nepeta cataria* 1% was included in a complex solvent containing 20% genapol, 10% polyethylene glycol (PEG), 20% ethanol and 50% water. Furthermore, Bayrepel was used in this experiment at a 20% concentration in the same solvent, and pure water was used as control. The test was carried out by spraying 100 μl of the repellent material or water on a 30cm² exposure area of a human volunteers arm. In *Aedes aegypti* the biting and landing rates increased significantly in those mosquito groups that lacked some organs (especially

maxillary bulbs), while in *Anopheles stephensi* it was not clear which organ is responsible for perception of repellents.

EX 7

REPELLENCY EFFECT OF ESSENTIAL OILS AGAINST THREE MOSQUITO SPECIES (*Aedes*, *Anopheles* AND *Culex*). Abdelkrim Amer¹ and Heinz Mehlhorn². (1) Omar Almkhtar University, P.O. Box 919, El-Bieda, Libya, Email: a_m_amer@yahoo.com; (2) Department of Zoology, Cell Biology and Parasitology at Heinrich Heine University, Düsseldorf, German, Email: mehlhorn@uni-duesseldorf.de

Since ancient times plant products were used in many ways. However, their use against pests decreased, when chemical products were developed. Recently, public health and environmental safety concerns encouraged the use of natural products against insect pests. In this study 41 plant extracts and 11 oil mixtures were evaluated against the yellow Fever mosquito (*Aedes aegypti* Linnaeus), the malaria vector (*Anopheles stephensi* Liston) and the filariasis and encephalitis vector (*Culex quinquefasciatus* Say) (Diptera: Culicidae) using the skin of human volunteers to find out the protection time and repellency. The five most effective oils were those of Litsea (*Litsea cubeba*), Cajeput (*Melaleuca leucadendron*), Niaouli (*Melaleuca quinquenervia*), Violet (*Viola odorata*), and Catnip (*Nepeta cataria*), which induced a protection time of 8 hours at the maximum and a 100% repellency against all three species. This effect needs, however, a specific formulation to fix them on the human skin.

EX 8

LARVICIDAL EFFECTS OF VARIOUS ESSENTIAL OILS AGAINST *Aedes*, *Anopheles*, AND *Culex* LARVAE. Abdelkrim Amer¹ and Heinz Mehlhorn². (1) Omar Almkhtar University, P.O. Box 919, El-Bieda, Libya, Email: a_m_amer@yahoo.com; (2) Department of Zoology, Cell biology and Parasitology at Heinrich Heine University, Düsseldorf, Germany, Email: mehlhorn@uni-duesseldorf.de

The larval stages of mosquitoes are attractive targets, since they breed in water, and thus are easy to reach them there. The use of conventional pesticides in the water sources, however, introduces many risks for people and/or environment. The natural pesticides, especially those that are derived from plants, are more promising for this purpose. In this study, oils of 41 plants were evaluated against 3rd instar larvae of *Aedes aegypti*, *Anopheles stephensi* and *Culex quinquefasciatus*. At first the oils were used against *Aedes aegypti* using a 50 ppm solution. Thirteen oils (camphor, thyme, amyris, lemon, cedarwood, frankincense, dill, myrtle, juniper, black pepper, verbena, helichrysum, sandalwood) induced 100% mortality after 24 hours or even less. The best performing oils were tested against 3rd instar larvae of the three mosquito species in following concentrations: 1, 10, 50, 100 and 500 ppm. The LC₅₀ values of these oils ranged between 1-101.3 ppm against *Aedes aegypti*, between 9.7-101.4 ppm for *Anopheles stephensi* and between 1-50.2 ppm for *Culex quinquefasciatus*.

EX 9

TOXIC EFFECT OF SOME SAP AND HEARTWOOD CHEMICAL COMPOUNDS OF SOME FOREST TREES ON TERMITE. Nizar Mustafa Al-Mallah, Walid Aboudi Kasur and Shahin Abbas Mustafa, Plant Protection Department, Faculty of Agriculture and Forest, Mousel University, Iraq, Email: e_madk@maktoob.com, shahinkifre@yahoo.com

The results of the toxic effect of phenols, terpenes, alkaloids, oils and water extracts of sap and heartwood of *Platanus orientalis*, *Populus nigra*, *Cupressus sempervirens*, *Pinus britia*, *Salix acomphylla* and *Eucalyptus camaldulensis* on termite workers showed a significant variation in toxicity according to the type of compound, type of wood and tree species. The extraction of phenols, terpenes oil and water of both sap and heartwoods of *P. britia* were more toxic to termite than the other compounds. The alkaloids extract of heartwood of *P. britia* and *P. orientalis* and sapwood of eucalyptus camaldulensis showed high toxicity to termite workers, with LC₅₀ values 0.045, 0.045, and 0.040%, respectively.

EX 10

THE EFFICACY OF PLANT EXTRACTS AS INSECT REPELLENT AND ANTI- OVIPOSITION AGAINST COWPEA WEEVIL, *CALLOSBRUCHUS MACULATUS* FAB. ON CHICKPEA SEEDS.

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Plant extract of chinaberry, thyme, fennel, garlic, cumin, dill, pepper, and camphor for their repellency and anti- oviposition of Cowpea weevil, *Callosobruchus maculatus* (Coleoptera: Bruchidae). Ethanol extract of dill and cumin seeds at 2% concentration gave the highest repellency rate (100 and 99.6%), followed by garlic (65.4%), chinaberry (93.3%) and fennel (92.6%), while the lowest rate (90%) was observed for pepper extract. However, ethanol extract of plants at 1% concentration caused 95.7% and 94.4% repellency for dill and cumin extracts followed by Garlic (88%), whereas the lowest rate (38.1%) was observed for pepper extract. When ethanol extract was used at 0.5% concentration, the highest rate of repellency (90.3%) was obtained for dill, *Anethum graveolens* L. extract, and the lowest rate of repellency (44.4 and 28.6%) was observed for chinaberry and pepper extracts.

EX 11

EFFECT OF PLANT EXTRACTS OF *EUCALYPTUS GOMPHOCEPHALA*, *SCHINUS MOLLE* AND *MELIA AZEDARACH* ON *SCHISTOCERCA GREGARIA* (FORSKÅL, 1775) (INSECTA-ORTHOPTERA) UNDER LABORATORY CONDITIONS. A. Guendouz-Benrima¹ and B. Doumandji-Mitiche².

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This study evaluated the effect of extracts from foliage of *Schinus molle*, *Eucalyptus gomphocephala* and *Melia azedarach* on adults of the desert locust *Schistocerca gregaria*. When extracts were injected in the locust, a 100% mortality was obtained with the *Schinus molle*, four days after treatment while with *Eucalyptus gomphocephala* and *Melia azedarach* extracts, an anti-appetite effect was noticed and a delay in oviposition due to the action of a protein fraction leading to a blockade of the egg laying process. When solutions of plant extracts were sprayed on the foliage of *Trifolium alexandrenum*, 80% mortality was obtained 20 days after treatment. The anti-appetite and delay in oviposition effects of *Eucalyptus gomphocephala* and *Melia azedarach* sprays were also noticed on females.

EX 12

EFFICIENCY OF DIFFERENT CONCENTRATION OF NEEM OIL AGAINST JASMINE WHITEFLY (*ALEUROCLAVA JASMINI*) ON CITRUS TREES. Hussain A. Taha, Muntaha S. Hussan, Wafaa H. Saleh and Ro'aa Th. Thamer, State Board for Agriculture Research, Baghdad, Iraq, Email: hu_alani@yahoo.co.uk

The efficiency of three concentrations of neem oil (1, 2 and 4 ml/l water) against *Aleuroclava jasmine* on citrus trees was evaluated. Results showed that concentration 4 ml/l water was highly effective against whitefly eggs. The mortalities rates were 91.3, 98.0, 65.0, 54.5 and 13.7% after 4, 6, 10, 15 and 20 days, respectively, whereas they were 56.6, 96.3, 79.1, 50.4 and 41.9 % against nymphs at the same periods. The two lower concentrations (1 and 2 ml/l water) were effective for 10 days with mortality rates of 35.8 and 63.8% for eggs and 19.7 and 72.6 % for nymphs, for the two concentrations, respectively. The results obtained indicated that the concentration of 4 ml/l water could offer adequate protection for three weeks, after which another application can be made if needed.

EX 13

IMPACT OF DIFFERENT APPLICATIONS OF A NATURAL PESTICIDE (NEEM) IN CONTROLLING INSECT PESTS UNDER LABORATORY AND FIELD CONDITIONS. Ali Abdulla Omer Baoum¹ and Abdul Kader M. Bin Othman².

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Several field and laboratory trials were carried out at Elkod Agriculture Research Station and at Food Research and Post-harvest Technology Center, Yemen in an attempt to determine the effect of several concentrations of neem extract (seed oil and grinded leaves) against certain insect pests. The target pests

included thrips (*Thrips tabaci*) on onion, whitefly (*Bemisia tabaci*) on tomato, cowpea beetle (*Callosobruchus maculatus*) on cowpea and *Rhizopertha dominica* on sorghum. The neem oil was applied at 5, 10 and 15 ml/l water in the field trials on both tomato and onion for the control of whitefly and thrips. The results showed that 15 ml/l. of water was superior and differed significantly at $P=0.05$, to minimize infestation compared to control under laboratory conditions. Neem was applied as oil for control of cowpea beetle by seed dressing at concentrations of 3, 5 and 10 ml/kg of seed and as grinded neem leaves at concentration of 5, 10, 15 and 20 g/kg seeds. Another trial involved application of grinded neem leaves for the control of *Rhizopertha dominica* in sorghum at concentrations of 5, 10, 15 and 20 g/kg seeds. The results revealed effective control with higher concentration compared to control. The control with neem oil was the best compared with grinded leaf extract.

EX 14

NEMATICIDAL ACTIVITY OF SOME PLANT LEAF EXTRACTS AGAINST *MELOIDOGYNE INCOGNITA*. Samirah Salamy and A. Mazrkat, Botany Department, National Institute of Agricultural Sciences, Al-Harash 16200, Algeria, Email: hamsella@yahoo.fr

Nematicidal activity of leaf extracts of six plant species (*Ocimum basilicum*, *Thymus algeriensis*, *Origanum floribundum*, *Rosmarinus officinalis*, *Coriandrum sativum*, and *Ruta graveolens*) against eggs and second stage juveniles of *M. incognita* was evaluated *in vitro*. Results showed that plant extracts had different effects on egg hatching and larval mortality of *M. incognita*. However, inhibition of hatching and percentage of larval mortality increased as concentration and exposure time of plant extracts increased. Leaf extract of *Coriandrum sativum* caused 100% larval mortality.

EX 15

EFFECT OF AQUEOUS EXTRACTS OF NEEM (*MELIA AZADARACH*) AND OLEANDER (*NERIUM OLEANDER*) ON CALLUS CULTURES OF SUNFLOWER (*HELIANTHUS ANNUUS*) INFECTED WITH ROOT-KNOT NEMATODE. Hana S. Al-Saleh, Hussien I. Artin and Azhar H. Ali, Biology Department College of Science, Mosul University, Iraq, Email: hanasa59@yahoo.com; ammaraltaee1978@yahoo.com

The effect of aqueous extracts of neem (*M. azadarach*) and oleander (*N. oleander*) on callus cultures initiated from sunflower (*H. annuus*) seedlings and infected with root-knot nematodes (*Meloidogyne* spp.) was studied. Morphological features of callus were determined, along with chemical measurements of protein, carbohydrate and nucleic acids in the callus tissue. Results showed that Neem and oleander extracts at 1.5 and 2.5 mg/ml, respectively, in culture medium were effective in stimulating callus growth, and reduced number of root-knot nematodes, eggs and egg masses.

EX 16

INFLUENCE OF SOME EXTRACTS AND ADDITIVES OF MARIGOLD PLANTS (*TAGETES* SPP.) ON ROOT-KNOT NEMATODES (*MELOIDOGYNE* SPP.) OF TOMATO PLANTS UNDER GREENHOUSE CONDITIONS IN THE SYRIAN COAST. F. Farawati, A. Hider, M. Albalkhi, M. Attiah, M. Salman and G. Zeeni, Scientific Agriculture Research Center in Lattakia, Bouka, Lattakia, Syria. Email: frwfai88@scs-net.org

Field experiments were carried out at Snober Research Station, Lattakia during 2004-2005 to study the efficacy of extracts and additives of marigold plants (*Tagetes* spp.) on the root-knot nematodes (*Meloidogyne* spp.) on tomato under greenhouse conditions in the Syrian coast. Different treatments of marigold seedlings were tested: (i) space between tomato and marigold seedlings (8 inches apart), (ii) addition of cutting of complete marigold seedlings to the soil of tomato plants (1:1), (iii) addition of cuttings of marigold roots to the soil of tomato plants, (iv) addition of cutting of marigold foliage to the soil of tomato plants, (v) spraying root tomato plants with flower extracts of marigold seedlings, (vi) spraying tomato plants with root extracts of entire marigold seedlings, (vii) spraying tomato plants with leaf extracts of marigold seedlings. Results showed high efficacy of the treatments ii, iii and iv reaching 100% as compared to control; whereas other treatments did not show significant differences compared to the controls, but reduced nematodes population density by 60-65 % in soil samples, and root galling by 70-75% compared to controls. However, treatment (i) was highly effective (100%) during the first month and

escaped nematodes attack. Good results were achieved by using safe alternatives to chemical nematicides which has positive impact on the environment.

EX 17

ANTIMICROBIAL EFFECT OF SOME PLANT EXTRACTS ON FORMATION OF CROWN GALLS CAUSED BY *AGROBACTERIUM TUMEFACIENS* ON PEA SEEDLINGS Najwa Ibraheem Al-Barhawe, Education College, Biology Department, Mosul University, Iraq, Email: dr_najwa2000@yahoo.com

The results of present study showed that the antimicrobial effects of leaves extracts of *Eucalyptus camaldulensis*, *Myrtus communis* and *Runica grantum* on growth of *A. tumefaciens* and its ability to produce the crown galls on hypocotyls of pea seedlings (*Pisum sativum* L) were varied when they were added to the nutrient media. The diameters of inhibition zone around the *A. tumefaciens* colonies on nutrient agar containing these extracts were assessed, since they were 22, 13 and 12 mm, respectively. The numbers of crown galls on hypocotyls of pea seedlings were reduced from 6 to 1, 2 and 4 galls / 6 wounds, the percentages of infection were also reduced from 95% to 15,13 and 75%, respectively, when the hypocotyls segments were cultured on free agar solidified MS medium or supplemented with these extracts. Results indicated that nodules on the roots of pea seedlings were formed, 7 days after infection with *A. tumefaciens* and then inoculation by *Rhizobium leguminosarum* biovar *vicia* using nitrogen free agar solidified medium which was supplemented with the above extracts as compared to the control treatment.

EX 18

THE STUDY OF INHIBITORY EFFECT OF DIFFERENT TYPES OF POTATO INFECTED BY *ERWINIA* STRAINS USING DIFFERENT BIOLOGICAL AGENTS. Rawdha M.A. Shareef, M. Al-Ramadan, Khawla A.M.M. Al-Flaych and Adeeba Y.Sh. Hammo Al-Nomaan, Department of Biology, College of Science, University of Mosul, Mousel, Iraq, Email: drsarabalshamaa@yahoo.com

Powdered leaf of *Eucalyptus camaldulensis*, *Apium graveolens* and the dry powdered fruits of *Citrullus colocynthis*, *Melia azedarach*, *Prosopis fascta* used as biological inhibitors to prevent the lysis of potato tissues infected with different strains of *Erwinia*. The dry powder of *Eucalyptus camaldulensis* leaves showed a higher inhibitory effect for the lysis of potato slices (56.1-100%) compared to the control, whereas the dry *Apium graveolens* leaves inhibited the lysis at a rate of 38.6-100% compared to the control. Dry powder of *Melia azedarach* fruits inhibited the lysis of potato slices at a rate of 23.2-99.2%. *Citrullus colocynthis* showed different effects on different kinds of potato. It showed an inhibitory effect for the Billini, Columbus, Desirre and Recolta at a rate of 17.5-77.1% compared to the control, whereas it showed stimulatory effect for the lysis of Ajiba tissue at a rate ranging between 7.4 and 25.5%. The dry powder of *Prosopis farcta* fruits showed an inhibitory effect on the lysis of potato tissue at a rate of 27.5-50%, while it showed a stimulatory effect at a rate of 0.6-66.4% in comparison with the control.

EX 19

RESPONSE OF SOME FUNGAL PATHOGENS ASSOCIATED WITH GRAPE FRUITS IN STORAGE TO POWDERS OF SOME PLANT PARTS. Saba B. Al- Juboory¹, Kamil S. Juber¹ and Adnan I. Al-Samaraay². (1) Plant Protection Department, College of Agriculture, University of Baghdad, Abu Ghraib, Baghdad, Iraq; (2) Ministry of Science and Technology, Baghdad, Iraq, Email: wisam_ali2004@yahoo.com

This study was carried out at the College of Agriculture, University of Baghdad to determine the response of some fungi associated with grape fruits in storage, to powders of pomegranates peels (*Punica granatum* L.), cauliflower (*Brassica oleracea* var. *botrytis*), or spearmint (*Mentha logifolia* L.) leaves when added to PDA medium under laboratory conditions. Results showed that efficacies of the plant powders used to inhibit growth of some fungi varied, according to the fungus species. The highest inhibitory effect on growth of all tested fungi was achieved by the application of pomegranate peels powder, its efficacy against *Alternaria alternata* reached 100%, followed by spearmint and cauliflower leaves powders, with an inhibitory effect against *A. alternata* of 77.12 and 82.00%, respectively. The lowest inhibitory effect recorded by the application of all tested powders was against *A. niger*.

EX 20

ANTIFUNGAL EFFECTS OF CITRUS LEAF AND FRUIT EXTRACTS ON GROWTH RATE AND SPORES GERMINATION OF PATHOGENIC *ALTERNARIA* SPP. Abbas Ali Dehpour¹, A. Majd², V. Alavi³ and F. Falahian⁴. (1) Department of Biology of Islamic Azad University Ghamshare Branch of Iran; (2) Department Biology of Tehran Shomal Azad University; (3) Mazandran Gahad & Agriacultur Reseach Center; (4) Department Biology of Research and Science Azad University Tehran, Iran. Email: adehpour@yahoo.com

Alternaria has different species inducing several plant diseases can produce, toxic and carecenogenic substances, and produce allergic and respiratory disorders. *Alternaria* species are also well known as post-harvest pathogens on citrus. The most common two species pathogenic to citrus are *Alternaria citri* and *Alternaria alternata* pv *citri*, the causal agents of fruits black rot and brown spot. High economical losses by *Alternaria* were observed in the Northern part of Iran. The objectives of this study were to increase our knowledge on fungi morphological features and the antifungal effects of citrus fruits and leaves extracts on spore germination and growth rate of *Alternaria* spp. Several isolates of *Alternaria* were collected from different areas and pure cultures were prepared on potato dextrose agar (PDA). Mycelium growth was measured at different temperatures. Leaf and fruit extracts in methanol were evaluated as inhibitors to fungal growth. Spores of different isolates were injected into immature healthy fruit and symptoms progress was recorded under in-vitro as well as natural conditions. The results obtained indicated that morphological traits of spores in both isolates were identical. The optimum temperature for mycelium growth was 25°C. Colonies were different in color, density and thickness. The albedo part of the fruit was the main site of penetration and infection. Fruit skin, especially that of immature fruits, was completely resistant, since the fungal mycelium could not penetrate it. Spores injection induced the development of both soft and dry rots. Methanol extracts of Thomson Navel inhibited mycelium growth rate, and affected vegetative growth. Water extracts of skin and immature Thomson navel fruits did not affect spores germination and mycelial growth.

EX 21

EFFECT OF PHENOLIC COMPOUNDS EXTRACTED FROM LEAVES AND CALLUS OF DIANTHUS CARYOPHYLLUS ON GROWTH OF *FUSARIUM OXYSPORUM* AND *FUSARIUM CULMORUM*. Khazl Ali Ameen and Firas Hameed Khuthayer, Biology Department, Education College, University of Mosul, Iraq, Email: nadeemramadan@yahoo.com

This study was carried out to evaluate the effect of some plant growth regulators in inducing, growth and regeneration of callus of *Dianthus caryophyllus*. The result showed differences in callus induction from different parts of the plant (stem, leaves cotyledons, root and hypocotyls) after adding different concentrations of 2,4-D + BA and IAA + BA. The best concentration for high rate of callus induction was BA 0.1 mg/l and 2,4 - D 0.5 mg/l. Elimination of *Fusarium oxysporum* and *Fusarium culmorum* fungi was achieved by using the crude alcohol extracts that contain leaf phenolic compounds obtained from seeds, leaf callus and leaves resulted from callus regeneration. The alcoholic extract from leaves callus had the best inhibition effect on growth of fungi with an inhibition rate of 67%.

EX 22

EFFECT OF SOME CRUDE PLANT EXTRACTS AND OILS IN CONTROLLING CUCUMBER POWDERY MILDEW (*SPHAEROTHECA FULIGINEA*) UNDER COMMERCIAL PROTECTED HOUSES. A.M.M. Mahdy, M.H. Abd El-Mageed, Faten Abd M. Abdelel-Latif and G.M. Ashour, Agriculture Botany Department, Faculty of Agriculture, Benha University, Egypt, Email: abdou_mahdy@hotmail.com

Two experiments were carried out during the 2003 spring and autumn seasons. In the first season, the effects of some plant extracts and oils on conidia germination of *Sphaerotheca fuliginea*, causal agent of cucumber powdery mildew were studied under laboratory conditions. In the second season, three groups of cucumber plants cv. Primo (4 weeks old) were grown under commercial protected houses. First group was sprayed with the aqueous extracts of garlic (*Allium sativum*) at concentration 5, 10 and 20%, clove (*Syzygium aromaticum*) at 2.5, 5 and 10% and withania (*Withania somniferum*) at 12.5, 25 and 50.0%. Second group was sprayed with suspension of four essential oils of cloves (*Syzygium aromaticum*) at 2.5, 5

and 10%, or nigella (*Nigella sativa*), or olive (*Olea europaea*) or rocket (*Eruca sativa*) at 2, 4 and 8%. Third group (control treatments) was sprayed with tap water or Topas fungicide at rate 12.5, 25 and 50 ml/100 l. Marked reduction in the conidial germination and in disease incidence and its severity were achieved by increasing the concentration of all tested plant extracts and essential oils.

EX 23

THE USE OF SOME PLANT EXTRACTS FOR CONTROLLING POWDERY MILDEW DISEASE ON CUCUMBER IN AL-BEIDA REGION-LIBYA. Younis M. Bader, Issa A. Abougarsa and Mahmoud E. Ehwaetil, Plant Protection Department, College of Agriculture, Omar Al-Mukhtar University, P.O. Box 919, Al-Beida, Libya, Email: aasa2080@yahoo.com, goody3cot@yahoo.com

Four plant extracts; Garlic, Rosmary, Thyme, and Mustard were used to control powdery mildew *Spherotheca fulginea* on cucumber. The plants were treated before or after inoculation Results showed that application of these extracts before or after inoculation gave significant disease control on cucumber compared with check. The best result was achieved by the application of mustard and garlic extracts before inoculation, with a mean disease incidence of 6.6 and 7.7%, respectively. The thyme extract gave lowest efficacy, with an average disease incidence of 22.8%. These extracts were effective during the first three weeks after inoculation. The mustard extract was the most effective, leading to an average disease incidence of 7.7%, with significant differences observed in comparison with other treatments. The least effective was the thyme extract, with an average disease incidence of 25.1%.

EX 24

EFFECT OF OILS EXTRACTED FROM NIGELLA SATIVA L. SEEDS AND SOME TERPEN COMPOUNDS ON MAUGINIELLA SCAETTAE SPORE GERMINATION. Abdellaziz Taxenna and Nouredine Belattar, Department of Biology, Faculty of Sciences, Ferhat Abbes University, Sétif 19000, Algeria, Email: taxenna@yahoo.fr

The chemical control of pathogenic fungi by fungicide causes serious ecological and health problems. The aims of this study was to investigate the inhibitory effect of oils extracted from seeds and some terpen compounds on spore germination of *Mauginiella scaettae*, responsible of inflorescence rot of date palm. Evaluation of this inhibition was achieved by disc technique on malt extract agar. Mac Farland method was used for determining inoculum concentration (10^8 cells/ml). The discs put on the inoculated medium were impregnated by tested oil samples. The results showed that the fixed oil of *Nigella sativa* L. seeds at 1mg/disc has a weak inhibition zone of 12mm diameter. However essential oil at 125 µg/disc an total inhibition zone of with 90 mm diameter. The same result was obtained by carvacrol but with a higher concentration (1035µg/disc). On the other hand, thymoquinone at 43.5 µg/disc gave an inhibition zone with a diameter of 32mm. Finally, hydrocarbon terpenes such as α-pinene and p-cymene did not have an effect on spore germination.

EX 25

CONTROL OF FUSARIUM WILT FUNGUS ON TOMATO PLANT BY PLANT EXTRACTS. Issa Ali Abogharsa¹, Mohamed Ali Saeed¹ and Mohamed Salem Buhidma². (1) Faculty of Agriculture, Omar Al-Mukhtar University, El-Bida, Libya; (2) Agriculture Ministry, P.O.Box 390, El-Bida, Libya, Email: msbuhidma@hotmail.com

Fusarium oxysporum f.sp *lycopersici* is a major fungal pest of tomato crop in the Mediterranean coastal area, particularly in the Green mountain district in Libya. Infection with this fungus significantly reduced the crop yield and quality. Several plant extracts were found to be highly effective on different isolates of fusarium wilt in the laboratory, and were tested with other control methods on two tomato varieties (Marco and plaza) artificially inoculated with the fusarium wilt fungus. Results showed that these extracts reduced wilt infection rate 49 days after planting on both tested varieties. The most effective treatment after the fungicide Tachigaren was garlic extract.

EX 26

ALLELOPATHIC EFFECT OF CITRUS TREES ON SOME SOIL FUNGI. Ganan A. Saeed and N.A. Ramadan, Biology Department, College of Science, Mosul University, Iraq, Email: nadeemramadan@yahoo.com

The research dealt studying the effect of some *citrus* leaf extracts and leachates of orange, lemon, naranj and grape fruit on the number of fungi found in the soils under these trees which included *Rhizoctonia solani*, *Fusarium Stemphyllium* spp., *Macrophomina* spp., *Aspergillus* spp. and *Penicillium* spp. The results showed differences in the allelopathic effect of citrus extracts and leachates and their concentrations (2, 4, 6, 8, 10%) which increased with the increase in concentration. An increase in *Aspergillus* spp. and *Penicillium* spp. and reduction in *Rhizoctonia solani* and *Fusarium* spp. population was observed. The addition of *citrus* leaves to the soil caused an increase in the population of some fungi and decrease in others.

EX 27

EFFECT OF SOME ESSENTIAL OIL AND PLANTS EXTRACT ON CONTROLLING BOTRYTIS ALLII THE CAUSAL PATHOGEN OF ONION NECK ROT DISEASE. Heidi I.G. Abo-Elnaga¹ and Naglaa G. Ahmed². (1) Department of Plant Pathology, Faculty of Agriculture, Assiut University, Assiut, Egypt; (2) Plant Pathology Agricultural Research Center, Giza, Egypt.

Onion plant is subject to attack by neck rot disease caused by *Botrytis allii* (Munn). In this study the effect of various natural substance against neck rot disease were evaluated. The effect of plant extracts and essential oils on the disease incidence was studied. Plant extracts of six plant species, cloves (*Dianthus caryophyllus*), cinnamon (*Cinnamum zeylamicum*), thyme (*Thymus vulgaris* L.) fenugreek (*Trigonella fonicum*), amme (*Ammi visnagal*), black pepper (*Piper nigrum*) and three essential oils, geranium (*Pelargonium graveolens*), black cummin seeds (*Nigella sativa* L.) and blue gum (*Eucalyptus globulus*) were evaluated for their antifungal effect on the mycelial growth, incidence and disease severity of onion neck rot disease. The antifungal properties of cloves extract was more effective than black pepper then fenugreek extract on inhibiting mycelial growth and disease incidence, while amme, thyme cinnamon showed the lowest effect. On the other hand essential oil of geranium was more effective than blue gum and oil of black cummin seeds on inhibiting mycelial growth and reducing disease incidence.

EX 28

USE OF SOME PLANT EXTRACTS IN CONTROLLING FUSARIUM WILT OF PAPAYA SEEDLINGS CAUSED BY FUSARIUM OXYSPORUM. Ali Khamis Rowaished and Amal Hamid Moniam, Plant protection Department, Faculty of Agriculture, Aden University, P.O. Box 260, Crater, Aden, Yemen, Email: Rowaishedak@hotmail.com

Papaya seedlings infected severely with Fusarium wilt disease caused by *Fusarium oxysporum*, and infection may reach about 70% in some nurseries. This study aimed to evaluate some biopesticides to control disease infection by using plant extracts of three plants species; neem (*Azadirachta indica*), masqit (*Prosopis juliflora*), and milk-giant (*Calotropis procera*). The effect of aqueous extract of these plant extracts on fungal growth was tested under laboratory conditions. The effect of adding the extracts to the soil planted with infected seedlings was also tested under greenhouse conditions. The results indicated that plant extract inhibited the fungal growth which reached 56.9 55.8 and 77.0% with milk-giant, neem and masqit, respectively. The extract of milk-giant gave a better effect than other extracts. The results also showed that plant extracts decreased disease incidence of the seedlings to 9.2% for milk-giant; 17% for masqit and 18.6% for neem. This data emphasized the efficiency of plant extracts in controlling the papaya wilt disease due to the toxic effect of sulfur and the amino acids content of the leaves on the fungus.

EX 29

EFFECT OF ESSENTIAL OILS TO CONTROL FUNGAL DISEASE OF VEGETABLE CROPS IN ALGERIA. Bouldjedri Mohamed, Department Ecology, Faculty of Science, University of Jijel, Algéria, Email: m_bouldjedri@yahoo.com

Vegetable production have a great economic importance particularly those of Solanaceae and Cucurbitaceae, which are planted in large scale, whether in the field or in greenhouses. Over the last few

years, the number of greenhouse in Algeria reached 11750. In spite of that, the production remained low and did not correspond to the planted area which could be due to attack by fungal disease such as "late Blight", caused by *Phytophthora*; "Gray mold" caused by *Botrytis* and "Powdery mildew" caused by *Erysiphe* sp. To control such disease, farmers use chemical fungicides extensively. These products currently pose enormous ecological and health hazards. In this context, this work aimed to use plant essential oils as bio-fungicides. The effect of such oils on the growth of *Phytophthora* spp. was investigated in the laboratory. Results obtained showed that these essential oils can cause almost total inhibition to this pathogen.

EX 30

INHIBITORY ACTIVITY OF SOME PLANT EXTRACTS ON THE MULTIPLICATION OF POTATO VIRUS Y (PVY). A. K. Abbs¹, R. A. Ani² and Mysire M. Jarjees². (1) State Board for Agricultural Research Ministry of Agriculture, Abu-Ghraib, Baghdad, Iraq; (2) College of Agriculture, University of Baghdad, Abu-Ghraib, Baghdad, Iraq.

The effect of some plant extracts on the multiplication of Potato Virus Y (PVY) was determined by ELISA. Results showed that the application of the extract from thuja, pomegranate peel and tannic acid on the PVY-inoculated potato plants at 5 g/l led to complete inhibition of virus multiplication within 8, 16, and 16 days after inoculation, respectively. The spraying of pomegranate peel extract at 3 g/l on the PVY-inoculated potato plants did not completely inhibit the virus. The spraying of thuja extract at the same concentration, however, inhibited virus multiplication within 12 days from inoculation. The application of thuja and pomegranate peel extracts protected the plants from viral infection for 12 and 8 days respectively. There was no damage observed on treated plants.

EX 31

INFLUENCE OF SOME PLANT EXTRACTS IN REDUCING DECAY OF STORED TUBERS OF SOLANUM TUBEROSUM L. Omar H. Muslah and M.K. Al-Jebori, Department of Horticulture, College of Agriculture, University of Baghdad, Baghdad, Iraq, Email: omar_hasham@yahoo.com

This study was conducted to evaluate the influence of some plant extracts in reducing decay of stored potato tubers *Solanum tuberosum* L. cv. Desiree in the spring of the 2002 growing season. The tubers were planted and stored in the field and stores of Horticulture Department, Agriculture College, Baghdad University. Curing was done at 15±1°C and 80-85% relative humidity for 15 days. The tubers were dipped with the following extracts: Fenugreek, Caraway, Okra, Ber, and Vapor Gurd wax in addition to the control treatment in which tubers were dipped with water. Three concentrations of each extract 25, 50 and 100 % were used. Tubers were dipped for 10 or 20 minutes for all treatments then stored in the cold store at 4±1°C and 80-85% relative humidity for three months, and then transferred for reconditioning at 26-31°C and 45-50% relative humidity. The experiment was conducted in a randomized complete block design with four replications for each treatment. Means were compared according to LSD-test with 5% significance level. Results indicated that the okra extract at concentrations of 25, 50 and 100% for 20 minutes, caraway extract at 8 g/l for 20 minutes and wax treatment were all effective in preventing tuber decay. Okra extract significantly decreased decay to 0.34%.

EX 32

ALLELOPATHIC EFFECTS OF WEEDS ON GERMINATION AND SEEDLING GROWTH OF CHICKPEA, CICER ARIETINUM L. Basma Barhoum¹, Abdullah Abou Zaham² and Anwar Al-Moumar². (1) General Commission of Scientific Agricultural Research (GCSAR), Al-Ghab Station, Syria, Email: engbasima-m@maktoob.com; (2) Faculty of Agriculture, Damascus University, Damascus, Syria, Email: anwar-ma@scs-net.org

The competition between chickpea and weeds exceeds known competition limits into allelopathic effect which was reported in earlier studies to inhibit germination and reduce growth of both roots and shoots of young seedling, causing yield reduction for many crops. This study aimed at investigating the allelopathic effect of main weeds associated with winter chickpea production. Different extracts of seeds, roots and vegetative parts of two common weeds of chickpea crop, were applied on Ghab 3 Chickpea at different concentrations C1, C2 and C3. The test was conducted under controlled conditions at ICARDA laboratories. Results indicated that the allelopathic effects of these extracts caused decreased germination,

suppressing growth of both roots and shoots. This allelopathic effect continued till advanced stages of chickpea vegetative growth that was reflected on yield reduction of fresh and dry weight of chickpea. Seed extract of both weeds had the highest effect on seed germination, root and stem development, and chickpea biomass. Seed germination was significantly reduced in comparison with untreated check. This reduction was increased when higher extract concentrations were applied. Other weed extracts significantly affected germination and growth of chickpea but were less effective than seed extracts. Extract of *Sinapis arvensis* L. was more effective compared to *Brassica nigra* L. We conclude that effect of seed extract was higher than other extracts, and *S. arvensis* had stronger effect than to *B. nigra*. This study demonstrated the importance of weed competition on the germination and growth of chickpea, which is reflected in crop productivity. This also will emphasize the importance of the control of these noxious weeds especially in early stages to avoid their competition as well as allelopathic effect.

Natural Enemies

NE 1

APHYTIS LINGNANENSIS (HYMENOPTERA: APHELINIDAE) AS AN EFFECTIVE PARASITOID OF DIASPIDID SCALE INSECTS (HOMOPTERA: DIASPIDIDAE) IN EGYPT.
Shaaban Abd-Rabou and Mona Moustafa, Plant Protection Research Institute, Agriculture Research Center, Dokki, Giza, Egypt, Email: shaaban59@yahoo.com

Aphytis lingnanensis (Hymenoptera: Aphelinidae) is one of the most important parasitoids attacking some armored scale insects in Egypt. Surveys conducted during 2003-2005 in different localities in Egypt showed that, *A. lingnanensis* was associated with eight species of armored scale insects. These are *Aonidiella aurantii* (Maskell), *Aspidotus nerii* Bouche, *Chrysomphalus aonidum* (L.), *Chrysomphalus dictyospermi* (Morgan), *Hemiberlesia latania* (Signort), *Insulaspis pallidula* (Green), *Parlatoria ziziphi* (Lucas) and *Pseudaulacaspis pentagona* (Targioni-Tozzetti). Abundance of *A. chrysomphali* was assessed during 2003-2005 in four localities in Egypt (Behira, Giza, Qalyubiya and Sharqiya governorates). Maximum parasitism rates of *A. lingnanensis* of the above mentioned scale insects ranged between 10-65%. *A. lingnanensis* is an effective parasitoid of *A. aurantii* and *C. aonidum* in Egypt.

NE 2

LARVAL PARASITOIDS OF THE POTATO TUBER MOTH *PHTHORIMAEA OPERCULELLA* IN POTATO AND TOMATO. M.S.T. Abbas and Salwa S.M. Abdel-Samad, Plant Protection Research Institute, Dokki, Giza, Egypt, Email: salwa_ssss@yahoo.com

Larval parasitoids of the potato tuber moth, *Phthorimaea operculella* Zell. were surveyed in potato and tomato fields in Menofya Governorate in 2003. Three species were found to attack *P. operculella* larvae infesting potato plants; the endoparasitoids, *Apanteles litae* var. *operculella* Nixon and *Diadegma molliplum* Hlmgm. and the ectoparasitoid, *Bracon instalilis* Marshal. Meanwhile, only *B. instabilis* was found to attack the larvae infesting tomato leaves. Parasitism level in potato fields averaged 10.8, 5.6 and 2.6% by *B. instabilis*, *A. litae* and *D. molliplum*, respectively. The total rate of parasitism by the three species ranged from 11.0 to 28.6% with an average of 19.1% in potato field, while it ranged from 0.0 to 21.4% in tomato fields with an average of 11.1% by *B. instabilis*.

NE 3

BIOLOGICAL AND MORPHOLOGICAL STUDY ON THE PARASITOID *MONORTHOICHEATA NIGRA* AS A CONTROLLING AGENT FOR THE SUGAR-BEET BEETLE *CASSIDA VITTATA*.
Amal A. El-Zoghby, Plant Protection Research Institute, Department of Biological Control, Agriculture Research Center (ARC), 7 Nadi El Seid Street, Dokki, Giza, Egypt, Email: amalzoghby@hotmail.com

In Egypt, the most important endoparasitoid attacking eggs of *C. vittata* was *M. nigra* on sugar beet plants under laboratory conditions of 20 and 25°C temperature and 75-85% relative humidity. The morphology of the different developmental stages, the larval instars (first, second, third) pre-pupa and the pupal stages were described. The life cycle of the parasitoid, from egg deposition to the adult emergence was 22-28 days under laboratory conditions (20±5°C and 55±5% R.H.). On the other hand, at 20°C and 75% R.H., the life cycle of the parasitoid lasted 19-22 days, whereas it was 14-19 days at 25°C and 75% R.H. However, at 20°C and 85% R.H., the life cycle lasted 17-19 days and decreased to 13-17 days at 25°C and 85% R.H.

NE 4

EVALUATION OF CERTAIN EXOTIC APHID PARASITOID SPECIES AGAINST CEREAL APHIDS UNDER LABORATORY, FIELD CAGE AND OPEN WHEAT FIELD CONDITIONS.
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Aphids attack cereal crops, particularly wheat, barley and corn in many countries worldwide. Aphid parasitoids' importation and colonization have a great potential as a classical and effective biological control method. Through an Egyptian/American collaborative project (1997-2002), four cereal aphid exotic parasitoid species were imported from different countries, against key cereal aphid species in Egyptian and American wheat fields. The exotic cereal aphid parasitoid species were collected from Syria, Morocco, and Iran, in localities near the reported areas of the origin of cereal species and from habitats of climatic patterns

similar to those in Upper Egypt and Southern California, USA. *Aphidius matricariae* Haliday (Syria), *Diaeretiella rapae* M'Intosh (Morocco), *Aphidius rhopalosiphii* De Stefani (Hymenoptera: Aphidiidae) and *Aphelinus albigodius* Hayat & Fatima (Hymenoptera: Aphelinidae) (Iran) were the parasitoid species introduced and evaluated under laboratory, field cage and open wheat field conditions. The exotic parasitoid species showed different performances under several tested conditions. *A. matricariae* exceeded the other parasitoid species under similar conditions.

NE 5

NEW RECORD FOR THE PARASITOIDS OF THE PUMPKIN FLY, *DACUS CILIATUS* (LEOW) AND THE PEACH FRUIT FLY, *BACTROCERA ZONATA* (SAUNDERS) IN EGYPT. Badr El-Sabah A. Fetoh, Plant Protection Research Institute, ARC, Dokki, Giza, Egypt, Email: badrelsabah@yahoo.com

Survey for the parasitoids which attack the pumpkin fly, *Dacus ciliatus* and the peach fruit fly, *Bactrocera zonata* was conducted in Giza governorate, Egypt. Both flies appeared recently in Egypt without any earlier record for their natural enemies. In the present study, three hymenopterous parasitoids were identified: *Dirhinus griffii* (Chalcididae), *Spalangia cameroni* and *Pachycrepoides videmmia* (Pteromalidae). The parasitism rate of these parasitoids was calculated among vegetables such as white gourd, striped gourd, marrow, cucumber and luf, and among fruits such as peach, mango, guava, sour orange and mandarin. The highest parasitism rate was 13.3% on white gourd, and the lowest parasitism rate was 0% on luf. The highest parasitism rate on fruits was 9% on peach and the lowest parasitism rate was 3.6% on orange. Generally, these parasitoids occur during the active period of the pumpkin fly, *Dacus ciliatus* from July till February and then infest the peach fruit fly, *Bactrocera zonata* which is found in large numbers.

NE 6

A STUDY ON THE MORPHOLOGY AND BIOLOGY OF THE PARASITOID *ENCARSIA PORTERI* MERCET. H. Sakenin Chelav¹, H. Ghahari², M. Tabari³ and S. Abd-Rabou⁴. (1) Ghaemshahr Branch, Islamic Azad University, Mazandaran, Iran, Email: hchelave@yahoo.com; (2) Department of Agriculture, Shahr-e-Rey, Islamic Azad University, Tehran, Iran, Email: h_ghahhari@yahoo.com; (3) Rice Research Institute, Amol, Iran; (4) Plant Protection Research Institute, Ministry of Agriculture, Dokki, Giza, Egypt, Email: shaaban59@yahoo.com

Morphology, biology, and behavior of *Encarsia porteri* Mercet (Hymenoptera: Aphelinidae) were studied in a greenhouse at 24±2 °C, 65±5 RH% and 16:8 hr (L: D) photoperiod, on *Gossypium hirsutum* L. var. *ultan*. Morphological study was separately conducted for the male and female adults and larvae. Six life stages including, egg, three larval instars, pupa and adult were identified for the parasitoid. Among the different species of whiteflies (Homoptera: Aleyrodidae) and their live stages, the second nymphal stage of *Bemisia tabaci* Gennadius and fourth nymphal stage of *Trialeurodes vaporariorum* Westwood were preferred. The mated females parasitized both 2nd nymphal stage of *B. tabaci* and the egg of *Heliothis armigera* Huebner (Lepidoptera: Noctuidae), but unmated females parasitized only the moth's eggs. On the basis of the present research, *E. porteri* was found a parasitoid wasp, neither hyperparasitoid nor auto-hyperparasitoid. Host hemolymph and solution of 15% honey-syrup caused the highest effect on longevity and efficiency of mated and unmated parasitoid females. Longevity and fecundity of mated females was significantly higher than unmated ones. The best release ratio of parasitoid to second nymphal stage of *B. tabaci*, and moth's egg was 1-25 and 1-15, respectively. Mating and oviposition behavior of the parasitoid were also studied.

NE 7

THE FAUNA OF THE PARASITOID *ENCARSIA FOERSTER* IN GUILAN PROVINCE OF IRAN. H. Sakenin Chelav¹, H. Ghahari² and A. Abd-Rabou³. (1) Ghaemshahr Branch, Islamic Azad University, Mazandaran, Iran, Email: hchelave@yahoo.com; (2) Department of Agriculture, Shahr-e-Rey, Islamic Azad University, Tehran, Iran, Email: h_ghahhari@yahoo.com; (3) Plant Protection Research Institute, Ministry of Agriculture, Dokki, Giza, Egypt, Email: shaaban59@yahoo.com

During surveys conducted from 1999 to 2004 to collect and rear whiteflies (Homoptera: Aleyrodidae) and scale (Homoptera: Coccoidea) insects, in different regions of Guilan province of Iran, 18

species of *Encarsia* Foerster (Chalcidoidea: Aphelinidae) were collected and identified. The identified species were *E. acaudaleyrodus* Hayat, *E. aurantii* (Howard), *E. azimi* Hayat, *E. berleseii* (Howard), *E. citrina* (Craw), *E. elegans* Masi, *E. elongata* (Dozier), *E. fasciata* Hayat, *E. formosa* Gahan, *E. inaron* (Walker), *E. lounsburyi* (Berlese & Paoli), *E. lutea* (Masi), *E. luteola* Howard, *E. perniciosi* (Tower), *E. protransvena* Viggiani, *E. smithi* (Silvestri) and *E. sophia* (Girault & Dodd). Four species including, *E. luteola*, *E. protransvena*, *E. smithi*, and *E. sophia* are new records for Iran. In the present study, in addition to the introduction of *Encarsia* spp. from Guilan province, the new species were described and the taxonomic figures were drawn.

NE 8

STUDY OF THE BIO-EFFICIENCY AND THE MOST IMPORTANT BIOLOGICAL INDICATORS OF THE PARASITOID *ANAGYRUS AGRAENSIS* SARASWAT, AND SELECTING THE OPTIMAL METHODS OF REARING IT ON CITRUS AT THE SYRIAN COAST. Nadia Al-Khateeb¹ and Louai Asslan². (1) Directorate of Agriculture and Agrarian Reform of Lattakia, Center for Rearing Natural Enemies, P.O. Box 2012, Lattaki, Syria, Email: nadia@arabscientist.org; (2) Faculty of Agriculture, Damascus University, Damascus, Syria, Email: louai@arabscientist.org

The study was carried out in 2001-2002 at Lattakia Center for Rearing Natural Enemies. Infested samples with Pseudococcidae (*Planococcus citri* Risso, *Pseudococcus comstocki* Kuwana and *Pseudococcus adonidium* Linn.) were collected from citrus orchards and gardens. The parasitoid *Anagyrus agraeusis* (Hymenoptera: Encrtidae) was identified by the British Museum during 2001. The highest population the parasitoid *Anagyrus agraeusis* was found in June. The parasitoid was isolated and reared under laboratory conditions using different Pseudococcid species and by using potato as the host plant. The generation duration, sex ratio, and the longevity of the parasitoid on each species of Pseudococcidae were determined. The results showed that the generation duration for the mentioned parasitoid are 18.8 ± 2.77 , 19.4 ± 1.82 and 20.2 ± 1.92 days. The longevity of males on three Pseudococcidae species reached 9.8 ± 1.75 , 8.60 ± 1.51 and 8.9 ± 2.23 days and for females reached to 10.4 ± 2.07 , 9.1 ± 2.13 and 9.4 ± 1.71 days, respectively. The sex ratio was 1:1 under normal conditions, and the correlation between the *Anagyrus agraeusis* population and temperature was negative and low ($r = -0.13$), whereas the correlation (r) with relative humidity was -0.58 .

NE 9

MORPHOLOGICAL OBSERVATIONS AND BEHAVIOUR OF *PTEROMALUS PUPARUM* L. PARASITE ON *PAPLIO DEMOLEUS* L. WITH SPECIAL EMPHASIS ON KURDISTAN REGION. Feyroz R. Hassan and Talal T. Mahmoud, Department of Forestry, College of Agriculture, University of Dohuk, Kurdistan Region, Iraq, Email: feyrozrh77@yahoo.com

The present study focus on the morphology, behaviour and the parasitism rate in the field and laboratory of the parasite *Pteromalus puparum* L. on the *Papilio demoleus* L. The results showed that the parasite female laid their eggs gregariously inside the host larval body. After hatching, the parasite larvae developed and fed on the host content until pupation of the host insect, and then developed to pupae. Adults emerge through holes made at various places of the host pupal body, leading to its death. The average number of eggs laid by the parasite was 27.77 egg/larvae in the field and 208.38 egg/larvae under laboratory conditions, with a parasitism rate of 72.5% and 100%, in the field and the laboratory, respectively.

NE 10

BIOLOGICAL STUDIES ON THE PARASITOID *DOLICHOGNIDA TRACHALUS* (NIXON), COLLECTED FROM THE OLIVE BUDS MOTH (JASMINE MOTH) *PALPITA UNIONALIS* HÜBNER IN SYRIA. Mahmoud Sabri Lababidi, Department of Plant Protection, Faculty of Agriculture, University of Aleppo, P.O. Box 12052, Aleppo, Syria, Email: mslababi@scs-net.org

The biological studies revealed that the female parasitoid *Dolichognida trachalus* (Nixon) (Hymenoptera: Braconidae) deposited a single egg internally in the young host larva of *Palpia unionalis* Hübner (Lepidoptera: Pyralidae). The full-grown parasitoid larva emerged from the fourth instar host larva for pupation. The duration of the life cycle ranged from 10 to 15 days, under an average laboratory temperature 25°C and 65% RH. The incubation- and the larval period ranged from 5 to 9 days, and the

pupae period from 4 to 6 days at of 25°C and 65% RH. The adult longevity of both sexes ranged from 8.6 to 15.8 days at 15-30°C and 60-70% RH. The sex ratio (female: male) was approximately 1:0.8 under laboratory conditions. Parasitism rate differed greatly within any given year, among years, and localities. It may be concluded that this parasitoid, among other factors, did play a role in the regulation of its host population density.

NE 11

SURVEY AND SEASONAL FLUCTUATION OF PARASITIDS OF CITRUS LEAF MINER (*PHYLLOCNITIS CITRELLA* STANTON) IN THE SYRIAN COAST. Kais Ghazal, Lattakia Centre for Insectary and Reared Natural Enemies, Agriculture Department of Lattakia, P.O. Box 3100, Lattakia, Syria, Email: Kaisgazal@shufbc.com

A survey of citrus leaf miner parasitoids conducted during 2003-2005 indicated the presence of four parasitoids. The parasitoid *Semiela cher petiolatus* Girault imported from Australia in 1995 was the most common, and its relative occurrence was 87.34%, 93.54% and 98.45% in the three years, respectively. The relative occurrence of the local parasitoid *Ratzeburgiola incompleta* was 10.98%, 4.1% and 0.77% in the three years, respectively. Whereas, the rest of local parasitoids were rare. The relative occurrence of the local parasitoids *Citrostichus phyllocnistoides* Narayanan was 0%, 0.93% and 0.38% and that of the local parasitoid *Neochrysocharis Formosa* was 0.56%, 0.19% and 0%, respectively, in the three years.

NE 12

STUDY OF SOME BIOLOGICAL PROPERTIES OF EGG PARASITOID *OOENCYRTUS* SP. Khaled Mohamed Mardini¹ and Adel Al Yahri². (1) Insects of the Qatari Environment Project, Friends of the Environment Center, P.O. Box 1822, Doha, Qatar, Email: kmardini62@hotmail.com; (2) Ministry of Municipal Affairs and Agriculture, Doha, Qatar.

About 56 species of *Ooencyrtus* sp. (Encyrtidae: Hymenoptera) distributed worldwide, are very small parasites which attack eggs of various insects, mainly of Lepidoptera and Hemiptera. The parasitoid attacks the eggs of a lasiocampidae species, which feeds on leaves of *Conocarpus* sp. planted in Doha city. Results showed that: (a) the parasitism rate was 20% in the first generation, and reached 75% in the late generation, (b) One host egg gave 6.05±0.55 parasitoid adults, (c) sex ratio was 61.9 : 38.1% female to male, (d) adults' longevity was 26.5 days for females and 27.4 days for males (when they were fed on honey). Fasting longevity was 3.7 days.

NE 13

PRELIMINARY STUDY ON BIOLOGY AND PARASITIC ABILITY OF *RATZEBURGIOLA INCOMPLETA* BOUCEK A PARASITOID OF CITRUS LEAF MINER *PHYLLOCNITIS CITRELLA* STANTON. Amal N. Al-Khalidy, N.N. Hama, N.J. Humaidh and Ameara N.Hassan, National Centre of Integrated Pest Management, State Board of Agriculture Research, Ministry of Agriculture, Baghdad, Iraq, Email: alasady61@yahoo.com

Sour orange (*Citrus aurantium*) seedlings, 1-2 years old, were used for artificial infestation with citrus leaf miner (CLM) *Phyllocnistis citrella* in Abughraib (Baghdad) during 2004-2005. These seedlings were kept inside a shade house with semi controlled temperature and relative humidity. Polyethylene covers and saran nets were used in winter and summer, respectively to ensure the provision of suitable conditions inside the shade house. After infestation with CLM, the adult parasitoids of *Ratzeburgiola incompleta* were released continuously to establish an active colony of CLM in order to use it in the following experiment. The life history of the parasitoid was studied under laboratory condition at 22±2°C, relative humidity 60-70% and a photo period of eight hours light and 16 hour darkness. The average incubation period of eggs, the larval stage, the pupal stage and the adult life span were 17, 49, 79 and 145 days, respectively. The results also showed that the adult females of the parasitoid had the ability to mate and lay eggs even if they stored for 40 days at a temperature of 5±2°C. The release of parasitoids in different numbers reduced the density of CLM in the breeding cages.

NE 14

SOME BIOLOGICAL CHARACTERISTICS OF TWO SUNN PEST EGG PARASITOIDS (*TRISSOLCUS GRANDIS* THOMSON) AND (*TRISSOLCUS VASSILIEVI* MAYR) UNDER LABORATORY CONDITIONS. Abdul Nasser Trissi¹, Mohammed Abdulhai² and Mustapha El-Bouhssini³. (1) Faculty of Agriculture, Aleppo University, Aleppo, Syria; (2) General Commission for Scientific Agricultural research, Aleppo Center, Aleppo, Syria, Email: mohamad_abdulhai@yahoo.com; (3) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: M.Bohssini@cgiar.org

The biology of two species of Sunn pest (*Eurygaster integriceps* Put.) egg parasitoids, *Trissolcus grandis* Thomson and *Trissolcus vassilievi* Mayr (Scelionidae: Hymenoptera), was investigated under laboratory conditions (23±2°C, RH 60-70%, 16:8 D:L photoperiod) in 2005. Female longevity was 20 and 13 days, the mean number of parasitized eggs /female was 118 and 100 eggs, the average percent hatch of parasitized eggs was 87 and 85%, the average percent of females was 89 and 87%, the mean developmental time of females from egg laying to emergence was 13 and 12 days and that of males was 12 and 11 days for *T. vassilievi* and *T. grandis*, respectively. These results indicated some superiority of *T. vassilievi* over *T. grandis* because of its capability of parasitizing a significantly higher number of Sunn pest eggs as a result of longer female longevity.

NE 15

THE EFFECT OF TEMPERATURE ON SOME BIOLOGICAL CHARACTERS OF *TRISSOLCUS VASSILIEVI* MAYER, AN EGG PARASITOID OF SUNN PEST (*EURYGASTER INTEGRICEPS* PUTON.). Abdul Nasser Trissi¹, Mustapha El-Bouhssini² And Ahmad Kzaez¹. (1) Faculty of Agriculture, Aleppo University, Aleppo, Syria, Email: n-trissi@scs-net.org; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: M.Bohssini@cgiar.org

Trissolcus vassilievi Mayer (Hymenoptera: Scelionidae), is an important egg parasitoid of Sunn Pest (*Eurygaster integriceps* Puton.). This natural enemy and other scelionids suppress Sunn Pest population in wheat fields. The effect of different temperatures (20, 23 and 26±1°C) on some biological characterization of adult parasitoids was investigated under laboratory conditions, using eggs of Sunn pest as host. Fecundity tended to be higher at higher temperatures. The total number of eggs per female was 65 and 92 eggs at 20°C and 26°C, respectively. The development period for females ranged from 11.1 days at 26°C to 21.2 days at 20°C. The average female longevity was 25.3 and 17.8 days at 20°C and 26°C, respectively. These results indicated that temperature had a significant effect on longevity and oviposition periods.

NE 16

BIOLOGICAL STUDY ON THE PARASITOID APHELINUS GOSSYPHII (*TIMBERLAKE*) AT THREE DIFFERENT TEMPERATURES. Leena A. Irshaid¹ and Thabit R. Allawi². (1) Department of Biotechnology, Faculty of Agricultural Technology, Al-Balqa' Applied University, Al-Salt 19117, Jordan, Email: Leena@bau.edu.jo; (2) Department of Plant Protection, Faculty of Agriculture, Jordan University.

Aphelinus gossypii (Timberlake) (Hymenoptera: Aphelinidae) is one of the important parasitoids on melon aphid. Biological studies were conducted on this parasitoid under laboratory conditions at three different temperatures 20, 25 and 30°C. Parasitoid adult female preferred to parasitize on first and second aphid nymphal instars at the three temperature regimes. The mean developmental period for parasitoid female was longer than that for male at the three temperatures. They were 13.4, 11.2 and 10.1 days for female with ranges between 12-12.5, 10-10.5 and 9 days for male. The mean longevity of the parasitoid female were 15.10, 10.23 and 2.7 days at 20, 25 and 30°C, respectively. The fecundity was determined by the number of parasitized aphid (as mummies) per female during its life span. Total Fecundity means (mummy/ female) were 107.93, 92.2 and 21.1 at 20, 25 and 30°C, respectively. The daily number of eggs laid was the highest at 25°C. Longevity was shorter at 25°C than at 20°C, but more eggs were laid per day, and total fecundity was not significantly different. Adult emergence rate was higher at 25°C, but not significantly different from that at 20°C, and was lower at 30°C. There was no significant effect of temperature on sex ratio, but when temperature increased female: male ration slightly increased at the tested temperatures. Female numbers was higher than male, with a ratio of 1.5:1. Adult females of the parasitoid was observed feeding on the aphids. The duration of feeding was much longer than the parasitism process.

For host feeding, the mean duration during ovipositor insertion was longer than ovipositional attack, as it took about 8 min., while the mean duration for depositing an egg was 85.9 seconds (1.5 min.) with a range of 25-175 seconds. However, when ovipositor insertion lasted for less than twenty seconds, the parasitism did not succeed. The feeding process is an additional controlling method of aphid by this parasitoid in addition to parasitism. The total number of aphids consumed by adult parasitoid female were 94, 109 and 45, whereas the average daily numbers consumed by the females were 6.184, 10.5 and 16.8 aphids at 20, 25 and 30°C, respectively.

NE 17

COMPARISON OF THE EFFICACY OF *ENCARSIA FORMOSA* (GAHAN) AND *ERETMOCERUS MUNDUS* (MERCET) IN SYRIAN ENVIRONMENT. Randa Abou-Tara¹, Fawzy Samara², Majd Jamal² and Fawzy Shalaby³. (1) General Commission of Scientific Agricultural research, Douma, P.O. Box 113, Damascus, Syria, Email: randaaboutara@hotmail.com; (2) Faculty of Agriculture, Damascus University, Syria; (3) Zakazik University, Egypt.

The efficacy of *Encarsia formosa* (Gahan) and *Eretmocerus mundus* (Mercet) was studied under field conditions in 2004- 2005. The insect host of both parasitoids was *Bemisia tabaci* and the host plant was *Lantana camara*. The rate of parasitism was recorded at intervals of 15 days, the maximum and minimum daily temperatures were also recorded and the mean temperature of the fifteen days was calculated. The highest parasitism rate for *E. Formosa* was recorded in November 2004, it reached 70.54%, and the lowest was 16.07% and it was recorded in August 2004. Similarly, the highest parasitism rate of *E. mundus* was recorded in October 2004 and it reached 68.81%, and the lowest was recorded in August 2004. Both parasitoids attacked whitefly in winter (Winter parasitism), this, in addition to the high rate of parasitism, indicates to what extent these parasitoids are adopted to the Syrian environment.

NE 18

HYPERPARASITOIDS OF SCALE INSECTS (HOMOPTERA) IN EGYPT. Shaaban Abd-Rabou, Plant Protection Research Institute, Agriculture Research Center, 7 Nadi El-Seid, Dokki, Giza, Egypt, Email: shaaban59@yahoo.com

Survey for hyperparasitoids of scale insects (Homoptera: Coccoidea: Diaspididae: Coccidae: Pseudococcidae) was conducted during the period from 2004-2005. During this work ten species of hymenopteran hyperparasitoids were identified. These were: *Ablerus atomon* (Walker), *Ablerus chionaspidis* Howard, *Ablerus clisiocampae* (Ashmead), *Ablerus perspicuosus* (Girault), *Chartocerus subaeneus* (Foerster), *Chartocerus niger* (Ashmead), *Marietta carnesi* (Howard), *Marietta leopardina* Motschulsky, *Marietta picta* (Andre), *Signiphora flavella* Girault. The species belong to 3 genera and 2 families, including Aphelinidae and Signiphoridae. Six of them are recorded for the first time in Egypt.

NE 19

THE IMPACT OF NATURAL ENEMIES IN REGULATING CEREAL APHID POPULATIONS INFESTING WHEAT PLANTS AT UPPER EGYPT. M.A.A. Abdel-Rahman, Plant Protection Research Institute, ARC, Cairo, Egypt, Email: alaaa4@hotmail.com

A five years study (2001-2005) was conducted in Upper Egypt to elucidate the impact of natural enemies on cereal aphid populations. The most common cereal aphid species infesting wheat plants in Upper Egypt were: the greenbug, *Schizaphis graminum* (Rond.) and the oat bird-cherry aphid, *Rhopalosiphum padi* L. Apter and nymphs mixed population of these species were commonly found at the same location on the wheat plants. The predators associated with cereal aphids were: Coccinellids (*Coccinella undecimpunctata* L. and *Scymnus* spp.) *Orius* spp., *Chrysoperlla carnea*, *Paederus alferii* and some true spiders species. Seven species of primary parasitoids as well as one species of secondary parasitoid were also found. The primary parasitoids were *Aphidius colemani* Viereck, *A. matricaria* Haliday, *Diaeretiella rapae* M'Intosh, *Ephidrus plagiator* (Nees), *Praon necans* Mackauer, *Aphelinus* spp. and *Trioxys* spp. The results indicate that *D. rapae* and *P. necans* were the most important primary parasitoids. However, *Aphidius colemani* and *A. matricariae* could be of economic importance, if the environmental conditions changed in their favour. Meanwhile, the species of *E. plagiator*, *Aphelinus* spp. and *Trioxys* spp. were of little economic importance. Twelve species of Entomopathogenic fungi were identified. Cereal aphids began to infest wheat plants

during the last week of December and developed up to the end of March. The maximum levels were reached during the end of February and the beginning of March. The impact of the above mentioned biological control agents were evaluated in controlling cereal aphid populations in Upper Egypt under natural conditions.

NE 20

NATURAL ENEMIES OF THE ACACIA BAGWORM *AUCHMOPHILA KORDOFENSIS* REBEL (LEPIDOPTERA, PSYCHIDAE) AND THEIR ROLE IN THE NATURAL CONTROL. Mohammed E.E Mahmoud, Ahmed H. Mohamed and Musa A. Ahmed, Crop Protection Research Center, Agricultural Research Corporation, Wad Medani, Sudan, Email: nazeiro@maktoob.com

The Acacia bagworm, *Auchmophila kordofensis* Rebel, is a serious defoliator of *Acacia nubica*. This study was carried out in north Kordofan in 2004 to determine natural enemies of the acacia bagworm and assess their role as control agents. The parasitoids found associated with the acacia bagworm were *Tachina ebneri* Villeneuve, *Eurytoma* spp., *Goryphus nursei* Cameron, *Brachymeria* sp. and three other unidentified hymenopterous species. The mean percent of parasitism by both *Tachina ebneri* and *Eurytoma* spp reached 24.5%. Predation by ants, mainly *Messor galla* and *Catalyphus bicolor*, was 23%. Also several spiders were found preying on the bagworm.

NE 21

MANIPULATION OF THE SEVEN SPOTTED LADY BEETLE, *COCCINELLA SEPTEMPUNCTATA* FOR AUGMENTATIVE RELEASE TO CONTROL THE WOOLLY APPLE APHID, *ERIOSOMA LANIGERUM*. Ashraf A. H. Mangoud, Plant Protection Institute, ARC, Dokki, Giza, 12618, Egypt, Email: ashrafhendy2001@yahoo.com

The woolly apple aphid is a monophagous species and a bark feeder, infesting both the stems and roots of apple trees. The seven-spotted ladybird (*Coccinella septempunctata*) (Coccinellidae: Coleoptera) is an important predator of aphids playing a good role in reducing the population density of *Eriosoma lanigerum* (Aphididae: Homoptera). The predator was released (one time) in early April 2004 and 2005, at Qualubia Governorate. The achieved reductions in aphid population by the end of November were 72.3, 87.3 and 95.5% during 2004, and 77.1, 90.1 and 96.0% during 2005, at release rate of 30, 60 and 90 eggs of *C. septempunctata*/tree, respectively. Therefore, the seven-spotted ladybird, could be used successfully, as an active component in the integrated program for controlling the woolly apple aphid on the apple trees, and consequently minimize insecticides hazards on public health and environment.

NE 22

EVALUATION OF THE EXTENT OF *COCCINELLA SEPTEMPUNCTATA* RESPONSE TO GENETIC IMPROVEMENT BY RANDOM ALLOGAMY. Louai Asslan¹ and Nadia Al-Khateeb². (1) Faculty of Agriculture, Damascus University, Damascus, Syria, Email: louai@arabscientist.org; (2) Directorate of Agriculture and Agrarian Reform of Lattakia Center for Rearing Natural Enemies, Lattakia, Syria, Email: nadia@arabscientist.org

Coccinella septempunctata was reared by allogamy to convert from the natural local population to a lab population for the purpose of artificially producing *Coccinella septempunctata* and maintaining the numerical values of its biological and morphological indicators. The research was conducted on local *Coccinella septempunctata* progenies collected from fields along the Syrian Coast. The results proved the genetic stability of these progenies through three generations. All statistical differences were non-significant at $P=0.05$. The results indicated the following: (i) Fecundity increased from 98.2 ± 20.8 in P0 to 105.6 ± 20.3 in P2, and the response of this indicator to allogamy was 7.5%; (ii) Predation rate of larva increased from 88.8 ± 2.87 in P0 to 94.8 ± 12.31 in P2, and the response of this indicator was 6.8%. In addition, the values of all the other biological indicators (development period, life continuity indicator, and increase in female body length) was increased.

NE 23

EFFECTIVENESS OF THE PREDATOR *SERANGIUM PARCESETOSUM* SICARD AS A CONTROL AGENT FOR *BEMISIA TABACI* (GENN.). Rafeek Abboud¹, Mohammad Ahamad² and Nabil Abo Kaf². (1) Agricultural Research Center, Lattakia, General Commission of Agricultural Scientific Research, Syria, Email: abboudrafeek@hotmail.com; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

A study was carried out on the predator *Serangium parcesetosum* (Coleoptera: Coccinellidae) using the cotton whitefly, *Bemisia tabaci* (Homoptera: Aleyrodidae) as prey. The present study aimed to observe length of the feeding time of prey, in addition to determine the effect on prey host plants, and to evaluate the release rate of the predator to control *Bemisia tabaci* Genn. on eggplants in cages. Developmental time at 27°C from oviposition to emergence of adults was 15.9 and 16.5 days on cucumber and tomato, respectively. On the other hand, larvae of *S. parcesetosum* did not survive on tobacco leaves. Handling time increased with stage of whitefly from 125.9 sec for eggs to 53.1 min for fourth instar. Handling time decreased with stage of predator from 125.9 sec for first instar when feeding on the egg to 13.4 sec for fourth instar. The number of different whitefly stages increased in treated cages until the third week, than began to decrease from about 12 immature stages/1 cm² leaf to 0.44 after seven weeks. Whereas, the density of whitefly population in the control treatment increased 3 fold in the same period. The density of the coccinellid larvae reached the peak in the 5th week (6.56±3.9 larvae/plant) in the treatment with 3 adults per plant, and 16.6±7.4 larvae/plant in the treatment with 6 adults per plant. The number of predator adults reached the peak at the end of the 7th week, where it reached 14.1±1.8 and 8.3±0.8 adult/plant in the first and in the second treatment, respectively.

NE 24

PRELIMINARY SURVEY OF THE PREDATOR *ORIUS ALBIDIPENNIS* ON COTTON FIELDS IN MIDDLE OF IRAQ. Amal S. Abdel Razak, Nazar N. Hama, Nedaa S. Abid and Ahmad Atiya Afy, State Board for Agricultural Research, Abu Ghraib, Baghdad, Iraq, Email: amal2004s2000@yahoo.com

Field studies indicated that predator *Orius albidipennis* (Hemiptera: Anthocoridae) was the most dominating predator on cotton plants representing 26.12% of the total number of predators in 2003 and 36% in the 2004. The highest density was recorded during the second week of October when the maximum temperature was 34 °C and the minimum was 27 °C with relative humidity of 44%. The studies indicated also that the predator peak was synchronous with the peak of spiny boll worm *Earias insulana* eggs.

NE 25

PRELIMINARY SURVEY FOR NATURAL ENEMIES ON TOMATO PESTS (INSECTS AND MITES) IN GREENHOUSES IN SYRIA COASTAL REGION. Mohammad Ahmad, Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

A survey of natural enemies in greenhouses was conducted during the 2004/2005 and 2005/2006 growing seasons. The aim of this study was to define natural enemies (parasitoids and predators) that attack tomato pests in greenhouses. The results showed the presence of the following natural enemies: *Eretmocerus mundus* and *Encarsia formosa* (Hymenoptera: Aphelinidae), *Stethorus gilvifrons* (Coleoptera: Coccinellidae), *Aphidoletes aphidimyza*, *Feltiella acarisuga* (Diptera: Cecidomyiidae), *Scolothrips sexmaculatus* (Thysanoptera: Thripidae), *Dicyphus* sp. (Hemiptera: Miridae), *Diglyphus isaea* (Hymenoptera: Eulophidae), *Hyposoter* sp. (Hymenoptera: Ichneumonidae) *Euplectrus* sp. (Hymenoptera: Eulophidae), *Praon* sp. (Hymenoptera: Aphidiidae). Moreover, the population changes of some of these natural enemies were determined. This study will be continued to select the most efficient natural enemies for applied biological control.

NE 26

INVENTORY OF THE PARASITIC COMPLEX OF *PHYLLOCNISTIS CITRELLA* STAINTON IN THE AREA OF MOSTAGANEM, ALGERIA. Malika Boualem and A. Berkani, Plant Protection Laboratory, University of Mostaganem, BP. 300, Mostaganem, Algeria 2700, Email: laboratory-pv@univ-mosta.dz, boualemmalika@yahoo.fr

The biological control is considered as one of the most appreciated strategies to control the populations of *Phyllocnistis citrella* Stainton. An inventory of the natural enemies of *P. citrella* (Lepidoptera : Gracillariidae) was carried out over two consecutive years in various sites of citrus production in Mostaganem and Mohammadia regions. A weekly sampling of 100 contaminated shoots of orange tree was carried out for each site. The results revealed the presence of the following natural enemy species: *Chrysocharis* sp., *Cirrospilus vittatus*, *Cirrospilus pictus*, *Pnigalio mediterraneu* and *Sympiesis gregorie*. The natural enemy species which showed a regular presence during the two years of study with a high frequency, particularly during the hottest months, was *Pnigalio mediterraneus*. The observations showed a high capacity for adaptation in the exotic species *Semielacher petiolatus*. The study also indicated that the most susceptible stage of *P. citrella* to attack by natural enemies were the 2nd larval and nymphal stages.

NE 27

THE STUDY OF THE INFESTATION RATE OF SCALE INSECTS (*AONIDIELLA AURANTII* MASKELL, *LEPIDOSAPHES BECKII* NEWMAN, *PARLATORIA PERGANDII* COMSTOCK) AND THEIR NATURAL ENEMIES ON CITRUS IN THE SYRIAN COAST. Kais Ghazal, Lattakia Centre for Insectary and Reared Natural Enemies, Agriculture Department of Lattakia, P.O. Box 3100, Lattakia, Syria, Email: Kaisgazal@shufbc.com

The armored scale insects are considered as main pests which infest citrus in Syria and the common species in Syria are *A. aurantii*, *L. beckii* and *P. pergandii*. This study aimed to identify the most widely spread insect on citrus. In the 2004/2005 season *P. Pergandii* reached the highest infestation rate (72.02%) followed by *A. aurantii* (17.94%) and *L. beckii* (10.02%). In the 2005/2006 season in 7 locations, the infestation rate of *P. pergandii* was 73.62%, *A. aurantii* 18.42% and *L. beckii* 7.94%. There were two parasitoids identified on *P. pergandii* (*Encarsia* spp., *Aphytis* spp.), a third unknown parasitoid, and a predator cheyletid mite. There were four parasitoids on *A.aurantii* and four parasitoids on *L. beckii* (*Encarsia* spp., *Aphytis* spp., *Marietta picta*), one of them was unknown. There were two predators on the three insects (*Chilocorus bipustulatus* Linnaeus and *Rhyzobius* spp.) and a predator Cheletid mite which was also a predator of its own eggs, but was rare.

NE 28

EFFECT OF FERTILIZER TYPE ON THE NUMBER OF PREYS *MYZUS PERSICAE* SULZ. AND *BEMISIA TABACI* GENN. AND TWO PREDATORS *COCCINELLA SEPTEMPUNCTATA* L. AND *C. UNDECIMPUNCTATA* L. ON POTATO YIELD COMPONENTS. Sahil Kawkab Al-Jameel and Suaad Irdeny Abdulla, Plant Protection Department, College of Agriculture and Forestry Mosul University, Mousel, Iraq, Email: nadeemramadan@yahoo.com

The study showed that the type of fertilizer had a significant effect on the mean number of prey (*Myzus persicae* and *Bemisia tabaci*) and predators (*Coccinella septempunctata* and *C. undecumpunctat*) and on potato yield components during the 2003 season at Al Rashidiya and Al Danadan. It was shown that the fertilizer treatment consisting of 86.5 kg N/donom + 20 kg K/donom of potassium and 3 g/litter of foliar application was the best treatment in terms of the highest mean of *M. persicae* and *B. tabaci* and coccinellids in Al-Danadan in 2003. The same treatment gave the best plant and yield of plant height (131.33 cm), number of tubers (18 tuber/plant), plant yield (1313.20 g) and total yield (14.10 tons/donom).

NE 29

A PRIMARY INVESTIGATION ON ALMOND AND PEACH APHIDS AND NATURAL ENEMIES OF *BRACHYCAUDUS AMYGDALINUS* IN AL-ARAB MOUNTAIN, SOUTHERN SYRIA. Wa'el Almatni¹ and Nazir Khalil². (1) Division of Pest Management, Department of Plant Protection, Ministry of Agriculture, Damascus, Syria, Email: almatni@scs-net.org; (2) Division of Animal Biology, Faculty of Biology, Damascus University, Damascus, Syria, Email: khalil-n@scs-net.org

A field study was carried out on aphids that attack almond and peach trees in Al-Arab mountain at Sweida governorate, between 2002 and 2006. Three aphid species were considered as important pests on both crops. They were *Brachycaudus amygdalinus* and *B. helichrysi* (Aphididae: Homoptera) aphids that feed on the young leaves causing stunted growth; and *Pterochloroides persicae* which is a species that attack the bark and excretes large quantities of honeydew. A survey of natural enemies of *B. amygdalinus* was also conducted to study their population dynamics during the 2002, 2003 and 2004 seasons. Thirty predators species were recorded include 15 species in the family Coccinellidae, 4 each in Anthocoridae and Miridae, 3 in Syrphidae, one species each in Chrysopidae and Chamaemyiidae, and one beetle, in addition to one parasitoid in the family Aphidiidae. Some Arachnids were also mentioned to prey on this aphid. Most common predator at the beginning of the season was *Coccinella septempunctata* followed later by *Scymnus (Pullus) subvillosus* and *Hyppodamia variegata*. Most common predator bug was *Orius horvathi*.

NE 30

LABORATORY STUDY ON THE PREDATOR-PREY RELATIONSHIP BETWEEN THE PREDATORY BUG, *ORIUS LAEVIGATUS* (FIBER) AND THE TOBACCO WHITEFLY, *BEMISIA TABACI* (GENNADIUS). Iyad Taleb Mohammad Abu-Awad and Abdul-Jalil Hamdan, Faculty of Agriculture, Hebron University, Hebron P.O. Box 40, Palestine, Email: ajhamdan@hebron.edu

This study deals with laboratory assessment on the possibility of using the predatory bug, *Orius laevigatus* (Fiber) (Hemiptera: Anthocoridae) as a natural enemy against tobacco whitefly, *B. tabaci* (Homoptera: Aleyrodidae) reared on tomato and eggplant leaf discs under constant climatic conditions of 25±1°C, 75±5% R.H and 16L: 8D photoperiods. Results of the present study showed that, both nymphs and adults of *O. laevigatus* were able to feed on both eggs and larvae of *B. tabaci* when reared on tomato or eggplant with preference for feeding on *B. tabaci* eggs more than on larvae. It was also found that, during all nymphal stages, *O. laevigatus* consumed an average of 364.68 (eggs and larvae) of *B. tabaci* when reared on tomato leaf discs and 283.46 when reared on eggplant. In addition, during its adult life span, adult females of *O. laevigatus* consumed an average of 883 (eggs and larvae) when reared on tomato and 455 (eggs and larvae) on eggplant. Results showed that adult longevity and fertility of *O. laevigatus* were greater when fed on *B. tabaci* reared on tomato rather than that on eggplant. It was also found that survival of *O. laevigatus* fitted to Type II when fed on *B. tabaci* reared on tomato but to Type III on eggplant. In conclusion, the present study showed that the predatory bug *O. laevigatus* completed its nymphal development to adult stages and produced new generation when reared on tomato or eggplant leaf discs heavily infested with *B. tabaci* eggs and larvae. This study also showed that the rate of predation and fertility of *O. laevigatus* was affected by the host plant. Finally, further investigations are suggested to be done in the field to enhance the practical use of *O. laevigatus* as a bio-control agent against *B. tabaci* infestation on tomato or eggplant.

NE 31

SURVEY OF AGROMYZID LEAF MINERS (DIPTERA: AGROMYZIDAE), THEIR HOST PLANTS AND NATURAL ENEMIES. Rasmia Al-Muallem and Hanaa Asaad, General Commission of Scientific Agricultural Research, Douma, P.O.Box 113, Damascus, Syria, Email: arasmia@scs-net.org

Agromyzid leafminers (Diptera: Agromyzidae) are important pests of vegetables, field crops and ornamentals in protected culture and open field in Syria. A survey of agromyzid leafminers was conducted in 2000-2001 and it covered all the country except east and north region. The survey showed that agromyzid leafminers are widely distributed in Syria. Three species were recorded: *Chromatomyia horticola* (Goureau), *Liriomyza huidobrensis* (Blanchard) and *Liriomyza trifolii* (Burgess). *Ch. horticola* was the most common species found in all visited locations. It was recorded on 49 plant species but it caused no significant damages because it has only two generations per year and because of impact of the natural enemies which suppressed the population growth and kept it below the economic injury level. *L. huidobrensis* was recorded

on 34 plant species, it caused serious damage on vegetables and ornamentals especially in protected cultures. *L. trifolii* was not widely distributed. *L. huidobrensis* and *L. trifolii* are not indigenous species, probably they were introduced into the country on imported ornamentals. Ten species of parasitoids were recorded: *Diglyphus isaea* Walker, *D. minoens* Walker, *D. poppoea* Walker, *Chrysocharis ainsliei* Crawford, *Chrysonotomyia lyonetae* Ferriere, *Neochrysocharis Formosa* Westwood, *Pediobius acantha* Walker, *Hemiptarsinus* sp., *Halticoptera* sp. and *opius* sp. In addition, three species of predators were identified: *Coenosia attenuata* Stein, *Crossopalpus* sp. and *platypalpus* sp. *D. isaea* was the most important natural enemy, it needs to be thoroughly studied in order to use it in the integrated management programs of leafminers.

NE 32

LABORATORY REARING OF *CHISOPAERLA CARNEA* ON TOBACCO PLANTS. Fedaa Chamsin, Nabeel Abo Kaf and Maher Masre, General Organization of Tobacco, The Research Section, P.O. Box 3100, Lattakia, Syria, Email: kaisgazal@shufbc.com

When reared in the laboratory life span of *Chisopaerla carnea* from egg to adult ranged from 23 to 29 days. The egg hatched after 4-5 days. The larvae stage was 12.5 days, and the nymph stage from 9-12 days. The adult insect stage was 47-51 days. The three larva stages of *Chisopaerla carnea* consumed 149 nymphs of *Myzus persicae*, and females produced an average of 554 eggs during their life span.

NE 33

THE DISTRIBUTION OF THE PATTERNS OF COAGULATION IN SOME INSECT PREDATORS. Talal T. Mahmoud, University of Dohuk, College of Agriculture, Iraq, Email: taherm47@yahoo.com

This study was carried out to find the patterns of coagulation of the haemocytes of the predators. *Syrphus corollae* F., *Coccinella septempunctata* L. and *Chrysopa carnea* L. In syrphid larvae, two categories of haemocytes were observed one was hyaline, and the other haemocyte was small and dark. In the other two species, the small dark haemocyte was the only haemocyte taking part in plasma reaction and coagulation process. The time for complete clotting of the cells was 25 min in the Coccinellid, whereas it was 30 and 40 min in Syrphid and Chrysopid, respectively.

NE 34

MORPHOLOGICAL AND BIOLOGICAL STUDIES ON THE COCCINELLID *PSYLLOBORA BISOCTONOTATA* MUL., A PREDATOR OF POWDERY MILDEWS. Gaidaa Younes¹, Mohammad Ahmad² and Nawal Ali¹. (1) Department of Botany, Faculty of Science, Tishreen University, Lattakia, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Tishreen University, Lattakia, Syria.

The coccinellid *Psyllobora bisoconotata* is found in all regions of the Syrian Coast. The larval and adult stages of ladybird beetles feeds on powdery mildews, which infect many wild and crop plants (weeds, field crops, fruit trees and forest trees). This ladybird appears usually from early April up to the end of November. *P. bisoconotata* was recorded on 56 plant species in the study sites. Morphology and biology of *P. bisoconotata* were studied under laboratory conditions ($C^{\circ}=25\pm 2$, $RH=70\pm 5$, $L:D=16:8$). Insects were reared on *Erysiphe cichoracearum* fungus infecting *Picris* leaves and on *Erysiphe cichoracearum* and *Sphaerotheca fuliginea* on okra and squash leaves. The total period for development from egg to adult was 24.1 ± 2.08 days when reared on *E. cichoracearum* on *Picris* leaves, whereas it decreased to 18.4 ± 1.52 days on *E. cichoracearum* and *S. fuliginea* on squash leaves. The mean longevity was 72.6 ± 46.24 days for female, and 47.25 ± 19.65 days for male on okra. The mean fecundity was 124 ± 81.96 egg/female on *Picris* leaves, 62.45 ± 37.45 egg/female on squash leaves, and decreased to 44.81 ± 18.39 egg/female on okra leaves.

NE 35

MYCETOGLYPHUS QASSIMI AND TYROPHAGUS PUTRESCENTIAE, TWO ACARID MITES RECOVERED FROM PALM FIELDS, FEEDING ON ROOT-KNOT NEMATODE MELOIDOGYNE JAVANICA IN AL-QASSIM AREA, SAUDI ARABIA. Sulloiman Al-Rehiayani and Ahmed H. Fouly, Plant Production and Protection Department, Al Qassim University, College of Agriculture and Veterinary Medicine, Buraidah, P.O. Box 1482, Saudi Arabia, Email: alreh@yahoo.com

Two acarid mites *Mycetoglyphus qassimi* Fouly and Al-Rehiayani, and *Tyrophagus putrescentiae* (Schrank) recovered from A date palm field in Al-Qassim area, Saudi Arabia were tested against the root-knot nematode *Meloidogyne javanica* under lab conditions. The life history of both mite species was also studied under controlled conditions of 27°C and 70% RH. The two mites are considered omnivorous, as they fed on three different food sources tested, egg masses *M. javanica*, date palm *Phoenix dactylifera* L. pollens, and fungal propagules of *Aspergillus niger*. Acarid mites successfully completed their life cycle feeding on all types of food tested. Feeding on egg masses of *M. javanica* accelerated their development. Some second stage larvae were observed in the rearing units of *M. qassimi*. Males of both species reached the adult stage before females, and had shorter life span than females. A diet of *M. javanica* eggs was the most suitable food and supported the highest net reproductive rate R_0 (fecundity) for *M. qassimi* while pollen grains were the best for *T. putrescentiae*. The intrinsic rate of natural increase (r^m) was at its highest level when *M. qassimi* and *T. putrescentiae* were provided with egg masses of the nematode, followed by pollen and fungi. Similar trends were observed with the finite rates of increase (e^m). Results showed that *Mycetoglyphus* mite could be an effective biological control agent against egg masses of *M. javanica*.

Host Resistance

R 1

EFFECT OF *ALTERNARIA ALTERNATA* ON GROWTH OF SOME *VICIA FABA* L. CULTIVARS. Akram Hamdi Kasem and Ghaydaa Salah Husein. Biology Department, Collage of Sconces, Mosul University, Mosul, Iraq, Email: mhmd2agr@yahoo.com

Three varieties of broad bean *Vicia faba* L. Turkish, Syrian and Aquadulce were tested to study the fungi associated with seeds. Fungal species which belong to nine genera were identified. The most common pathogenic fungi were *Alternaria alternata* and *Rhizoctonia solani* which occurred at 4-5% in the seeds of the three varieties. Using four isolates, inoculation studies to the three varieties were performed. Isolate No. 4 caused highest incidence and severity, whereas isolate No. 2 was the weakest. Significant differences in the shoot fresh weight was obtained from the inoculated varieties with the isolated fungi, except for isolate No. 2 which showed no difference on Turkish and Aquadulce varieties compared with the control. The isolate No. 4 was the most severe in reducing the shoot fresh weight, with no significant differences on plant height compared with the control. Significant differences in the amount of chlorophyll a, chlorophyll b and chlorophyll (a+b) were found among the inoculated varieties compared the uninoculated control.

R 2

PERFORMANCE OF SOME FABA BEAN GENOTYPES IN RELATION TO INFECTION WITH CHOCOLATE SPOT AND ASCOCHYTA BLIGHT. Majid K. Al-Kummer, College of Agriculture and Forestry, Mosul University, Mosul, Iraq, Email: melkummer@yahoo.com

The reaction of 17 Iraqi faba bean genotypes to Chocolate Spot (*Botrytis Fabae*), and Ascochyta blight (*Ascochyta fabae*) were studied under artificial inoculation conditions, in the field at the International Center for Agricultural Research in the Dry Areas (ICARDA). Results showed that the tested genotypes significantly varied in their reaction to the two diseases. The Iraqi genotypes were classified as moderately resistant to susceptible. Many crossings between selected plants of Iraqi genotypes and resistant varieties was achieved in an effort to produce high yielding variety resistant to these diseases.

R 3

REACTION OF SOME EGYPTIAN AND SYRIAN CHICKPEA CULTIVARS TO *FUSARIUM OXYSPORUM* F.SP. *CICERIS*. Fawzi A. Khalil¹, Ahmed A. Ashour¹, Salah M. Abdel-Momen² and Ismail M. Al-Mohamed³. (1) Plant Pathology Department, Faculty of Agriculture, Cairo University, Egypt; (2) Plant Pathology Research Institute, Agricultural Research Center, Giza, Egypt, Email: salah1993@yahoo.com; (3) Plant Protection Department, Faculty of Agriculture, University of Al-Baath, Homs, Syria, Email: ismail_path@yahoo.com

The reaction of three Egyptian (Giza 1, Giza 195 and Giza 531), and five Syrian chickpea cultivars (Ghab 1, Ghab 2, Ghab 3, Ghab 4 and Ghab 5), to 21 Egyptian isolates of *Fusarium oxysporum* f.sp. *ciceris* (*F.o.c.*) were tested, separately, in a greenhouse. Scores on early wilt, late wilt and rate of plant survival were used as criteria to evaluate the performance of those cultivars. The Syrian cultivars were less susceptible than the Egyptian ones, as their survival rate ranged between 54.39-69.09%, while it was 50.75-59.39% for the Egyptian cvs. The ANOVA indicated that the main effects of cultivars, isolates and their interaction, cultivar × isolate, were highly significant sources of variation for the parameters tested. The interaction between *F.o.c.* isolates and the chickpea cultivars tested suggested the presence of more than one race within *F.o.c.* Egyptian isolates and the nature of resistance of the tested cultivars was a mixture of vertical and horizontal resistance. Similarly, pathogenicity of the isolates tested is also a mixture of virulence and aggressiveness. Three groups of isolates were identified by cluster analysis with no relationship to their geographical origin. The cluster analysis also indicated that four of the five (80%) Syrian cultivars appeared in one cluster, whereas a considerable dissimilarity was observed among the Egyptian cultivars.

R 4

PRELIMINARY EVALUATION OF RESISTANCE TO LENTIL VASCULAR WILT IN LARGE-SEEDED LENTIL. B. Bayaa¹, A. Sarker¹, M. Abang¹, B. Furman¹, A. Bayaa², S. Murad¹, S. Kabbabeh¹, H. El-Hassan¹ and A. Ismail¹ (1) ICARDA, International Center for Agricultural Research in the Dry Areas. P. O. Box 5466, Aleppo, Syria, Email: b.bayaa@cgiar.org; (2) Faculty of Agriculture, Aleppo University, Syria.

Lentil vascular wilt, caused by *Fusarium oxysporum* Schlecht. em. Snyder & Hansen f. sp. *lentis* (Vasudeva & Srinivasan) Gordon is one of the most important diseases affecting lentil production worldwide. The use of host resistance is the most practical and economic mean to manage the disease and to reduce yield losses. Previous work at ICARDA exploited resistance sources in small-seeded red lentil germplasm and several resistant varieties have been released by various national programs. However, sources of resistance in large-seeded green lentil type are scarce and efforts are being made to identify resistant genotypes. A collection of 257 large-seeded lentil accessions including 41 breeding lines and 216 landraces originating from 32 countries were screened in a well-developed *Fusarium* wilt-sick plot at ICARDA main station in Tel-Hadya, Syria. The test lines were evaluated during 2005/06 growing season in 50 cm row plots each sown with 50 seeds following a randomized complete block design with three replications. "Precoz", a susceptible cultivar of Argentine origin was used as check and was planted after every 4 test lines. Disease severity was rated as the percentage of dead plants and was evaluated three times from flowering/podding to maturity at an interval of 7-10 days. The highest rating for each accession, in any of the replications across evaluations, was considered as the final severity score. Accessions with <20% infected/dead plants were considered as resistant. Of the lines tested, 20.6% showed resistant reaction. High level of resistance was found in the materials originating from Chile (41.8%), and Spain (11.5%) followed by breeding lines developed at ICARDA (34%). No resistance was found in the germplasm originating from Iran (0/18 lines) and Syria (0/40 lines), and a very low level of resistance was found in the material from Turkey (1/21). These resistant lines would be re-evaluated in the next season.

R 5

THE LOCALIZATION OF FUSARIUM VASCULAR WILT RESISTANCE ON THE GENETIC LINKAGE MAP OF *LENS* SP. Aladdin Hamwiah¹, Michael Baum¹ and Christian Jung². (1) International Centre for Agricultural Research in the Dry Areas (ICARDA), P.O.Box: 5466 Aleppo, Syria; (2) Plant breeding institute, Universita^t Kiel, Olshausenstrasse 40, Kiel, 24098, Germany.

Lentil is an important leguminous crop and a source of protein for the poor and vegetarian worldwide. *Fusarium* wilt caused by *Fusarium oxysporum* f. sp. *lentis* is one of the most important fungal diseases that can lead to complete crop failure. The present work aimed to develop molecular markers for lentil that might be associated with important agronomic traits. The plant material used consisted of 86 recombinant inbred lines (RILs) that were generated from a cross between a cultivated lentil line (ILL 5588) carrying the resistance gene for *Fusarium* wilt (F_w) and the male susceptible parent (L692-16-1). Field data collected were used in linkage analysis to identify DNA markers linked to the resistance gene F_w . The lines were divided in two groups: resistant (A) when <20 % wilted plants were observed and susceptible (B) when >20 % wilted plants. Two hundreds seventy eight different molecular markers (110 RAPD, 129AFLP, and 39 SSR) were developed and used to construct the linkage map of lentil. The markers distributed over 14 linkage groups, 91 % of them were over 7 major linkage groups. The *Fusarium* vascular wilt resistance (F_w) was localized on LG 6 through linkage mapping, and this resistance gene was flanked by microsatellite marker SSR59-2B and AFLP marker p17m30710 by a distance of 8.0 cM, and 3.5 cM, respectively. Further association analysis confirmed that SSR59-2B locus was linked to F_w but at 20 cM. The development and mapping of microsatellite markers will improve the genetic map of lentil and will allow to localize various loci of agronomic traits across different mapping populations.

R 6

REFINED METHODOLOGY FOR EFFICIENT SCREENING OF CHICKPEA FOR RESISTANCE TO ASCOCHYTA BLIGHT. B. Bayaa, M. Abang, S. Kabbabeh and S. Murad, ICARDA, P.O. Box 5466, Aleppo, Syria, Email: b.bayaa@cgiar.org

Ascochyta blight is one of the most important diseases affecting chickpea worldwide. Host plant resistance is the major control method and is considered as the corner stone of any integrated disease management package. Artificial inoculation is warranted for efficient and reliable screening of chickpeas for Ascochyta blight resistance since inoculum must be applied homogeneously. Field screening typically requires large quantities of spore suspension prepared from fungal cultures grown on synthetic media, which is laborious, time-consuming and expensive, especially for research programs in developing countries. There is a need for alternative, affordable, and efficient inoculum production and application methods. To address the dual issues of affordability and efficiency, a split-split-plot experiment was conducted to refine the current screening methodology with varieties as main plot, inoculum type (spore suspension prepared from fungal cultures on infected seed, infected seed, infected crop debris, and control) as sub plot and inoculum application time (early-, mid-, and late-application) as sub-sub plot. Two chickpea varieties ILC 263 (highly susceptible) and ILC 482 (moderately susceptible to the blight) were used. For disease evaluation, a new index was worked out that took into consideration both disease severity (1-9 scale) and disease incidence (0-100%) in each treatment. There were significant ($P<0.01$) main effects due to cultivar, inoculum type and application time, and a significant ($P=0.03$) cultivar x inoculum type x application time interaction, indicating the importance of choice of inoculum and time of application in screening chickpea for Ascochyta blight resistance. The highest disease indices across cultivars were obtained with infected crop debris at the three application times, followed by the early application of spore suspension. Higher disease indices caused by infected crop debris can be attributed to a continuous supply of inoculum that sustained the epiphytotic throughout the parasitic phase of the disease cycle. The comparative advantages of an early application of infected crop debris in chickpea Ascochyta blight resistance screening are discussed.

R 7

AN INVESTIGATION ON SUSCEPTIBILITY OF TEN LOCAL GENOTYPES OF ANNUAL ALFALFA TO SPRING BLACK STEM DISEASE CAUSED BY *PHOMA MEDICAGINIS* VAR. *MEDICAGINIS*. Nadra Bomediane and Zouaoui Bouznad, Department of Botany, INA, El-Harrach, Algiers, Algeria, Email: sabrina_20725@hotmail.com

Spring black stem of alfalfa caused by *Phoma medicaginis* var. *medicaginis* occurs commonly in Algeria. It causes losses in both forage yield and quality. Disease control depends chiefly on breeding for resistance. Seedling plants and excised trifoliolate leaves of 10 genotypes of local annual alfalfa were inoculated in vitro with two isolates of the pathogen for evaluating their level of resistance. The severity of the disease was measured on single whole plant and on detached leaves using two different scales. All the genotypes developed symptoms of the disease. A significant variation in resistance was observed among species and genotypes. Some tested genotypes showed an acceptable level of resistance.

R 8

DURABLE LEAF RUST RESISTANCE IN SOME EGYPTIAN WHEAT CULTIVARS. O.A. Boulot, Plant Pathology, Research Institute, ARC, Egypt, Email: samee_999@yahoo.com

Wheat leaf rust is considered to be the most widespread rust disease, through most wheat growing areas in Egypt and the world. However, the commercially produced wheat cultivars in Egypt have been developed with field resistance to the three rusts, especially leaf rust. Some of these cultivars were discarded very shortly after their release, because of the rapid break down of its leaf rust resistance *i.e.* Giza 135 and Giza 139. Other cultivars maintained their rust resistance, showing high and acceptable levels of resistance against the most dominant races, under different environmental field conditions in Egypt. Out of these cultivars, twelve were used in this study, to evaluate their levels of partial resistance against leaf rust under two different environmental locations; Nubaria and Etay El Baroud, during three successive seasons; 2002/2003, 2003/2004 and 2004/2005. Over the three years and the two locations, some of the tested cultivars; Giza 168, Sakha 93, Sakha 94, Gemmeiza 9 and Gemmeiza 10, showed high levels of partial resistance. This group of cultivars characterized by the lower levels of final rust severity (FRS%), which did not exceed 20%, were characterized by slower rate of disease increase and lower values of area under

disease progress curve (AUDPC). Whereas the other group of tested cultivars were fast rusting ones (Giza 160, Sakha 69, Sakha 92, Gemmeiza 7, Sids 1 and Sids 12) and showed higher levels of rust severity (%), faster rates of disease increase (r-value) and higher values of AUDPC, compared to the slow rusting cultivars, under field conditions. In order to determine the presence and number of the probable genes responsible for seedling resistance to leaf rust in the tested wheat cultivars, comparisons were made between the rust reactions (infection types) of these cultivars and 47 monogenic lines (Lr's), against 28 isolates of *Puccinia triticina*. High numbers of leaf rust resistance genes ranged from 7 to 25, were probably present in the partially resistant cultivars Giza 168, Sakha 93, Sakha 94, Gemmeiza 9 and Gemmeiza 10. Whereas, the fast rusting cultivars had few number of resistance genes. Moreover, the fast rusting cultivar Sids 1 had no resistance genes. The accumulation of resistance genes in any wheat cultivar, enables it to delay the spread of disease and reduce the inoculation potential during an epidemic. At the same time, resistance in such cultivars is usually expected to be more durable, under different environmental conditions.

R 9

DETACHED SEEDLING LEAVES AS A PROMISING TECHNIQUE TO SCREEN DURUM WHEAT FOR RESISTANCE TO *STAGONOSPORA NODORUM*. Abdelhamid Ramadani¹ and Patrice Halama². (1) INRA-CRRA-Meknes, Morocco; (2) ISA, Lille University, France, Email: ramhamid@hotmail.com

The resistance level of 12 durum wheat cultivars (*Triticum durum*) to septoria glume blotch disease caused by *Stagonospora nodorum* was assessed using the detached seedling leaves technique. This technique proved to be reliable in detecting the differences in resistance level between cultivars. Oumrabia and Kyperounda were the most susceptible in contrast to Marzak, Isly and Ourgh that were the most resistant cultivars. A large genetic variability between the tested cultivars was detected regarding in relation to the necrotic and chlorotic leaf are produced. These two components of partial resistance were strongly and positively correlated ($r = 0.71$, $p = 0.01$).

R 10

THE EFFECT SPECIFIC RACES OF YELLOW RUST ON BREAD WHEAT AND COMPARATIVE RESISTANCE OF SEEDLING AND ADULT STAGES. Shoula Kharouf¹, Amor Yahyaoui², Fawaz Azmeh¹, shafike Hakim³ and Maha Al-Ahmed². (1) Faculty of Agriculture, Damascus University Damascus, Syria; (2) ICARDA, P.O.Box 5466, Aleppo, Syria; (3) Faculty of Agriculture, Aleppo University, Aleppo, Syria, Email: shoulakharouf@yahoo.com

Yellow or stripe rust, caused by *Puccinia striiformis* west. f.sp. *tritici*, is the most widespread rust disease in the cool and humid wheat growing areas. In Syria, it is an important disease in the Northern and Northeastern area of the country and in irrigated fields. In wheat, it can induce considerable losses, particularly in rainy seasons. 41 cultivars and races were planted in a split plot and inoculated by bulk urediniospores. In the first season, two races 38E150 and 230E150 were used, whereas in the second season, the races 230E150 and 6E16 were used. Reaction type and disease severity were assessed at heading stage, average coefficients of infection (ACI) and area under disease progress curve (AUDPC) at adult stage were determined. Genotypes varied in their susceptibility, to yellow rust at the seedling or the adult stages. The cv. Jupateco73S was susceptible to infection at both stages, whereas cv. Sardari was resistant at both stages. The cv. Corella was susceptible at the seedling stage and resistant at the adult stage, whereas cv. Avost was to the contrary, resistant at the seedling stage and susceptible at the adult stage.

R 11

SELECTION OF FUSARIUM WILT RESISTANT TOMATO PLANTS BY TISSUE CULTURE. N.A. Ramadan¹, M.K. Al-Mallah² and A.M. Bdulla². (1) Department of Biology, College of Science, University of Mosul, Mosul, Iraq; (2) Department of Biology, College of Education, University of Mosul, Mosul, Iraq, Email: dr_mozahimkassim@yahoo.com

Callus formation was stimulated from stem explants of tomato seedlings on agar solidified MS media supplemented with growth regulator. Stem explants showed best response followed by leaves. Root explants failed to induce callus. Medium containing 2.0 mg/l kinetin, 2.0 mg /l Naphthalen acetic acid (NAA) was the most favorable medium for callus induction from stem. Selection of resistant callus to the

virulent strain of *F. oxysporum* and *F. solani* were carried out from culture medium that contained different concentration (2.5, 5, 10 and 20 %) of filterates. Typical concentration which allowed selection were 15-20%. Regenerated tomato plants from stem callus resisted the toxic effect of *F. oxysporum* and *F. solani* filterates, although regeneration ability of the resistant callus was reduced by up to 30%, compared with the control. The chromosome number assay showed that the resistant tomato plants had lesser number of chromosomes when matched with the different untreated plants obtained from seed or callus. Tomato plants regenerated from callus tolerating toxic filterates exhibited resistance when invaded with these virulent fungi.

R 12

EVALUATION OF FABA BEAN CULTIVARS FOR RUST AND POWDERY MILDEW RESISTANCE UNDER IRRIGATED AND RAINFED CONDITIONS IN THE SOUTHERN HIGHLAND OF YEMEN. Y.A.A. Molaaldoila¹ and A.A. Al-Shami². (1) Department of Agronomy, Southern Upland Research Station, Taiz, P.O. Box 5788, Yemen, Email: yaldoila@yahoo.com; (2) Department of Plant Protection, Southern Upland Research Station, Taiz, P.O. Box 5788, Yemen, Email: alshamiar@yahoo.com

During the period 2003-2005, eight faba bean cultivars, showing low to high susceptibility to *Uromyces viciae-fabae* and *Erysiphe polygoni* were evaluated under natural infection conditions in the irrigated and rainfed seasons at the southern highland region, Yemen. The tested cultivars included five faba bean breeding lines developed at ICARDA (R-27, A-87, R-62, A-86, FBV2), a new line selected from the variety R-27 based on rust resistance during the first season, and two local control cultivars. *Uromyces viciae-fabae* was the major pathogen in the rainy season, whereas *Erysiphe polygoni* was a major pathogen in the irrigated season. Variance analysis of data on disease severity revealed significant differences among cultivars in their reaction to rust and powdery mildew. Among cultivars, the new selected line was consistently low rusting and intermediate to powdery mildew in comparison to the other genotypes, which were intermediate to susceptible for both diseases. Highly significant genotypic differences were observed for biomass production, pod and seed yield, pod and seed number per plant, 1000 pod and seed weight per plant, harvest index and nodule formation. The new selected line was superior in yield in both seasons followed by R-27 and A-87.

R 13

FORMATION OF RESISTANT PLANTS FOR SOFT AND BLACKLEG ROT CAUSED BY ERWINIA FROM CALLUS OF POTATO (*SOLANUM TUBEROSUM*) STEMS. Hana S. Saleh and Nadeem A. Ramadan, Biology Department, College of Science, Mosul University, Iraq, Email: nadeemramadan@yahoo.com

The study aimed to produce resistant potato plants to *Erwinia* that caused soft and blackleg rot of potato, by using potato tissue culture. Callus was initiated from stem explants cultured on MS medium supplemented with NAA and IBA as auxins and BA as cytokinin. The results showed that MS medium with addition of 1.0 mg/l of each of NAA and BA was the best in stimulating callus initiation, followed by selection of resistant callus to bacteria and then cultured on MS medium which contained IBA and BA for regeneration of shoots, which were then rooted and transferred to environmental condition for adaptation. The study also included a comparison between the resistant plants and those of the control treatment by investigating their morphological features and chromosome numbers.

R 14

INDUCING RESISTANCE AND EXTENDING STORAGE LIFE OF STRAWBERRIES BY FOLIAR APPLICATION OF CALCIUM SALTS. Saneya M. El-Neshawy¹, Abd El-Ghany Badr², Hussein Roshdy Abd El Aal² and Hamam El-Din Heniesh Younes¹. (1) Department of Post Harvest Diseases, Plant Pathology Research Institute, ARC, Orman 12619, Giza, Egypt, Email: el_kholi@yahoo.com; (2) Department of Plant Pathology, El-Azhar University, Cairo, Egypt.

The pre harvest spray application of calcium salts (i.e. CaCl₂, Ca(NO₃)₂, CaSO₄) each at 3, 5 and 10 g/l and CaSiO₃ at 2,4 g/l on strawberry cvs. Camarosa, Rosalinda, Shandler, and Sequoia caused significant reduction in rate of infection caused by post harvest pathogens i.e. *Botrytis cinerea*, *Rhizopus*

stolonifer, *Phytophthora cactorum* and *Alternaria alternata* as well as restriction in visual rating of mould development (VRMD) on strawberries 32 days after cold storage. The greatest effect was obtained when utilizing CaCl₂ on cv. Camarosa followed by other salts. However, slight effect on the growth of post harvest pathogens occurred *in vitro* due to calcium salts effect. Significant effect on maintenance of fruit ripening characteristics (FRC) i.e. firmness, soluble solid content (SSC%), vitamin C (VC), titratable acidity (TA%), and color density (CD) occurred due to calcium salt treatments that helped in delaying the fruit ripening and prolonging the storage life. Two fold increase in flesh calcium content in strawberries (cvs. Camarosa, Rosalinda, Shandler) cell wall resulted due to the pre-harvest application of CaCl₂, and CaSiO₃ compared to non treated berries. Moreover, scanning electron microscope (SEM) showed calcium accumulation on cell wall of strawberries (cv. Camarosa) due to pre-harvest application with Ca Cl₂ at 5g/l.

R 15

EFFECT OF SOME NUTRIENT ELEMENTS AND SALICYLIC ACID ON SYSTEMIC RESISTANCE OF CUCUMBER PLANTS TO *PYTHIUM APHANIDERMATUM*. Alaa K.Hassan and Saleh H. Samir, Pesticide Laboratory, College of Agriculture, University of Baghdad, Iraq, Email: salehsamir2004@yahoo.com

This study was conducted at the College of Agriculture, University of Baghdad to evaluate resistance of cucumber damping off caused by *Pythium aphanidermatum* (Edson) Fitz by using salicylic acid, copper and silicon elements. Laboratory results showed that copper was strong inhibitor to growth of *P. aphanidermatum* (83.6%) when it was applied at the rate of 25 mg/l, whereas the rate of growth reduction reached 81.9% by using silicon at the rate of 400 mg/l. Results revealed that salicylic acid, copper and silicon elements significantly reduced damping off disease severity to 0.0, 3.3 and 3.3% respectively, whereas disease incidence was reduced to and 15.0, 0.0 and 6.6%, respectively, compared to the control treatments 76.6 and 83.3%, respectively.

R 16

EVALUATION OF STEM SWEET PEPPER (*CAPSICUM ANNUUM*) RESISTANCE AGAINST *PHYTOPHTHORA CAPSICI*. Abdelhadi Guechi¹ and Messaouda Benabdelkader² (1) Laboratory of Microbiology and Phytopathology, Faculty of Science, Ferhat Abbas University, Setif 9000, Algeria; (2) Department of Ecology, Jijel University, Algeria, Email: yamina_messaouda@yahoo.fr

In order to select sweet peppers cultivars resistant to *Phytophthora capsici* strains isolated from different areas in Algeria, a quantity active test was used to evaluate the necrosis extent throughout the stem. The evaluation was done each three days, during a period of 15 days after infection. Positive response toward *Phytophthora capsici*, with significant differences, was recorded in all tested cultivars. Cultivar "Italico" was the most resistant, whereas the cv. "Esterele" was the most susceptible. We suggest multiplying the resistant cultivar "Italico" by self pollination, because of its suitable morphological characteristics for the consumer. At the same time research for other resistant sources against this disease (necrosis) should be continued under different environmental conditions.

R 17

ASSESSMENT OF SUSCEPTIBILITY OF SOME *CUCURBITA* ROOTSTOCKS TO *FUSARIUM OXYSPORUM* F. SP. *NIVEUM*, THE CAUSAL AGENT OF WATERMELON WILT IN SYRIA, AND THEIR EFFECTS ON YIELD AND QUALITY OF GRAFTED CULTIVARS. L. Matrod¹, S. Al-Chaabi¹, H. Jarous² and J. wahbeh². (1) Plant Protection Administration; (2) Joseih Al-Khrab Scientific Agricultural Research Center, GCSAR, Douma, P.O. Box 113, Damascus, Syria, Email: gcsarshaabi@mail.sy

The susceptibility of some imported *cucurbita* rootstocks, such as: Strong Tosa (*Cucurbita maxima* X *Cucurbita moschata*), Emphasis (*Cucurbita lagenaria* F1), Sun Hybrid 6001 F1, and some landraces rootstocks, such as: giant pumpkin (*Cucurbita maxima*), bottle gourd (*lagenaria siceraria* and *L. longissima*), sponge gourd (*Luffa cylindrica*), colocynth (*Citrullus colocynthis*) and squash (*Cucurbita pepo* pyriform) to *Fusarium oxysporum* f. sp. *niveum* (Race 2) was evaluated. All tested rootstocks were resistant to the pathogen, with the exception for *C. colocynthis* which was highly susceptible. The compatibility

percentages between used rootstocks and some common watermelon cultivars (cvs.), such as; Buity seed, Crimson Tide, Crimson Sweet, Dumara and Sakata ranged between 35 and 85% under glasshouse, and between 64.8 and 98.2% under plastic tunnel conditions. *L. siceraria*, *L. longissima* and *Lagenaria* hybrid had the highest compatibility potential (85.7-98.2%), whereas *C. maxima* had the lowest (64.8-65.7%), 11 days after grafting. All grafted watermelon cvs. were resistant or tolerant to disease in comparison with ungrafted cvs. under artificial infection in glasshouse or under field conditions. The highest percentage (62.1%) of branches number per grafted plant was recorded in Crimson sweet/*L. longissima* combination-2003. The average increase in grafted plant length, fruit weight and fruits number per one grafted plant were increased compared to those of ungrafted plants, and ranged between 0.0 (Crimson Tide/*C. maxima* combination-2002) and 80.3% (Crimson Tide/*L. longissima* combination-2002), 1.1% (Crimson Tide/*L. cylindrica* combination-2004) and 136.4% (Buity seed/*L. longissima* combination-2002), 23.8% (Crimson sweet/*L. cylindrica* combination-2004) and 119.5% (Crimson sweet/*L. longissima* combination-2003). The influence of tested rootstocks on fruit quality of grafted cvs. varied, mainly in rind thickness, the percentages of net fruit flesh produced by grafted plants were lower than ungrafted cvs., mainly onto *C. maxima*. No significant variation was observed in water, dry matter or in ash contents of fruits. Total sugar content of fruits produced by grafted watermelon cvs., such as Sakata or Crimson Sweet, was positively affected by some rootstocks, such as *Lagenaria* hybrid-2003, but negatively affected by using other combinations.

R 18

EVALUATION OF RESISTANCE OF DATE PALM HYBRIDS TO BAYOUD DISEASE USING INOCULATION AND TOXINS OF *FUSARIUM OXYSPORUM* F.SP. *ALBEDINIS*. Mouna Kassami¹ and Moulay Hassan Sedra². (1) Laboratory of Phytopatology Genetic and Integrated Control, National Institut of Agronomique Researches (INRA), Marrakech, Morocco, Email: moni216@yahoo.com; (2) Arab Organisation for Agricultural Development (INRA) Marrakech, Morocco, Email: sedramh@hotmail.com, mhsedra@yahoo.fr

Date palm has great socioeconomic importance in the Arab countries. Unfortunately, date palm is attacked by bayoud, a disease caused by *Fusarium oxysporum* f.sp. *albedinis*, which contributed to the destruction of 13 million date palm trees in Morocco and Algeria. The best available mean to limit the spread of this disease is the use of host plant resistance. Resistance to the disease was evaluated by using the fungus inoculum, and compared with the toxins it produces. Results revealed that 70% of the varieties were sensitive to the toxin and 30% were resistant. These varieties were among a large number of hybrid varieties obtained through specific crosses.

R 19

SURVEY OF THE GENETIC VARIABILITY OF *FUSARIUM OXYSPORUM* F.SP *ALBEDINIS*, THE CAUSAL AGENT OF BAYOUD DISEASE OF DATE PALM. Youssef El Hilali Alaoui¹ and Moulay Hassan Sedra². (1) Laboratory of Phytopathology, Genetics and Integrated Control, Centre Régional de Marrakech INRA, Marrakech, Morocco, Email: hilalialaoui@yahoo.fr; (2) Arab Organisation for Agricultural Development (INRA) Marrakech, Morocco, Email: sedramh@hotmail.com, mhsedra@yahoo.fr

The Bayoud, vascular disease of date palm caused by *Fusarium oxysporum* f.sp. *albedinis* is the most dangerous, disease of date palm groves in North Africa. This survey is part of a project to control the bayoud disease in the Arabian countries, with support from the Arab Organization for Agricultural Development. The main objective is to determine the genetic variability of *F. oxysporum* f.sp. *albedinis*. Several visits were made to date palm groves to collect infected samples. The DNA of 100 isolates was purified in the laboratory, and was used for genetic variability studies, and by employing molecular tools. Results obtained on the genetic diversity of *F. oxysporum* f.sp. *albedinis*, in relation to geographical location in the Arab countries will be presented.

R 20

RANDOM AMPLIFIED POLYMORPHIC DNA (RAPD) MARKERS IN DATE PALM: STUDY OF RESISTANCE TO *FUSARIUM OXYSPORUM* F.SP. *ALBEDINIS*. Mouna Kassami¹ and Moulay Hassan Sedro². (1) Laboratory of Phytopathology Genetic and Integrated Control, National Institut of Agronomique Researches (INRA), P.O. Box 533, Marrakech, Morocco, Email: k_moni216@yahoo.com; (2) Arab Organization of Development and Agriculture (INRA), Marrakech, Morocco, Email: sedramh@hotmail.com, mhshedra@yahoo.fr

The vascular wilt of date palm known as Bayoud disease is caused by the fungus *Fusarium oxysporum* f.sp. *albedinis*. The bayoud is the most serious infectious disease of palm date, and his impact is very serious in North Africa, especially Algerian and Moroccan oasis where losses are increasing and making a threat to date palm-groves in the nearby countries. However, the development and application of new technologies such as RAPD can be useful to identify molecular markers linked to gene for specific resistance to *F. oxysporum* f.sp. *albedinis*. We have applied this technique, using 72 primers and the study was performed on seedlings of two varieties known to be susceptible to Foa and two varieties known to be resistant. Of the 72 primers screened, 41 produced a mono and polymorphic RAPD bands and 31 did not produce any amplification product. The RAPD technique produced very different genetic profiles between susceptible and resistant plants. This study will be applied to other date palm varieties with different reactions to the disease.

R 21

SELECTION OF NEW DATE PALM VARIETIES WITH GOOD AGRICULTURAL CHARACTERS AND PROMISING TO CONTROL THE BAYOUD DISEASE IN MOROCCO. Moulay Hassan Sedra, Arab Organization for Agricultural Development (AOAD), and Institut National de Recherche Agronomique (INRA), Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech INRA, Marrakech, Morocco, Email: mhshedra@yahoo.fr, sedramh@hotmail.com, sedramh@menara.ma

The Bayoud disease, caused by *Fusarium oxysporum* f.sp. *albedinis*, is among plant diseases which are difficult to control. Control by the use of the resistant date palm varieties is until now the most promising method to control this disease in contaminated areas. During the 1970s, in Morocco, the spread of resistant varieties was limited, because such varieties lacked the quality of dates wanted by consumers. The research undertaken concerning genetic improvement permitted the selection of cultivars and clones that has the date palm quality of the fruit and resistance towards the Bayoud disease. Eight female and two male promising clones were identified and characterized. The performance of this genetic material showed that these new clones had some agro-morphological characters more desirable than those of the main Moroccan common varieties. These clones wanted by the consumers deserve to be multiplied on a large scale to reconstitute palm groves ravaged by the Bayoud disease, but also to replant the traditional palm groves with poor production, in quantity and quality.

R 22

USE OF DATE PALM SUSPENSION CULTURE OF GAMMA IRRADIATED CALLUS IN ORDER TO SELECT BAYOUD RESISTANT PLANTS. Ali Mahjoub¹, Lotfi Fki¹, Riadh Drira¹, My Hassan Sedra² and Nouredine Drira¹. (1) Laboratory of Plant Biotechnology, Applied to the Improvement of Cultures, Faculty of Sciences of Sfax 3018, PB 802, Tunisia, Email; a_almahjoub@yahoo.fr; (2) Regional Center of Agronomic Research, Laboratory of Plant Pathology, PB533, Marrakech, Morocco.

Date palm, an essential component of the saharan and sub-saharan agriculture, is today seriously threatened by Bayoud disease caused by the fungus *Fusarium oxysporum* f. sp. *albedinis* (Foa). This fungus causes important damages in neighboring countries i.e. Morocco and Algeria. *In vitro* culture techniques can be a good alternative resolving several problems related to improvement programs. This study evaluate the potential of the date palm *in vitro* culture of gamma rays mutagenised callus for the selection of Bayoud resistant mutants. In addition to the selection among somatic vitroplants, the selection through embryogenic cellular suspensions offers better prospects to accelerate the program and to study date palm-Foa *in vitro* interactions. Thus, we associated to the selection of the first Bayoud putative resistance some molecular and

biochemical analysis in order to identify potential markers of resistance and to understand this phytopathogenic system, whose several aspects remain unknown.

R 23

STUDY OF THE SENSITIVITY OF SEVEN VARIETIES OF POTATO CULTIVATED TO THE ROOT-KNOT NEMATODES IN ALGERIA. M. Hammache, Agronomic National Institut, El-Harrach, Algiers, Email: hammachem@yahoo.fr

The development of potato culture together with other plants crops susceptible to root-knot nematodes (*Meloidogyne incognita*, *M. arenaria* and *M. javanica*) made the situation difficult to manage, because these conditions permit nematodes to multiply and have more generations and consequently cause a massive infestation of the crops. The first test included 7 potato varieties cultivated in Algeria; Désirée (susceptible), Safrane, Arinda, Margarita, Spunta, Atlas and Timate. The plants were grown in small transparent plastic cups, 5 cm in diameter and 8 cm height. The substrate used was moistened sterilized soil to water allow the rooting of the buds. The inoculum of infesting larvae was 300 L2 per cup and 10 cups for each variety. The results obtained after three months and in comparison with the Désirée showed that all the varieties were susceptible to the nematodes. The formation of knots on the roots was calculated on the basis of Wales scale as follows: Désirée 83.5, Arinda 6.3, Margarita 18.1, Spunta 19.66, Atlas 19.3, Timate 7.3 and Safrane 33.34. This result was obtained on an average root weight of 1.99, 0.45, 1.47, 0.23, 1.31, 0.87 and 0.86 g, respectively. The results showed us a proportionality of the number of females compared to the number of knots with significant differences between the variety Désirée (64.1) and other varieties such as Arinda (2.3), timate (3.3), Margarita (8), and Spunta with an average of 11.7 females. The Safrane variety introduced lately showed an average number of females of 36.09. The varieties tested seemed to be a good host for the nematodes especially in the littoral area.

R 24

SUSCEPTIBILITY OF SOME COWPEA (*VIGNA UNGUICULATA* (L.) WALP) GENOTYPES TO INFESTATION WITH CERTAIN PIERCING-SICKING PESTS IN UPPER EGYPT. Nashat A. El-Hafiz¹ and A. M. Damarany². (1) Plant Protection Research Institute, Agriculture Research Center, Egypt, Email: nashat_hafiz@yahoo.com; (2) Department of Horticulture, Faculty of Agriculture, Assiut University, Egypt.

The susceptibility of five cowpea cultivars (Pinkeye, Tvu-21, Six-Weeks, Ch-Reds and B-Crowder) for infestation by the main sucking pests [whiteflies *Bemisia tabaci* (Gannadius), Thrips (*Thrips tabaci* Lind), Jassids (*Empoasca discipinen* Padi), Aphids (*Aphis craccivora* Koch) and Spider mites (*Tetranychus urticae* Koch)] in northern upper Egypt at Assiut Governorate during the two successive seasons of 2001 and 2002 were evaluated. Results revealed that the highest pests' density was recorded on Tvu-21 cultivar. However, the lowest density was recorded on Six-Weeks and B-Crowder cultivars. Because the relative susceptibility of the tested cultivars to these pests, Six-Weeks and B-Crowder appeared to be resistant cultivars. However, Pinkeye and Ch-Reds showed low levels of resistance, whereas the Tvu-21 cultivar appeared to be susceptible. Results also showed that Tvu-21 was susceptible to *Aphis craccivora*. There were no significant differences in number of pods/plant and seeds/pod among the Malathion-500 treated and non-treated plots. Tvu-21 cultivar produced the highest 1000-seeds (g) weight in both seasons. On the other hand, the effects of 7 cowpea cultivars (Pinkeye, Tvu-21, Six-Weeks, Ch-Reds, B-Crowder, Balady and IT82D889) tested on development time, longevity and fecundity of *T. urticae* were evaluated at 25°C. Ch-Reds and IT82 D889 had the shorter life span of *T. urticae* than the other cultivars. Mites reared on Tvu-21, Pinkeye and IT 82 D889 had the highest fecundity (17.22, 16.22 and 15.75 eggs/female, respectively). The mites reared on Ch-Reds had the shorter life span (16.33 days). Based on the results obtained it was concluded that the Tvu-21 and Pinkeye cowpea cultivars were the most preferred hosts for the tested pests and Six-Weeks and B-Crowder cultivars were the least preferred.

R 25

INDUCING RESISTANCE OF COTTON PLANTS (*GOSSYPIUM BARBADENSE* L.) TO BOLLWORM INFESTATION WITH PLANT GROWTH REGULATORS. M.A. Makady, M.A. Ali, F.K. Ali and A.S. Hussein, Plant Protection Department, Faculty of Agriculture, Minia University, Egypt, Email: makady51@yahoo.com

An experiment was carried out to evaluate the role of plant growth regulators (PGRs) in inducing resistance of cotton plants to bollworm infestation at the experimental farm of the Faculty of Agriculture, Minia University, Egypt during 2002 and 2003 growing seasons. Pix mipiquate chloride (MC) and cycocel chlormequate chloride (CCC) were used as foliar spray at flower bud formation and the beginning of flowering at the rate of 250 ml/fed. Their efficiency on flowering, bollworm infestation, yield and economic loss as a function of bollworm infestation were determined. The effect of these compounds on the total numbers of beneficial insects was recorded. Results showed that treatment cotton plants with PGRs increased the total number of flowers, reduced the rate of bollworm infestation by 29.2 and 26.49%, increased the actual yield with average 24.51% and 10.45% over the control in the two successive years, respectively, and reduced the economic loss. Results also showed that the application of pix and cycocel has been extremely successful in inducing resistance of cotton plant to bollworm infestation, increased the total number of beneficial insects and reduced the rate of diapausing larvae of pink bollworm in cotton field. It can be concluded that Pix and Cycocel could be useful component in cotton pest management strategies. However, slight phytotoxicity was observed in plots treated with cycocel.

R 26

RESPONSE OF SOME IMPROVED BARLEY CULTIVARS TO CORN LEAF APHID INFESTATION (*RHOPALOSIPHUM MAIDIS* FITCH). Abdul-Sattar A. Ali, Jasim K. Mohammed, Bahaa A. Al-Rawi and Hatam Mutiab, State Board for Agricultural Research, P.O. Box 39094, Abu-Ghreib, Bagdad, Iraq, Email: abdulesattararif@yahoo.com

Corn leaf aphid (*Rhopalosiphum maidis* Fitch.) (Aphididae: Homoptera) is considered as an important pest attacking barley and transmitting virus diseases to the crop in Iraq. The main cause of damage is due to the feeding of such pest on the plant sap, which might transmit some plant viruses. Field and laboratory studies were conducted to evaluate the response of some locally improved barley cultivars to aphid infestation during 2002-2006 growing seasons. The influence of these cultivars on some biological characteristics of aphid was also studied. Results indicated that all barley cultivars were infested by this aphid species. However, the cultivars IPA 267, Reehan and IPA99 showed higher aphid density per plant compared to other cultivars. The lowest density of aphids was recorded on the cultivar 22-24. Laboratory studies showed that this cultivar was also a less preferred host for aphid development. Female longevity and progeny production was reduced when aphid individuals fed on this cultivar. There were no effects of aphid infestation on growth and morphology of investigated cultivars.

R 27

STUDY OF THE SENSITIVITY OF SOME LOCAL WHEAT AND BARLEY VARIETIES TO INFESTATION WITH CEREAL APHIDS IN AL-JABAL AL-AKHDAR REGION, LIBYA. Hanna S. El-Aish¹, I. M. El-Ghariani² and A. H. Al-Mabruk². (1) Biology Department, Faculty of Science, Garyounis University, Al-Maraj, Libya; (2) Plant Protection Department, Faculty of Agriculture, Omar Al-Mukhtar University, P.O. Box, 99 El-Beida, Libya, Email: ghariani99@yahoo.com

The study aimed to evaluate the reaction of some local varieties of wheat and barley to cereal aphid infestation. The results revealed that the barley varieties Wadi El-Gattara, Libya 4 and Wadi Zert were more tolerant to the cereal aphid infestation than wheat varieties Kareim, Solid and Soft. The average field number of aphids on barley were 5.4, 3.9, 3.9, 4.9, 5.7 and 16.9 compared with the number on wheat varieties which were 13.0, 19.3, 11.4, 16.4, 16.5, 27.3 and 15.1 for the two seasons 2001/2002 and 2002/2003, respectively. The mean numbers of aphids on barley varieties in the laboratory were 4.4, 3.7, 8.5, 4.3, 3.6 and 7.1 compared with the aphid mean numbers on wheat which were 36.4, 53.8, 27.7, 11.3, 15.2 and 9.8 for the same two seasons, respectively. The results showed that there were significant differences on the degree of sensitivity between the varieties. Hard wheat was more sensitive followed by wheat Kareim, whereas among barley varieties, Wadi Gattara and Libya 4 were the least sensitive to

infestation. This research also showed that the aphids *Ropalosiphum padi* and *Schizaphes graminum* were more common than *Sitobian avenae*. In addition, the *R. padi* was more attracted to Solid wheat and Kareim wheat than other varieties while *S. graminum* and *S. avenae* had high preference to Solid wheat, Soft wheat and Wadi Zert barley. The presence of aphids on the plant parts differed from one time to another, depending on the plant growth. The estimation of aphid population densities showed that no significant difference between spikes and stems at the beginning of the infestation, however, after 2nd and 3rd week the numbers on spikes were more than on stems. The data also showed that *R. padi* preferred to feed on stem and lower leaves more than spikes, and *S. graminum* and *S. avenae* preferred to feed on spikes.

R 28

EVALUATION OF A COLLECTION OF *LENS CULINARIS* MEDIKUS SUBSP. *ORIENTALIS* BOISS FOR RESISTANCE TO *SITONA CRINITUS* HERBST. Mustapha El-Bouhssini, Abdullah Joubi and Ashutosh Sarker, ICARDA, P.O. Box 5466, Aleppo, Syria, Email: a.joubi@cgiar.org

The lentil weevil *Sitona crinitus* Herbst., is one of the important insect pests attacking lentil. The adults feed on the leaflets and the larvae feed on the fresh root system, and on the nodules, thus decreasing the ability of atmospheric nitrogen fixation. Since it wasn't possible to find sources of resistance to this pest in the cultivated lentil *Lens culinaris* Medik., we evaluated a collection of *Lens orientalis* Boiss., available at the Genetic Resources Unit at ICARDA. We screened 315 accessions of *Lens orientalis* Boiss for resistance to Sitona. This screening was made at Tel Hadya, ICARDA experimental station, under natural conditions. Each accession was sown unreplicated in one row, one meter long. Promising accessions were re-screened under the same field conditions the next season, but in four replications. The evaluation for resistance was based on nodule damage. A random sample of five plants with their roots/soil was taken from each accession and was immersed in water for one day, and then the roots were washed. The total numbers of nodules and the numbers of damaged ones were counted. The results showed large variation in the percent nodule damage among accessions, which ranged from 0% for ILWL-183, originated from Syria, to 84% for ILWL-313, originated from Turkey. Eight accessions (ILWL 110, 136, 166, 203, 207, 245, 254 and 258) were selected with 10% or less nodule damage, and these will be used as sources of resistance to develop cultivars with resistance to *Sitona* weevil.

R 29

SOURCES OF RESISTANCE TO HESSIAN FLY (*MAYETIOLA DESTRUCTOR* SAY) IN SYRIA. Mustapha El-Bouhssini, Fawzi Rihaoui, M. Nachit, J. Valkoun and O. Abdallah, ICARDA, P.O. Box 5466, Aleppo, Syria, E-mail: f.rihawi@cgiar.org, M.Bohssini@cgiar.org

The Hessian fly is a major destructive pest of wheat in North Africa, South Europe, North America and North Kazakhstan. It is believed that this pest has the same origin as wheat, which is West Asia. The Syrian Hessian fly has been found to be the most virulent biotype worldwide. This biotype has been used at ICARDA in screening wheat and its wild relatives to identify new sources of resistance. The screening is conducted in an insect rearing room set at 20°C and 70% RH, using a Hessian fly population collected from Lattakia region. The experimental design used is a randomized complete block with four replications. 'Nasma' and 'Cando' are used as susceptible and resistant checks, respectively. A total of 701 lines and accessions of wheat and its wild relatives (*Aegilops* and *Triticum*) were evaluated. 28 *Aegilops* accessions and four synthetic wheat lines were found resistant. The presence of dead first instars confirmed the resistance reaction and also showed that antibiosis is the major mechanism of resistance in these materials. These sources of resistance will be used in the wheat breeding programs for the development of Hessian fly resistant germplasm/varieties.

R 30

MECHANISMS OF RESISTANCE TO SUNN PEST *EURYGASTER INTEGRICEPS* PUT. IN SOME WHEAT LINES AND WILD RELATIVE ACCESSIONS. Lina Ali¹, M. El-Bouhssini² and M.N. Al-salty¹ (1) Department of Plant Protection, Faculty of Agriculture, Aleppo University, Aleppo, Syria; Email: lina7755@hotmail.com; (2) International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box 5466, Aleppo, Syria; Email: M.bohssini@cgiar.org

Sunn pest *Eurygaster integriceps* Put. (Hemiptera: Scutelleridae) is a major insect pest of wheat in West and Central Asia. However, sources of resistance to Sunn pest in wheat lines and wild relatives at the

vegetative stage have been identified. A study was conducted to determine the mechanisms of the resistance. Two preference tests were conducted, one consisted of resistant lines/accessions of bread wheat, durum wheat and *Aegilops* along with a susceptible line/accession from each species. The other comprised only the resistant lines/accessions. Six Sunn pest adults were used to infest each cage measuring 1 m³. Evaluation of preference/non-preference was based on the number of eggs laid per entry and the damage caused through feeding. The susceptible wild accession IG119444 had the highest infestation (5.6%) and stunting (5.1%), while the lowest (1% for both infestation and stunting) was in *Aegilops umbellulata* (IG48404). The two susceptible checks, IG48404 and bread wheat Cham 6, had the highest number of egg masses (two each), but there were no eggs on the resistant accession IG48404. Infestation, stunting, and number of egg masses were 3.7%, 2.5%, and 2.4%, respectively, in the bread wheat ICBW from Afghanistan, and it was the highest. The resistant *Aegilops* accession IG48404 also had the lowest infestation (1.3%) and stunting (0.1%) with no eggs laid.

R 31

EVALUATION OF SOME MAIZE VARIETIES FOR ATTACK BY STEM BORER. Mohamad Al-Allan¹, Adel Almanoufi¹ and Majeda Rwallo². (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Douma, P.O. Box 113, Damascus, Syria, Email: allan@shuf.com, adel-agro@mail.sy; (2) Deir El-Zor Agricultural Research Center, Syria.

This study was conducted in Deir El-Zor Agricultural Research Center, Almraaia station for the evaluation of some maize varieties developed by GCSAR. The experiments showed that Basel 2 was the most sensitive for infestation by *Sesamia cretica*, followed by Basel 1, Gota 1 and Gota 82, respectively. The rate of infested plants was significantly higher at 56 days old compared with 39 days old plants and remained steady until harvest.

Integrated Pest Management

IPM 1

INTEGRATED MANAGEMENT APPROACHES STRATEGIES FOR CONTROLLING CERTAIN COTTON KEY PESTS IN MIDDLE EGYPT. Ahmed A. Amin and Malak F. Gergis, Plant Protection Research Institute, ARC, 7 Nady El-Sayied Street, Dokki, Giza 12311, Egypt, Email: aahakaa@yahoo.com

In Egypt, insect pests attack reduced yield and quality of cotton, and oil content in the seeds. The cotton leaf worm (*Spodoptera littoralis*), the cotton pink bollworm, (*Pectinophora gossypiella*) and spiny bollworm (*Earias insulana*) cause the greatest damage in nearly one million feddans cultivated annually. This study describes an improvement in insect control practices directed against feeding insects (i.e., *S.littoralis*, *P. gossypiella* and *E. insulana*) by integration of insect monitoring, biological control, cultural, behavioral and genetic approaches that can serve as a base for the formulation of biologically- based new approach of integrated management of cotton key pests. Field studies were conducted during 2004 and 2005 cotton seasons at Minia Governorate, middle Egypt, with an experimental area of about 150 feddans of cotton (Giza 80). Five control measures were evaluated: (1) Prediction models based on the Pheromone trap catches; (2) Bio insecticides such Agreeen (contains *Bacillus thuringiensis aegypti*) and Spinosad; (3) Insect Growth Regulators (Consult: Anti molting compound produced by Dow Agroscience; Cascade: Anti molting compound produced by American Cyanamid; Mimic Molting accelerating compound produced by Rhorm and Haas; (4) Plant growth regulators and Defoliant (Pex: Cotton leaf defoliant and Cytokin: Growth promoting and fruiting hormone compound produced by Rhorm and Haas); (5) Augmentation of *Trichogramma* sp. Various combinations of the tested components were formulated and applied in commercial cotton fields in two successive seasons. Percent of infestations, cotton yield and population density of both natural enemies and sucking pests were used as criteria for evaluation of the various measures. Results showed that: Agreeen, Trichogramma, Cascade, Consult, Mimic, Spinosad and convention insecticides gave reduction in infestation of the three tested pests by 34-75%, 22.1%, 37.7- 75.3%, 33.9- 71.4%, 38.8-74.5%, 67-77.1% and 63.4%, respectively.

IPM 2

INTEGRATED PEST MANAGEMENT PROGRAM FOR CONTROLLING *CAPNODIS CARBONARIA* KLUG AND *C. TENEBRIONIS* L. (COLEOPTERA: BUPRESTIDAE) IN IRBID GOVERNATE. Naim Sharaf and Lara Jaber, Plant Protection Department, Faculty of Agriculture, Jordan University, Jordan, Email: n.sharaf@ju.edu.jo

Three field experiments were conducted at Alaal (Irbid, Jordan) during the period of November 2003 to July 2004, to evaluate the different control measures against *Capnodis carbonaria* Klug and *C. tenebrionis* L. on stone-fruits and to establish an integrated pest management (IPM) program. Results based on yield analysis and percent kill calculation indicated that Confidor ranked first, followed by Mesurool and then Gusathion. The three pesticides increased yield by 67.38, 63.29 and 57.93%, respectively. Economic threshold (ET) for these beetle pests was calculated and revealed that control actions should be initiated at infestation level of one insect per tree. Efficacy of cultural and mechanical control measures was also examined. Results drawn by yield analysis and percent decrease in infestation calculation showed that fertilization ranked first and caused a significant increase in yield by 67.44% on the average. Pruning and adult hand-collection ranked second and third by causing 64.93% and 63.97% increase in yield on the average, respectively. In view of the above-mentioned results, the integration of the previously examined control measures in an IPM program against the devastating attack of *C. carbonaria* and *C. tenebrionis* to stone-fruits was carried out in a third field experiment. Findings will be discussed and possible management tactics will be presented.

IPM 3

FAO INPUTS IN THE PEACH FRUIT FLY (*BACTROCERA ZONATA*) MANAGEMENT IN THE NMIDDLE EAST AND NORTH AFRICA REGIONS. Khaled Alrouechdi, FAO-Sub regional Office for North Africa (SNEA), B.P. 300, Cité Mahrajène 1082 Le Belvédèr, Tunis, Tunisia, Email: Khaled.Alrouechdi@fao.org

The Peach Fruit Fly (PFF) (*Bactrocera zonata*) is considered as the most dangerous pest attacking many fruits, such as mango, guava, peach, apricot, plum, pear, papaya, citrus, figs, and date, in addition to secondary vegetable hosts such as cucurbits, tomato and others. When not treated, the PFF can affect all the

yield. In the Near East region, the pest is, at present, mainly located in Egypt, Yemen, Iran, Saudi Arabia, Oman, UAE and also in Ghaza District. Should this pest spread to PFF-free countries around the Mediterranean Basin and get established, the economic impact on the domestic and export market fruit production could be in the order of US\$ millions per year as a consequence of increased direct damage, insecticide use, quarantine restrictions, cost of certification programs (including post harvest treatments), and environmental impact costs. The FAO regional project on PFF management, aimed successfully to face this serious pest and to prevent its spread. This project helped also to identify the pest in many countries and to support the national programs concerning the control of the pest and prevent its disastrous spread to other areas. The FAO is looking for a new phase for this project with field training (on both national and regional levels), providing international expertise and necessary equipment necessary for the detection, monitoring & control of the pest as well as phytosanitary measures and information exchange. The present paper reviews the current status of PFF and its management in the Middle East & North Africa regions.

IPM 4

THE COMPLEMENTARITY BETWEEN THE USE OF REGARD AND PREDATORS *COCCINELL SEPTEMPUNCTATA* IN *APHIS FABAE* CONTROL. Nizar Mustafa Al-Mallah and Juhina Edris Mohamed Ali, Plant Protection Department, Faculty of Agriculture and Forest, Mousel University, Iraq, Email: e_madk@maktoob.com

The complementarity between different concentrations of tregard (0.5, 3, 1.5%) and the method of application (by treating the leaf only; leaf and aphid; leaf, aphid, adult male and female of lady birds) were evaluated in terms of their killing rate and predacious efficiency. Tregard killing rate of aphids increased with increased concentration and reached 84.2% at a concentration of 0.55%, 24 hours after treatment, and male predators were more sensitive to tregard females> Predacious efficiency reached 53.1 and 52.6% for females and males, respectively, following tregard leaf spray. However, killing rate reached 47.1 and 39.1% for males and females, respectively, five days after treatment of leaves, aphids and adult males and females of ladybirds.

IPM 5

THE TRADITIONAL METHODS OF INTEGRATED PEST MANAGEMENT ARE A PROMISING STRATEGY TO REDUCE POPULATION DENSITY OF COFFEE BERRY MOTH *PROPHANTIS SMARAGDINA* (BUTLER) IN THE FIELD. Hassan Soliman Mahdi¹, Amin Al Hakimi², Mohamed Mahyoub³, Ahmed Sayef³, Saeed Al Sharjabi⁴, Fredric Pola⁵. (1) Plant Protection Department, Faculty of Agriculture, Sana'a University, P. O. Box 14430 Sana'a, Republic of Yemen, Email hsamahdi@yahoo.com; (2) Yemeni Genetic Resources center, Faculty of Agriculture, Sana'a University; (3) General Department of Plant Protection, Ministry of Agriculture and Irrigation (MAI); (4) Classification and Industrialization, Coffee Department, MAI; (5) French Embassy/ Technical Cooperation (French Food Aid Counterpart Funds).

Coffee, one of the 5 national strategic crops for export in Yemen, suffers from many problems leading to low yields and quality. Among these, the coffee berry moth (*Prophantis smaragdina* (Butler)) (Pyralidae: Lepidoptera), is by far the most important pest of coffee in the country and can cause losses up to 50% of the total production in some seasons. Among the traditional methods used to control this pest were the application of branches of Athab tree (*Ficus salicifolius*) inside coffee tree, smoking by burning cow manure at night during full moon and removing newly infested parts of trees attacked by the insect and burning them. The study was conducted during two seasons in most commonly growing coffee regions in the country; Medinat Ash-Sharq, Dhamar governorate and Wadi Yahar, Lahj province. During 2004 season, the results indicated that Athab branches followed by smoking treatments reduced the population density of coffee berry moth in comparison to the control. Results also showed that the Athab branches treatment was the most effective in reducing the rate of fruits infestation (3.29% and 6% for Medinat Ash-Sharq, and Wadi Yahar, respectively) in comparison to the other treatments either smoking treatment (4.64% and 13% for the two region, respectively) or sanitation treatment (4.79% and 12.21% for the two region, respectively). During 2005 season, the results showed that all traditional methods decreased the population density of coffee berry moth in comparison to the control. However the population density of coffee berry moth in the combined treatment (Athab + smoking + sanitation) continued to be low until the end of the season in

comparison to the control. Results have also showed that the combined treatment (Athab + smoking + sanitation) was the most effective in reducing the rate of fruits infestation (4.71% and 5.79% for Medinat Ash-Sharq and Wadi Yahar, respectively) in comparison to the other treatments, smoking and sanitation (8.79% and 12.79% for the two region, respectively) or the use of Athab and sanitation (5.14% and 12.64% for the two region, respectively). The population density of coffee berry moth was higher during 2004 and 2005 seasons in Wadi Yahar than that at Medinat Ash-Sharq. During this study one local parasitoid, *Elasmus* sp. (Eulophidae: Hymenoptera) was recorded on coffee berry moth larva in Medinat Ash- Sharq during June, 2005 with parasitism rate of 11.11%.

IPM 6

NEW APPROACHES FOR BOLLWORMS CONTROL. Abd El-Aziz Abou El-Ela Khidr, Plant Protection Research Institute, ARC, Dokki, Giza 12618, Egypt, Email: prof.abdelaziz.abouelela@gmail.com

Cotton is the most important crop in Egypt as well as in other countries in the world. Pink bollworm; *Pectinophora gossypiella* (Saund.) and spiny bollworm; *Earias insulana* (Boisd.) are considered the main pests infesting cotton plants. These pests attack the fruit parts of the cotton plants such as buds, flowers and green bolls. This investigation is intended to control bollworms by using sex attractant pheromones with the following objectives in mind: protection of the ecosystem from insecticidal pollution, reducing the insecticides dosages, delaying the emergence of resistance in the pest to the insecticide and to keep the natural enemies which represent the most important factor in the integrated pest management to maintain their role in controlling many pests. The methods of pheromone application used included: 1) pheromone baited traps for the timing of the application (besides the green boll inspection). This procedure was effective in reducing the infestation rates caused by bollworms from 7% to be less than 2%; 2) Mass trapping was effective in reducing the infestation levels with bollworms due to the disturbance in the sex ratio. This method could be utilized at low infestation rates rather than at high infestation levels; 3) Attractant and kill technique was implemented to attract the male moths by the pheromone in order to be killed by the insecticide substance in the mixture of pheromone and insecticide. This method reduced significantly the rates of infestation as well as insecticides used in comparison to using insecticides alone for bollworms control.

IPM 7

EFFECT OF SOME ELEMENTS OF INTEGRATED PEST MANAGEMENT ON THE CONTROL OF PINK BOLLWORM. Abd El-Aziz Abou El-Ela Khidr¹, I.H. El-Namaky¹, A.I.Gadallah² and S.M. El-Awady². (1) Plant Protection Research Institute, ARC, Dokki, Giza, 12618 Egypt; (2) Faculty of Agriculture, Al-Azhar University, Cairo, Egypt, Email: prof.abdelaziz.abouelela@gmail.com

Pink bollworm, *Pectinophora gossypiella* (Sound.) is the most important pest infesting cotton plants and causing considerable loss of cotton yield in Egypt. The extensive use of insecticides for the pest control had created several problems, such as polluting the environment, development of resistance and disturbance of normal balance between the pests and their natural enemies. The objective of this study was to evaluate some elements of integrated pest management for pink bollworm control. Insects control by the mating disruption technique is achieved by the wide spread application of synthetic pheromone formulation over the crop. The insects are then unable to locate their mates when using their own pheromone and mating activity is therefore reduced. The aim of this work was to protect green bolls from the pest damage. Results revealed that when the application of pheromone is integrated with insecticidal treatments had a highly significant reduction on the green bolls infestation with pink bollworm as compared with using insecticides alone, where the reduction in infestation was around 37%. It was noticed that the predators number in the pheromone treated area was two fold of that in the insecticides treated area. The enzymes activity in the larvae collected from the insecticides treated area was much higher than that in the pheromone treated area because of selection for resistance in the pest due to the extensive use of insecticides. Infestation rates caused by the pest and the insecticides used were higher in the late planting as compared with early planting.

IPM 8

INTEGRATION OF INHERITED STERILITY AND MASS TRAPPING TECHNIQUES FOR THE CONTROL OF THE CAROB MOTH *ECTOMYELOIS CERATONIAE* IN A POMEGRANATE ORCHARD. Jouda Mediouni, Laboratoire de Protection des Végétaux, Institut National de la Recherche Agronomique de Tunisie, 49 Rue Hedi Karray, 2049 Ariana, Tunis, Tunisia, Email: joudamediouni@lycos.com

The Carob moth *Ectomyelois ceratoniae* Zeller (Lepidoptera: Pyralidae) is a polyphagous insect that causes serious damage on several host-plants both in storage and in the field in Tunisia and in the Mediterranean basin and Near East regions. Results showed the compatibility of these control methods and their potential to reduce the natural insect population. At harvest, the assessment of fruit damage in treated field showed a very low infestation compared to the control. Indeed, after 3 years of entire season releases and mass trapping, an incidence of 1.25% of fruit infestation was obtained against 25% in the control orchard.

IPM 9

INTEGRATION OF THE INSECT GROWTH REGULATOR NOMOLT AND TWO PREDATORS (*METASYRPHUS COROLLA* F. AND *COCCINELLA UNDECIMPUNCTATA* L.) FOR CONTROLLING *APHIS FABAE* SCOP. Sahil K. Al-Jameel and Guhiana I. Mohamud Ali, Plant Protection Department, College of Agriculture and Forestry, Mosul University, Iraq, Email nadeemramadan@yahoo.com

Studies were conducted to evaluate the predacious efficiency of two predators, *Metasyrphs corollae* F. (Syrphidae: Diptera) and *Coccinella undecimpunctata* L. (Coccinellidae: Coleoptera), and their integration with IGR Nomolt to control *Aphis fabae* Scop. (Aphididae: Homoptera). Results indicated that both larval predators had great feeding ability on nymphs and adults of *A. fabae*; they consumed an average of 137.53, 116.26 and 166.6, 195.15 nymphs and adults of *M. corolla* and *C. undecimpunctata* respectively. The results indicated that Nomolt (0.5 cm/l) gave highest mortality of *A. fabae* (88.3 %) at 40 nymphs/plant. The combined effect of IGR and two densities of predators also showed significant effect when prey density, IGR and predators density were used. Rate of prey death reached 100% when Nomolt and two predators (one and two larvae) and a prey density of 20 and 40 nymphs/plant were used. However, with the prey density 40 nymphs/plant and using IGR and one larva of *M. corolla*, the death rate reached 77.7%.

IPM 10

DEVELOPEMENT AND IMPROVEMENT OF IPM ON NAVEL AND MAROC LATE CITRUS VARIETIES IN SIDI SLIMANE AREA, NORTH-WEST OF MOROCCO. C. Smaili¹, M. Afellah¹, T. Bihi², J. Wadjinny³, M. Sebaghi¹ and M. Zemzami². (1) Entomology Laboratory, INRA Kenitra, BP 239, Morocco, Email: csmaili@yahoo.fr; (2) Domaines Agricoles, UCP Sale Morocco; (3) Regional Plant Protection Inspection, BP 148, Kenitra Morocco.

The development and improvement of IPM on two citrus varieties Navel and Maroc Late, was carried out in Sidi Slimane area, at the north western part of Morocco during the period 2002-2005. A new vision of integrated pest management was practiced and improved on a large scale with pilot citrus producers. Many techniques were carried out and several thousands of parasitoids *Aphytis melinus* were released against the red California scale. The results showed that the species including *Aonidiella aurantii*, *Parlatoria pergandii*, *Lepidosaphes beckii*, *P. ziziphi*, *Ceratitidis capitata* and snails were the major pests of this area. During this period, none of the treatments were applied against aphids, whiteflies, leafminer and mites. On the other hand, none or very little bait spraying method was executed for medfly on Maroc Late and Navel varieties. The impact of all used techniques in the context of IPM was discussed. During harvest, the fruit infestation rates were economically tolerable < 2% for medfly and < 1% or almost null for the scale insects). An adequate and methodic diagram of IPM was elaborated in order to control these principal citrus pests for this area. This new IPM strategy can be used also against Medfly in combination with the sterile insect technique.

IPM 11

INTEGRATED MANAGEMENT OF DATE PALM DISEASES IN THE ARAB GULF COUNTRIES. Emad Hussain Al-Turaihi, Ministry of Municipal Affairs and Agriculture, Agricultural Development Department, P.O. Box 1966, Doha, Qatar, Email: al_turaihi@yahoo.com

Date palm (*Phoenix dactylifera* L.) is considered to be one of the most important fruit trees in all of the Arab Gulf countries. It is also planted as an ornamental tree in public gardens and alongside the roads. All parts of the tree may be subject to attack by fungal diseases such as: terminal bud rot (*Thielaviopsis paradoxa*), black scorch (*T. paradoxa*), false smut (*Graphiola phoenicis*), leaf base rot (*Diplodia phoenicum*), leaf spots (*Alternaria* spp., *Cladosporium* spp., *Helminthosporium* spp. and others) and inflorescence rot (*Mauginiella scaettae*). This study showed that the movement of diseases had been facilitated by increased travel and trade exchange of agricultural products between and within Arab Gulf countries, in addition to suitable climatic and agricultural conditions. Integrated crop management (ICM) is a cropping strategy in which the farmer seeks to conserve and enhance the environment while economically producing safe, wholesome food. Its long term aim is to optimize the needs of consumers, society, the environment and the farmer. The study also revealed that the components of integrated crop management (ICM) such as quarantine legislation -the first line of defense-, biological control, resistant cultivars, tissue culture, plant extracts, crop husbandry and hygiene, bunch cover, avoiding of inter-cropping culture, and agricultural practices -irrigation, fertilization, harvest and storage- offered an environment friendly alternative to harmful chemical fungicides. However, integrated crop management options need to be developed where they could be used in integrated crop management/production programme.

IPM 12

INTEGRATED CONTROL OF *RHIZOCTONIA SOLANI* ON TOMATO. Mohamad S. Hassan¹, D.Q. Al-Obaidy² and A.K. Abdulhadi². (1) Plant Protection Department, College of Agriculture, University of Baghdad, Iraq; (2) Al-Musayab Technology College, Iraq, Email: Mohamad2004S@yahoo.com.

A study conducted in Almusayab Tech. College to integrate chemical and biological control of *Rhizoctonia solani*. Results showed the Benlate and Beltanol fungicides were strong inhibitors to radial growth of *R. solani* and *Trichoderma harzianum* (100%) at rates of 0.5, 1.0 and 1.5 g/l under laboratory conditions. Growth of *R. solani* and *Trichoderma harzianum* was reduced by 62.8% and 36.9% by the application of Techazol, respectively. Soil treatment with Techazol and *T. harzianum* gave the lowest rate of pre-emergence damping off (10.0%), post emergence damping off (2.90%) and infection severity (5.69%). Whereas root and shoot weights were increased (0.71 and 3.70 g/plant, respectively). No significant differences were recorded between values of this treatment and values of treatment of tomato seeds by Techazol and soil treatment with *T. harzianum*, meanwhile these differences were significant compared to control treatments.

IPM 13

USE OF ORGANIC MANURES IN CONTROLLING *FUSARIUM SOLANI*. Mohamad S. Hassan¹, A.K. Abdulhadi² and D.Q. Al-Obaidy². (1) Plant Protection Department, College of Agriculture, University of Baghdad, Iraq; (2) Al-Musayab Tech. College, Iraq, Email: Mohamad2004S@yahoo.com

Triticum harzianum isolated from horses manure revealed 1.75 antagonism degree according to Bell's scale. Reduction rate of pre-and post-emergence damping off caused by *Fusarium solani* was achieved by applying a combination of isolated fungi from sewage waste and manure of cow, sheep, horses and poultry, and were 30.13, 25.13, 26.35, 23.43, 24.30% and 32.00, 25.58, 27.45, 25.83, 26.13%, respectively. The infection severity of these treatments were 43.16, 33.52, 81.20, 32.40 and 32.50%, respectively, as compared to a pre- and post-emergence damping off in control treatment of 54.8 and 56.9%, respectively.

IPM 14

INTEGRATED CONTROL OF SESAME ROOT ROT DISEASE IN NINEVAH PROVINCE. Ali Kareem Al-Taae¹, N.B.S. Al-Lashi¹ and M.B. Ismael². (1) Plant Protection Department, College of Agriculture and Forestry, Mosul, Iraq, Email aaltaae@yahoo.co.uk; (2) Biology Department, College of Science University of Mosul, Iraq.

The effect of the pelleting of sesame seeds with chemical and biocontrol elements on the incidence and disease severity of sesame root rot was evaluated. Dual treatments resulted in a significant decrease of root rot incidence and severity in comparison with the individual treatments. The treatment of sesame transplants with xanthan significantly decreased root-rot incidence and severity, compared to the treatment with Arabic gum. Treating transplants with Beltanol and *Trichoderma harzianum* reduced root rot incidence and severity to 16.66% and 0.10, respectively compared to xanthan treatment. The effect of pelleting the seeds with chemical and biocontrol elements on root rot incidence and severity and different bean growth features three and four months after planting in the field. Pelleting the seeds with Beltanol and *T. harzianum* by using xanthan gave the least incidence and root-rot severity following both periods.

IPM 15

USING DIFFERENT APPROACHES TO CONTROL CUCUMBER ROOT ROT DISEASE CAUSED BY *PHYTOPHORA DRECHSLERI* TUCKER. Yaser A. Bani and Saleh H. Samir, Plant protection Department, College of Agriculture, Baghdad, Iraq, Email: Salehsamir2004@yahoo.com

The aim of this study was to evaluate different approaches to control the cucumber root disease caused by *Phytophthora drechsleri* which was isolated from cucumber infected root. Results indicated that all treatments achieved significant reduction in disease severity of *P. drechsleri* compared with the control treatment. Seed treatment with *Pseudomonas fluorescens* (4×10^8 c.f.u./ml) and two additions of bacterial inoculum with irrigation achieved lowest disease severity of 6.9%, followed by copper nutrient and biocontrol agent *Trichoderma harzianum* with Ridomil treatments which were added to infested soil with pathogen. These two treatments reduced disease severity to 9.7 and 12.9%, respectively, and all three treatments significantly increased dry weight of shoots, roots and plant length. Soil application with copper was more efficient in reducing disease severity (9.7%) compared with spraying (13.9%). Ridomil, Beltanol, and Tachigazol were effective in controlling *P. drechsleri*. Beltanol was the most effective in reducing of disease severity to 23.6%.

IPM 16

EVALUATION OF AN INTEGRATED CONTROL SYSTEM AND GRAFTING IN CONTROLLING FUSARIUM WILT AND ROOT-KNOT NEMATODE OF CUCURBITS IN JORDAN. M. Al-Qasim¹, Z. Musallam², Z. Nasser¹ and D. Mustafa¹. (1) National Center for Agricultural Research and Technology Transfer, P.O. Box 639, Baq'a 19381, Jordan, Email: mohdqasim@ncartt.com; (2) Quaranteen Laboratories, Department of plant protection, Ministry of Agriculture, Jordan.

Two separate tests were carried out to evaluate the efficacy of an integrated control system in controlling root-knot nematode and *Fusarium* wilt on cucumber at Jarash (north Jordan) and watermelon in Quirrh (south Jordan). The integrated control system included bio-fumigation of soil with fresh cow manure at 7 and 10 kg/m² for 21 days, then amending soil with either bio-control fungi (*Trichoderma* and *Paecilomyces*), chemical fertilizers, or no additives as control. A third test was carried out in Quirrah to evaluate the effect of grafting watermelon cv. Rasul-Abd on the rootstock "Tetsu Kuboto" (resistant to *Fusarium*) in controlling *Fusarium* wilt on watermelon. Results showed that bio-fumigation plus bio-control fungi were the most effective and reduced ($P \leq 0.05$) number of *Fusarium* propagules in cucumber soil by 42 – 60.5%, compared to the control. These treatments also reduced ($P \leq 0.05$) numbers of *Meloidogyne*-second stage juveniles in soil and root-knot indices at the end of the season. However, bio-fumigation plus chemical fertilizers have also reduced ($P \leq 0.05$) the wilt incidence of watermelon by *Fusarium* and also the numbers of *Fusarium* propagules in watermelon soil by 44.3 – 47.6%, compared to the control. Grafting was very effective and reduced wilting of watermelon by 64.7%, leading to an increase in watermelon yield by 60%, compared to the control.

IPM 17

THE USE OF TRANSPLANTING AS A METHOD FOR CONTROL ROOT-ROT OF SESAME WITH OTHER CONTROL METHODS UNDER GREENHOUSE CONDITIONS. Najwa B. Alasee, Biology Department, College of Sciences, Mosul University, Iraq, Email: najwab_2005@yahoo.com

This experiment was performed to determine the efficiency of using transplanting as a method to control root-rot disease of sesame seeds (local cultivar) were planted in plastic boxes filled with sterilized mixture of soil and peatmoss (2:1). Healthy one month seedlings were chosen for planting in pots, and the soil was contaminated with a mixture of the fungi: *Macrophomina phaseolina*, *Fusarium solani*, *Pythium aphanidermatum* at the rate of dish/fungus/pot. Each replicate included 50 treatments. Roots of transplants were treated before planting with the different biocontrol agents or fungicides. *Trichoderma harzianum*, two *Trichoderma viride* isolates, and bacterial biocontrol agents, such as *Pseudomonas fluorescens* and *Bacillus subtilis* were applied as conidial or spore suspensions. Also Techiazol, Beltanol and celest were used as fungicidal suspensions at the rate of 3 ml/l. The transplants were also treated with a mixture of each fungicide with every species of the biocontrol agents. Infection rate and severity of the disease, average length of shoots and roots, average leaf area, number of pods and branches, and dry weight of the plant were measured, 3 months after treatment. Results obtained will be presented.

IPM 18

THE USE SOLARIZATION IN WEEDS AND NEMATODE MANAGEMENT. Ezarug A. Edongali and Tunis M. Mohamed, College of Agriculture, El-Fatih University, Tripoli, Libya, Email: Edongali48@hotmail.com

A study was conducted to evaluate the efficacy of transparent and black plastic covers in soil solarization for the management of root-knot population (*Meloidogyne javanica*) and weeds, and their subsequent effect on growth and productivity of tomato (*Lycopersicon esculentum*) and eggplants (*Solanum melongenum*). Results indicated that the efficiency of both treatments were almost identical on the reduction of nematode population in the first year of trial, while the black cover was more efficient in the second season. Reduction of nematode population reached 66.8-88.0% for transparent cover and 81.5-100% for black cover. Root gall indices were significantly lower in both treatment compared with the untreated control. Growth of both crops were not significantly different from each other, but were significantly higher than the untreated plants. All weeds were not able to grow except Bermuda grass (*Cynodm dactylon*), which was more tolerant to solarization. Results also showed that soil temperature was 20°C higher under cover compared with the uncovered control.

IPM 19

EFFECTS OF SOLAR HEATING IN POLYETHYLENE MULCHED OR UN-MULCHED SOIL OF FUSARIUM WILT AND RHIZOCTONIA ROOT ROT INCIDENCE OF CUCUMBER PLANTS UNDER GREENHOUSE CONDITIONS. Eman S. Farrag¹ and Y.O. Fotouh². (1) Plant Pathology Department, Faculty of Agriculture, Quina, South Valley University, Egypt; (2) Plant Pathology Department, National Research Centre, Giza, Egypt, Email: eman_farrag@yahoo.com

Effect of solar heating in mulched or un-mulched soil on Fusarium wilt or Rhizoctonia root rot diseases under greenhouse conditions were studied. Isolation and pathogenicity test indicated that the most severe fungus was *Fusarium oxysporium* f.sp. *cucumerinum* (isolate No. 2), which caused wilt disease incidence of 26.4 and 67.7% at the pre- and post-emergence stages of cucumber, respectively. Meanwhile, the root rot fungus, *R. solani* (isolate No.2) caused 41.0 and 71.0% at pre- and post-emergence growth stages of cucumber, respectively. Nylon net bags containing artificially infested soil with *oxysporium* f.sp. *cucumerinum* or *R. solani* inocula were buried 10 -20 cm below soil surface in either mulched or un-mulched soil for 4, 6, or 8 weeks to evaluate mulching effects on reduction of fungal population density and diseases incidence. Results indicated that the reduction of fungal population increased as the period of soil mulching was prolonged. The highest reduction in *F. oxysporium* f.sp. *cucumerinum* and *R. solani* population (99%) was obtained in soil mulched for 8 weeks and decreased gradually to reach its minimum (55%) after 4 weeks of soil mulching. Fungal population reduction in un-mulching soil followed the same trend. Cucumber plants were transplanted in pots containing previously buried soil under mulching or un-mulching conditions. Effect of soil solarization on cucumber wilt or root rot incidence was evaluated under

greenhouse conditions. The highest reduction in Fusarium wilt or Rhizoctonia root rot was obtained in soil mulched for 8 weeks. Although mulched soil reduced the wilt or root rot diseases after 6 and 8 weeks, there was no significant reduction after 4 weeks. The results obtained indicated that the fungus remained active for 4 weeks in un-mulched soil. It could be suggested that soil solarization for 8 weeks proved highly effective to reduce cucumber wilt and root rot incidence and could be considered as practical treatment for controlling these soil borne plant pathogens.

IPM 20

RECENT TRENDS IN THE MANAGEMENT OF WHEAT DISEASES IN GLOBAL LEVEL. Salah Eddin Khabbaz, D. Ladhakshmi and V. Valluvaridasan, Department of Plant Pathology, Centre for Plant Protection Studies, Tamil nadu Agricultural University (TNAU), Coimbatore-3, India, Email: salah_edk@yahoo.co.uk, salahthalal@rediffmail.com

Wheat is the world's most widely cultivated food crop. It contains more proteins than other cereals and relatively high content of niacin and thiamine. It is one of the most important staple food crops and suffers from several diseases. The major diseases of wheat are rust, head blight, powdery mildew, smut, and bunt. Many diseases of wheat cause significant reduction in yield and quality if not properly managed. Eighty four per cent yield loss of wheat due to rust attack is reported from Australia. Eighty five per cent of the worldwide fungicide is used on wheat (US \$ 1.589 billion). Hence IDM (Integrated Disease Management) should be adopted. In Canada, powdery mildew is managed by the application of silicon which induces cell defense mechanism against the disease. ICARDA (International Centre for Agricultural Research in the Dry Areas) is working on the screening of germplasm against rust diseases. Many developed and developing countries identified sources of resistance genes viz., *Lr 21*, *Lr 35*, *Lr 46* and *Sr 39* against the most important rust diseases. Management of take all disease by the application of biocontrol agents viz., *Pseudomonas fluorescens*, *P. aureofaciens* has been reported. Genetically engineered wheat plants with mammalian anti-viral gene showed resistance against wheat stripe mosaic virus. Tools are developed in Germany, to detect fungal spore and weather factors for precise diagnosis which help in advanced planning of disease management. As a whole, management of the disease should apply all the available methods that are ecofriendly and economic to get a sustainable yield.

IPM 21

INTEGRATED MANAGEMENT OF PRODUCTION AND PEST CONTROL OF GREENHOUSE CROPS. Khalifa, H. Dabaj¹, Mustafa H. Blak², Ayiad I. Al-Haji² and Emhammed M. Essoul². (1) Department of Plant Protection, Faculty of Agriculture, Al-Fateh University, Tripoli, Libya, E-mail: dabajhk@yahoo.com; (2) Agriculture Research Centre, Tripoli, Libya.

An integrated management program for production and pest control of greenhouse crops was applied during the last three growing seasons 2003/2004, 2004/2005 and 2005/2006 in the western region of Libya. The management program included: Soil solarization, installing insect-proof nets, planting on plastic soil mulches, pruning and training of plants, placement of sticky insect traps, sanitation, use of bumble bee as pollinators, and good quality transplants. Results indicated that application of this program led to effective control of soil-inhabiting and air-borne pathogens and pests. The main advantages of this program are reduced need for multiple applications of pesticides and less consumption of irrigation water. In addition, there was an increase in production and improvement in quality. Ultimately, it is hoped that this approach will lead to less build-up of resistance in pests and less contamination of the environment.

Biological Control

BC 1

CONTROL OF CUTWORMS IN HORTICULTURE OF SWISS CHARD BY USING ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA* BALS. Abdul Hamid Hafez, Department of Plant Protection, Faculty of Agriculture, University of Aleppo, Syria, Email: hafez2224@hotmail.com

An experiment was carried out to control cutworms *Agrotis* spp. (Lepidoptera: Noctuidae), that feed on the leaves of Swiss Chard (*Beta vulgaris* L. ssp. *cicla* f. *hortensis* Alef). The entomopathogenic fungus *Beauveria bassiana*, was used in this study, in Aleppo, Syria, during 2004. The results showed that the fungus activity started to become visible 11 days after the treatment; and continued till harvest. The mortality rate observed for this treatment was 80% in comparison with the control.

BC 2

FIELD EVALUATION OF TWO SPECIES OF ENTOMOPATHOGENIC FUNGI (*BEAUVERIA BASSIANA* AND *VERTICILLIUM LECANII*) AGAINST JASMINE WHITFLY, *ALEUROCLAVA JASMINI* ON CITRUS. Hussain F. Alrubeai, Samera A. Khlawi, Jawad B. Hammoud and Mohammed W. Khadir, Ministry of Science and Technology, IPC Research Center, P.O. Box 765, Baghdad, Iraq, Email: halrubeai@yahoo.com

Pathogenicities of two species of entomopathogenic fungi, *Beauveria bassiana* and *Verticillium lecanii* against jasmine whitefly on citrus, *Aleuroclava jasmine* were measured and compared under field conditions at three different locations. The results of citrus tree treatments indicated that parasitization rate of *B. bassiana* (isolate 5) on eggs and nymphs were significantly higher than that of *V. lecanii* with some differences between locations. The parasitization rate of eggs was, in general, significantly lower than that of nymphs. It was also found that parasitization of both fungal species tested, increased significantly with time. The results suggested the probability of a negative effect of temperature increase and decrease in relative humidity in the field on the parasitization rate.

BC 3

ISOLATION, IDENTIFICATION AND MANIPULATION OF ALMOND BORER PHEROMONES (*CAPNODIS CARBONARIA* KLUG). Manar Bani Mfarrej and Naim Sharaf, Plant Protection Department, Faculty of Agriculture, Jordan University, Jordan, Email: n.sharaf@ju.edu.jo

Laboratory and field experiments were carried out during the period from 2003 to 2005 to isolate and identify the pheromones of almond borer (*Capnodis carbonaria* Klug) (Buprestidae: Coleoptera), test the attraction of Almond Borer to the isolated pheromone components and explore the potential of the isolated pheromone components to manipulate almond borer in stone fruit orchards. Chemical analysis for samples taken in April, revealed that three aliphatic hydrocarbon pheromones were detected by using Gas Chromatography Mass Spectrometry (GC-MS). These pheromones were: hexacosane (C₂₆H₅₄), n-heptacosane (C₂₇H₅₆) and nonacosane (C₂₉H₆₀). Both females and males of almond borer responded to the opposite sex pheromone at an active zone ranging from 208.5 to 230.6 cm. Pheromone fractions were isolated by using silica gel chromatography. Laboratory and field experiments carried out using three fraction concentrations revealed that FB1 fraction was more effective in trapping almond borer adults than MB1 fraction and the later was more effective than MG1 fraction. Also, the concentration of one unit of pheromone fraction / one unit of solvent was the most effective. Isolation, identification, and efficacy of pheromones to manipulate almond borer adults were discussed. To our knowledge, this is the first record on *Capnodis* pheromones.

BC 4

MYCOPATHOGENS OF THE CORN LEAF APHID, *RHOPALOSIPHUM MAIDIS* (FITCH.) INFESTING WHEAT PLANTS IN ASSIUT, EGYPT. A.Y. Abdel-Mallek¹, M.A.A. Abdel-Rahman², S.A. Omar¹ and G.H.A. Hamam¹ (1) Assiut University, Botany Department, Assiut, Egypt, Email: yehyamalek2@yahoo.com; (2) Plant Protection Research Institute, ARC, Egypt.

The present study was carried out during 2000 and 2001 wheat growing seasons. Mycopathogens of the corn leaf aphid, *R. maidis* were investigated under natural conditions. Seven species belonging to four genera of entomopathogenic fungi infecting this aphid species were identified. The fungal species were *Beauveria bassiana*, *B. alba*, *Conidiobolus coronatus*, *C. obscurus*, *C. thromboides*, *Panadora (Erina)*

neoaphids and *Zoophthora radicans*. The species *B. bassiana*, *B. alba* and *Z. radicans* were the predominant followed by *P. neoaphids* and *C. obscurus*. The species *C. coronatus* and *C. throboides* were the least frequent. Species of the genus *Beauvaria* were observed from the beginning of February up to the middle of March. Maximum mortality by this genus was observed during February 15. *Conidiobolus* spp. were observed three weeks after *Beauvaria*. These species fluctuated from February 22 to March 15. Whereas, *Z. radicans* was observed from February 15 up to March 15. Maximum mortality caused by these fungi was observed during March 8. *P. neoaphidis* was observed from the third week of February to the third week of March, with maximum mortality on March 15.

BC 5

NATURAL INCIDENCE OF ENTOMOPATHOGENIC FUNGI ISOLATED FROM SOIL IN ASSIUT, EGYPT. S.S. Mohamed El-Maraghy¹, M. A. A. Abdel-Rahman², A. Y. Abdel-Malek¹ and K. A. Hussein. (1) Botany Department, Faculty of Science, Assiut University, Egypt; (2) Plant Protection Research Institute, Agricultural Research Center, Egypt, Email: selmaraghy2@yahoo.com

The present investigation was carried out to elucidate the natural incidence of entomopathogenic fungi identified and isolated from soils cultivated with wheat and cotton plants in Assiut, Upper Egypt. Baiting technique using greater wax moth, *Galleria mellonella* L. were used. Two species of entomopathogenic fungi, were isolated and identified from soil. These species were *Beauveria bassiana* (Bals.) and *Metarhizium anisopliae* (Metch.). From 2068 alive larvae of greater wax moth only 105 larvae (90 isolates from *B. bassiana* represented 85.71% and 15 isolates from *M. anisopliae* represented 14.29%) were infected with entomopathogenic fungi and caused 5.08% mortality. The results indicated that *B. bassiana* seemed to be the most important biological control agent fungus. However, *M. anisopliae* could be of economic importance, if the environmental conditions changed in their favour. These fungal species, were observed all year round in relatively low occurrence but the maximum was detected during April and October months due to the optimum conditions prevailed. The effect of some meteorological factors on the incidence of the above mentioned fungi was also evaluated.

BC 6

MYCOPATHOGENS OF THE CORN LEAF APHID, RHOPALOSIPHUM MAIDIS (FITCH.) INFESTING WHEAT PLANTS IN ASSIUT, EGYPT. A.Y. Abdel-Mallek¹ and M.A.A. Abdel-Rahman², S. A. Omar¹ and G. H. A. Hamam¹. (1) Assiut University, Botany Department, Assiut, Egypt; (2) Plant Protection Research Institute, ARC, Egypt, Email: yehyamalek2@yahoo.com

The present study was carried out during 2000 and 2001 wheat growing seasons. Mycopathogens of the corn leaf aphid, *R. maidis* were investigated under natural conditions. The following seven species belonging to four genera of entomopathogenic fungi were identified infecting this aphid species: *Beauveria bassiana*, *B. alba*, *Conidiobolus coronatus*, *C. obscurus*, *C. throboides*, *Panadora (Erina) neoaphids* and *Zoophthora radicans*. These genera were *Conidiobolus*, *Panadora*, *Zoophthoru* and *Beauvaria*. The species *Beauvaria bassiana*, *B. alba* and *Zoophthora radicans* were predominant followed by *Panadora* and *Conidiobolus obscurus*. The species *C. coronatus* and *C. throboides* were the least present. *Beauvaria* spp. were observed from the beginning of February up to mid March. Maximum mortality by these species was observed during February 15. *Conidiobolus* spp. were observed three weeks after *Beauvaria*. These species fluctuated from February 22 to March 15. *Zoophthora radicans* was observed from February 15 up to March 15. Maximum mortality occurred by this fungus was observed during March 8. *Pandora (= rina) neoaphidis* was observed from the third week of February to the third week of March with a peak of mortality on March 15.

BC 7

BIOLOGICAL EFFECT OF SOME BACILLUS SPECIES ON THE TROGODERMA GRANARIUM EVERTS BEETLE. Sarab D. Alshamaa and Khaleda A. Sulyaman, Department of Biology, College of Science, Mosul University, Mousel, Iraq, Email: dr_srabalshamaa@yahoo.com

The aim of this paper was to evaluate the effectiveness of 8 bacillus strains mixed with wheat grains to control the khapra beetle *Trogoderma granarium* Everts. The 8 bacillus strains used belong to 5 species (3 strains of *Bacillus thuringiensis*, 2 of *B. mycoides* and the rest were *B. badius*, *B. polymyxa*, and *B.*

macerans). Cellular extract of these strains were used in two concentration, 1×10^3 and 1×10^6 cell/ml, which were then compared with commercial insecticide which is locally used in Mosul (Manco zeb) at concentration 1 kg/ton. Results revealed high death rate and an elevated morphological abnormality of larvae in the 3rd instar when exposed to grains treated with the above bacillus extracts. The highest death rate was caused by *B. thuringiensis* and *B. macerans* at a rate of 90% after 96 h compared with 70% death caused by commercial insecticide. On the other hand, the toxicity of these bacterial extracts was tested against infant mice directly by oral administration. No dangerous effect was noticed except little enlargement of stomach in treated infants mice.

BC 8

SURVEY AND POPULATION DYNAMICS OF SOME PESTS INFESTING *ALLIUM AMPELOPRASUM*, *ANETHUM GRAVEOLENS* AND *PETRORELINUM CRISPUM* AND THEIR BIOLOGICAL CONTROL BY *BEAUVERIA BASSIANA*. M.H.A. Soliman, Plant Protection Research Institute, ARC, Dokki, Egypt.

Allium ampeloprasum, *Anethum graveolens* and *Petrorelinum crispum* were infested with *Aphis gossypii*, *Liomyza trifolli*, *Tetrnacus telarius* and *Thrips tabaci*, with highest infestation by *T. tabaci*. *A. gossypii* recorded highest numbers on 7 and 14 March during 2005 and 2006 seasons. *L. trifolli* recorded the highest population on 7 March 2005. *T. telarius* recorded a peak on 21 March, 2005 and 7 April, 2006 on *A. ampeloprasum*, but *T. tabaci* recorded high infestation on all three plant species. The use of *Beauveria bassiana* led to a gradual increase in the rate of reduction, 3-10 days after the treatment. Data indicated that, biofly liquid solution was a superior formulation against *T. tabaci* on *A. graveolens*, whereas Biover W.P. was the most effective on *T. tabaci* and *T. telarius* on *A. ampeloprasum*.

BC 9

COMPARATIVE EFFICACIES OF DAY AND NIGHT APPLICATIONS OF *BACILLUS THURINGIENSIS* TO CONTROL COTTON LEAFWORM *SPODOPTERA LITTORALIS* BOISD. UNDER HOT WEATHER CONDITIONS. Sadek Abdel-Wahed Salem, Plant Protection Department, National Research Centre, Dokki, Cairo, Egypt, Email: sadeksalem2002@yahoo.com

A series of field experiments were carried out to evaluate the possible effect of timing and spraying method of *Bacillus thuringiensis* formulation on control efficacy of cotton leaf worm, *Spodoptera littoralis* in both cotton and corn fields. The formulation of *Bacillus thuringiensis* was applied by ground motor or knapsack sprayer using one formulation (*B.t.* var. *galleriae* HD-234) and two applications on the crops. The application rate, 750 g/600 l or 200 l of water (motor or knapsack). The results have shown that most spray was deposited on leaves when ground motor was used. The highest larval mortality and best dispersal of viable *B.t.* spores in plant canopies was also obtained with the use of motor sprayer. The statistical analysis showed that the data obtained on sprayed plots and untreated plots were significantly different. In case of cotton cultivation, the night application (June) gave superior results as compared to daytime application. Thus, it gave higher larval mortality rate, significantly decreased egg masses hatchability and gave higher crop yield of corn plants. Night spray offered few more advantages than day time spray due to small differences between day and night temperatures during this period. Survival of spores applied at night was better than those applied during the day.

BC 10

EFFECT OF SOME PHYSIYO-CHEMICAL AND NUTRITIONAL FACTORS ON THE MYCELIUM GROWTH AND SPORULATION OF ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA*. Bahia Doumandji-Mitiche¹ and Fatima Zohra Bissaad². (1) Department of Agricol and Forestry Zoology, National Agronomic Institute, El-Harrach, Algiers, Algeria; (2) Department of Biologie, Faculty of Science, University of Boumerdès, B.P. 35000 Boumerdes, Algeria, Email: bissaad@yahoo.com

In this study, a local isolate of *Beauveria bassiana* isolated in April 2003 from an *Apidae* species found at Reghaia, a suburb of Algiers. To determine the characteristics of this isolate, various culture media were tested: Potato's Dextrose Agar (PDA), malt, Mueller-hinton, Oxatetracycline gelose agar, OGA, GN and Sabouraud. Effect of other factors such as temperature (10-40°C), pH (3-9) and water activity (a_w 0.75-

0.99) on mycelium growth and sporulation of a local isolate of *B. bassiana* were evaluated. Results indicated that the medium PDA was the best medium for growth (4.73 cm) and sporulation (13×10^6 spores), and the optimum temperature for mycelium development and sporulation was 25°C. The pH which led to the maximum mycelium growth and sporulation was between 5 and 6.

BC 11

EFFICIENCY OF THE ENTOMOPATHOGENIC FUNGI *BEAUVERIA BASSIANA* AND *VERTICILLIUM LECANII* FOR BIOLOGICAL CONTROL OF WHITEFLY, *BEMISIA TABACI*.

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A study was conducted under field conditions to evaluate the efficiency of two entomopathogenic fungi *Beauveria bassiana* and *Verticillium lecanii* to parasitize whitefly immature instars. Results revealed that *V. lecanii* showed the highest rate of parasitism (73.4%) on adults and nymphs on eggplant under field conditions at Al-Nehrawn compared with *B. bassiana* isolate 1 and 2 (56.7 and 50.4%, respectively) 10-days after treatment. When conidial suspension of *V. lecanii* was used with 0.02% triton, it caused the highest parasitism rate (90%) 10 days after treatment. In a field experiment at Al-Tuwaitha, the results indicated that *V. lecanii* showed the highest rate of parasitism (90 and 80.66%) compared with *B. bassiana* isolate 1 and 2 (68.66, 60 and 53.33, 48%), when used with 0.02% triton and 0.2% corn oil, respectively, 10 days after treatment. Whereas in a green house experiment, the results showed the use of *V. lecanii* and *B. bassiana* isolate 1 together was more effective in parasitizing (90%) than the use of either one alone (70.3 and 81% for *V. lecanii* and *B. bassiana* isolate 1, respectively) on adults and nymphs 15 days after treatment. There was a clear reduction in the number of colony forming units (CFU) viability of *V. lecanii* and *B. bassiana* isolate 1 and 2 with time of storage. The fungal viability when stored at room temperature was less efficient than storage at 4 °C.

BC 12

BIOINSECTICIDE ACTIVITY ON *CULEX PIPIENS* LARVAE BY SOME STRAINS OF *BACILLUS PHAERICUS* AND *B. THURINGIENSIS* SPECIES.

Basima A. Abdulla and Esraa K. Al-Samak, Department of Biology, College of Science, Mosul University, Mousel, Iraq, Email: basimaaa138@yahoo.com, anmaraltaee1978@yahoo.com

The study included the isolation, identification and the ability of *B. sphaericus* and *B. thuringiensis* species to kill *Culex* larvae. These isolates were obtained from different air and soil environment in Nineveh Governorate. Using Nutrient Yeast Salts Medium Glucose (NYSMG) enhanced the growth of most of the bacterial spores. Isolation of *B. sphaericus* species resistant to Streptomycin was carried out using the Selective Media Nutrient Yeast Salts Medium Streptomycin (NYSMS). Comparing the two media, we concluded that the NYSMS reduced the number of bacterial spores growth by 85-90% for most of the samples. The ability of isolates to kill *Culex pipiens* larvae was investigated. One isolate from the two species and control species *B. thuringiensis* could 100% kill *Culex* larvae during the first day of incubation at room temperature ($30 \pm 2^\circ\text{C}$), and one *B. thuringiensis* isolate could also 100% kill following the second day, and three isolates from the two species could 100% kill following the fifth day. Nine isolates from of *B. sphaericus* and eight isolates from *B. thuringiensis* were found to kill the larvae following the fifth day of incubation.

BC 13

CONTROL OF STORED CEREAL GRAIN INSECT *RHYZOPERTHA DOMINICA* (F.).

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This study was conducted during the growing season 2003/2004 to determine, the frequency of insects which attach grains under storage conditions, in the semi arid area of Sétif, east of Algeria. The most frequent species observed was *Rhyzopertha dominica* (F.) (Coleoptera: Bostrychidae). During the crop year 2004/2005 infestation rate in the area of Sétif was found to be around 15.02%. The evaluation of three durum wheat varieties to attack by *R. dominica*, during three months of storage, at $30 \pm 2^\circ\text{C}$ and $70 \pm 5\%$ H.R.

suggested that the varieties Waha and Kebir were susceptible, and the variety Jabato was the most resistant. The use of entomopathogens as a control method was not used for the protection of stored cereals. Nevertheless, *Pseudomonas syringae* was a very promising alternative against *R. dominica* (F.) and gave 100% protection for 48 hours when using, the dose of 4.10^7 cell/ml at -10°C . Protection reached 20, 30 and 50% when individuals were exposed at 30, 10 and 0°C , respectively. The death rate was 40% for the individuals exposed to doses of 2.10^5 and 2.10^6 cell/ml at -10°C for 48 hours.

BC 14

PATHOGENICITY OF ENTOMOPATHOGENIC FUNGUS *BEAUVERIA BASSIANA* AGAINST SWEETPOTATO WHITEFLY *BEMISIA TABACI* ON DIFFERENT HOST PLANTS. Aref H. Olleka^{1,2} and Sun-xiang Ren¹ (1) Laboratory of Biological Control, South China Agricultural University, Guangzhou, 510642 China, Email: aolleka@yahoo.com; (2) The General Commission of Scientific Agricultural Research, Damascus, Syria.

Sweet potato whitefly, *Bemisia tabaci*, has become a serious widespread insect pest of greenhouse and field crops. Biological control provides an environmentally and potentially stable management to combat pests. The entomopathogenic fungus *Beauveria bassiana* has high activity against whitefly. The host plant effect on the susceptibility of whitefly to the entomopathogenic fungi was determined. Insects were reared on four vegetable species (cucumber, eggplant, tomato and cabbage), and experiments were conducted in cages under controlled conditions of temperature $26\pm 1^{\circ}\text{C}$ and relative humidity $65\pm 5\%$ RH to favor infection. Second-instar nymphs were sprayed with 1×10^7 conidia/ml fungal suspension and control treatment was sprayed with 0.02% aqueous Tween 80. Nymphs showed varied response to infection by fungi after one-time application of conidia. On cucumber plants, whiteflies were very susceptible, whereas, insects reared on tomato plants were significantly less susceptible to infection. Average mortality in the control treatment was 0%. Pathogenicity of entomopathogenic fungi differed depending on the host plant. Ten days after inoculation, the LC_{50} values ranged from 5.21×10^4 on cucumber to 3.23×10^6 on cabbage. The LT_{50} values for this isolate using 1×10^7 conidia/ml concentration ranged from 5.76 days on cucumber to 8.06 days on cabbage. Cucumber showed minimum influence on susceptibility of nymphs to entomopathogenic fungi. Results indicated that *B. bassiana* has potential ability to control whitefly.

BC 15

ISOLATION OF FUNGAL AND BACTERIAL ANTAGONISTIC MICROORGANISMS TO *FUSARIUM OXYSPORUM* F.SP *ALBEDINIS* CAUSAL AGENT OF BAYOUD OF THE DATE PALM AND TO OTHER FUNGI. Moulay Hassan Sedra, Arab Organization for Agricultural Development (AOAD), Director of Researches, Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech INRA, Marrakech, Morocco, Email: mhsedra@yahoo.fr, sedramh@menara.ma, sedramh@hotmail.com

The bayoud, *Fusarium* wilt of date palm, is generally considered one of the most dangerous and menacing disease of the date palm groves in the Arabian world especially in North Africa. Several famous commercial varieties and clones of very high fruit quality were extinct and others can disappear because of their susceptibility towards the bayoud disease. In order to preserve and to exploit this precious and/or rare genetic material to avoid possible attack of the disease, the use of the resistant soils and the application of microbiological control agents seems to be possible. This study permitted to isolate many antagonistic microorganisms to the causal agent of the bayoud, varied in their origin of isolation (soil, roots...) and in their species. These antagonists appeared capable to inhibit the germination of the pathogen spores, its development in the soil and its pathogenic ability of date palm, in comparison with other non antagonistic microorganisms and the inhibitory activity of some fungicides. It was demonstrated that the antagonists secrete some substances capable to decrease significantly the pathogen development in water and in soil in comparison with tested substances extracted from non antagonistic microorganisms and fungicides. In addition, some substrate formulations were selected for their ability to store these microorganisms. In the same way, the methods of preparation and use of these substrates were developed. In order to appreciate the effect of the antagonists on other diseases, the results showed that some antagonists were able to inhibit the pathogens growth causing: 1) some diseases of date palm as inflorescences rot, black scorch on leaves and dates rot, 2) *Fusarium* wilt of tomato, melon, asparagus, oil palm, pea and linen. It appears that the isolation

of these antagonistic microorganisms as well as the anti-fungal substances that they secrete opens new avenues for date palm protection against the bayoud disease.

BC 16

THE EFFECT OF SOME BIOINSECTICIDES AGAINST *BRUCHUS RUFIMANUS*. M.M. Sabbour and Shadia Abd-El-Aziz, Pests and Plant Protection Department, National Research Center, Dokki, Cairo, Egypt, Email: sabbourm9@yahoo.com

Stored products are important source of protein in Egypt but the infestation with the insect pests causes a loss in the protein content. *Bruchus rufimanus*, is a major pest on beans in the field and store, it could be controlled by biological methods in the field and store. This study was carried out to investigate of this insect pest can controlled in the store by five types of oils (benzaldhede, onion oil, mustard oil, clove oil and nigella oil). The rate of infestation was significantly decreased to $50.6 \pm 5.8\%$ after treatment with 0.5% of onion oil under laboratory conditions. The same results were obtained in the store and in the field. The use of 7 kinds of bags (selofane, plastic packing, wax paper, aluminum foil, carton packing, muslin and fiber sacs) in the store treated with the different oils showed that the nigella oil followed with onion oil, can significantly decreased the insect pets number inside the bags. The rate of infestation decreased to 20, 21, and 25% 20 days after treatment of the bean plant with nigella oil, benzaldhede and onion oil, respectively.

BC 17

BIOLOGICAL ACTIVITY OF SOME *PHTHORIMAEA OPERCULELLA* ZELL. (LEPIDOPTERA: GELECHIIDAE) GRANULOSIS VIRUS (BACULOVIRIDAE) LOCAL ISOLATES TO CONTROL THE POTATO TUBER MOTH IN TUNISIA. Mohamed Maher Ben Letaifa¹, A. Laarif¹, S. Fattouch³ and M. Habib Ben Hammouda^{1,2}. (1) Ecole Supérieure d'Horticulture et d'Élevage de Chott Mariem, P.O. Box 47, Chott Mariem, 4022, Tunisia, Email: mohamed.maher.beltaifa@gmail.com; (2) Institut National de Recherche Agronomique de Tunis, Route 7050, 2080, Ariana, Tunis; (3) Institut Nationale des Sciences appliquées et Technologiques, Ariana, Tunis.

Ten isolates of the *Phthorimaea operculella* Granulosis virus was collected from several main production regions in Tunisia based on symptomological criteria and immunological tests conducted earlier. Local isolates were evaluated for their ability to control the potato tuber moth pest. Newly hatched larvae were reared on potato tubers infected with granulovirus isolates using several concentrations. Larvae fed on tubers sprayed with a high dose of Baculovirus solutions (isolates 5 to 10) showed a larval mortality rate three times higher than the control. Nymph mortality by using the same concentration of viral solutions (5 larval Equivalent) showed a little difference compared to the control. However, isolates number 1,6,7 and 8 caused pupal mortality rate which ranged between 164% and 270% compared to the control.

BC 18

BACULOVIRUSES AS PEST CONTROL AGENTS: EXPERIENCES FROM THE PAST AND FUTURE OUTLOOK. Philip Kessler and Martin Andermatt, Andermatt BIOCONTROL AG, Stahlermatten 6, 6146 Grossdietwil, Switzerland, Email: kessler@biocontrol.ch

Baculoviruses are insect pathogenic viruses that are ideal and valuable agents for biological pest control. They are very selective, do not produce toxins or residues, and are generally regarded as safe. Since 20 years, products based on baculoviruses have been registered and commercialised in Europe. To this date, the area, where baculovirus products are applied, has increased up to 2-3 million hectares worldwide, because these products are not only used in organic farming systems, but have also proven to be a suitable alternative in integrated production. The *Cydia pomonella* granulovirus (CpGV), for example, is being applied worldwide not only in organic but also in IP orchards for the control of the codling moth, *Cydia pomonella*. Apart from its high efficacy, CpGV has also been recognized as an excellent tool for resistance management, particularly now that resistance towards chemical pesticides is increasing. The development of resistance towards CpGV, as it has recently been reported to occur after intensive sprayings over numerous years, can be broken by the use of new mixtures of CpGV genotypes. CpGV is a good example of how baculoviruses can be used as an effective and sustainable control tool against insect pests. Recently, new baculoviruses against such pests as *Cryptophlebia leucotreta*, *Helicoverpa armigera*, *Spodoptera littoralis* or *Spodoptera exigua* have been commercialized.

BC 19

HISTOPATHOLOGICAL EFFECT OF *BACILLUS THURINGIENSIS* (BERLINER) FORMULATIONS AGAINST THE SPINY AND PINK BOLLWORMS.

Salim Mohamed Taher Khoja¹, George Nasralla Rezk², Madiha Aboul Makarem Rizk² and Hamdy El-Said Mohamed Hanafy². (1) Department of Plant Protection, Agricultural Scientific Research Center of Aleppo, P.O. Box 4195, Almidan, Aleppo, Syria; (2) Department of Plant Protection, Faculty of Agriculture, Ain Shams University, Shoubra El-Kheima, Cairo, Egypt.

Laboratory experiments were carried out to investigate the effect of two *B. thuringiensis* formulations (Dipel 2x and Protecto) on the larvae mid gut of spiny and pink bollworms. The newly hatched larvae of the two insect species were fed on artificial diet containing 1 g/lit of *B. thuringiensis* formulations for two days then were transferred to untreated diet for eight days. When the larvae were paralyzed, they were prepared for histological examination. The results revealed that the treated larvae showed several changes as compared with the control ones. The distraction of the mid gut of infected larvae, showed complete separation of epithelial cells from the basement membrane, some destruction of the epithelial cells and peritrophic membrane and degradation and necrosis of most epithelial cells and some parts of the longitudinal circular muscle.

BC 20

THE USE OF ENTOMOPATHOGENIC FUNGI: A PROMISING IPM APPROACH FOR SUNN PEST MANAGEMENT. B. L. Parker¹, M. Skinner¹, M. El Bouhssini², B. Reid¹, D. Moore³, S. Edgington³ and Z. Sayyadi¹. (1) Entomology Research Laboratory, University of Vermont, Burlington, Vermont, USA 05405-3400; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: M.Bohssini@cgiar.org; (3) CABI Bioscience, UK.

Sunn pest (*Eurygaster integriceps*, Puton) is a very destructive insect pest of wheat in West and Central Asia. In collaboration with its partner national agricultural research systems in West and Central Asia, along with the University of Vermont, USA and CABI Bioscience, UK, ICARDA has been developing IPM options for the management of Sunn pest where the use of insect-killing fungi constitute the backbone of the control strategy. Some 250 fungal isolates have been collected from Sunn pest overwintering sites in West and Central Asia and seven isolates of *Beauveria bassiana* were collected from new generation adults in wheat fields in Turkey and Syria. This represents the largest collection of Sunn pest entomopathogenic fungi worldwide. The most prevalent species isolated was *B. bassiana*. This can be produced on cereal grain and applied cheaply in cooperation with farmers. Based on laboratory and greenhouse bioassays and preliminary fieldwork, several isolates have shown great potential for use as biocontrol agents in overwintering sites (granular based formulation) and in the field (oil formulation). The most likely use strategy of the oil formulation would be aimed at border applications of fields to infect the overwintering adults as they enter the wheat fields in spring. Initial results demonstrate >80% mortality among several isolates using field rates comparable to industrial formulations. Additional work investigating different formulation strategies for both overwintering site and wheat field applications demonstrates the potential to mass-produce these fungi, with a final product that will be inexpensive and simple to apply. Promising fungal isolates with appropriate formulations will be recommended for Sunn pest management, along with other IPM options.

BC 21

ROLE OF ENTOMOPATHOGENIC NEMATODES IN THE REGULATION OF INSECT POPULATION. **Mohammed Musalem Hubias**, P.O. Box 2773, Salalah 211, Sultanate of Oman, Email: hugir1966@yahoo.com

The fauna of entomopathogenic nematodes in the Sultanate of Oman were investigated. Ten nematode isolates members of Heterorhabditiae and Steinernematidae, parasitizing insects were identified. Their biology, development and pathogenic ability to various insect stages were investigated. Under the Sultanate of Oman natural conditions, a high level of spread in the soil was observed (27.9 - 46.4%) in March - April and September - October. Biological effectiveness of entomopathogenic nematodes was around 60%. The profitability of their use was 80% higher than that of chemical pesticides. The opportunity

of combined application of nematodes preparations and chemical pesticides for the protection of plants against insect pests will be presented.

BC 22

INVESTIGATIONS ON THE EFFICACY OF ENTOMOPATHOGENIC NEMATODES AGAINST *SPODOPTERA LITTORALIS* (BIOSD.) AND *GALLERIA MELLONELLA* (L.). A.S. Abdel-Razek¹ and M.M. Abd-Elgawad². (1) Department of Pests and Plant Protection; (2) Department of Plant Pathology, National Research Centre, El-Tahrir Street, Dokki 12622, Cairo, Egypt, Email: abdelrazek820@yahoo.com

The infectivity of seven entomopathogenic nematode strains of the families Steinernematidae and Heterorhabditidae were tested against the last instar larvae of the cotton leaf worm, *Spodoptera littoralis* (Biosd.) and the greater wax moth, *Galleria mellonella* (L.) in Petri dish and sand column assay. Exposure of the insect species to a dose of 100 IJ/ml of *Heterorhabditis* sp. strain ELG., *H. indica*, *Heterorhabditis* sp. strain ELB. gave a 100% mortality of *S. littoralis* larvae in Petri dish 24 h after exposure. The rest of the strains tested gave mortalities ranged between 50–90% after 24 h, and reached 100% after 48 h exposure. In the sand column assay strains, *Heterorhabditis* sp. ELB., *S.riobravae* and *S. carpocapsae* were the most active against *S. littoralis* with 100% mortality, 24 h after exposure. The results of infectivity against *G. mellonella* showed that *H. indica* was the highest in the Petri dish assay and *H. egyptii* was the highest in sand column assay with 100% mortality after 24 h. of exposure. The penetration rate as an indicator of entomopathogenic nematode infection was also evaluated. The highest activity was recorded for *Heterorhabditis* sp. ELB. (62.3%) and *S. carpocapsae* (61.4%) against *S. littoralis* in both the Petri dish and sand column assay. In case of *G. mellonella*, the highest penetration activity was recorded for *Heterorhabditis* sp. ELG. (68.3 %) and *S. riobravae* (65.00 %) in both the Petri dish and sand column assays..

BC 23

BIOLOGICAL CONTROL OF THE PEACH FRUIT FLY (*BACTROCERA ZONATA*) SUNDERS BY USING ENTOMOPATHOGENIC NEMATODE, *STEINERNEMA FELTIAE* CROSS N 33. F.M. Mahmoud and M.A.M. Osman, Plant Protection Department, Faculty of Agriculture, Suez Canal University, Ismailia, Egypt, Email: mfmfmousa@hotmail.com, naeim70@hotmail.com

Laboratory experiments were performed to determine the efficiency of the entomopathogenic nematode *Steinernema feltiae* cross N 33 against second and third instar larvae, 2, 4, 6 day old pupae of the peach fruit fly *Bactrocera zonata*. Experiments were carried out in Petri dishes lined with moist filter paper. Mortality of 3rd instar larvae 72 h after exposure ranged from 32-88%, 8-56% for 2nd instar larvae, 4%-56% for 1 day old pupae, 0-32% for 4 day old pupae and 0-20% for 6 days old pupae. Slope, LC₂₀, LC₅₀ and LC₉₀ were estimated. Slope values ranged from 1.25-1.44 for 2nd and 3rd instar larvae and 1.6, 1.1 and 0.97 for 1, 4 and 6 days old pupae. Results demonstrated that 3rd instar larvae and 1 day old pupae of *B. zonata* were significantly more susceptible to nematode infection than 2nd instar larvae and 4, 6 days old pupae at all concentrations of 50, 100, 200, 400 and 800 infective juveniles.

BC 24

PARASITISM OF THE WHEAT STEM SAWFLY (HYMENOPTERA: CEPHIDAE) IN NORTHERN SYRIA. Mohamed Izzat Ghannoum¹, Naief Al-Salti² and Jom'a Ibrahim². (1) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: I.Ghannoum@cgiar.org; (2) Plant Protection Department, Faculty of Agriculture, University of Aleppo, Aleppo, Syria.

Wheat stem sawfly (WSS) is one of the main insect pests that affect both barley and wheat in northern Syria. Larvae feed on the contents of the host stem, resulting in empty or small-seed spikes. The larvae move down in the stem where it hibernates, which results in lodging of stems and a loss in yield. The presence of natural enemies can be an important IPM component to control this insect. A survey was conducted in some fields to assess the level of infestation and the most common parasite species on this pest. Of the parasitoid species that attack WSS in the field, only *Collyria coxator* Villers (Hymenoptera: Ichneumonidae), and *Bracon terebella* Wesmal (Hymenoptera: Braconidae), were found in large and effective numbers. The level of parasitism varied according to the location, year, and from one site to another within the same field.

BC 25

MANIPULATION OF THE SEVEN SPOTTED LADY BEETLE, *COCCINELLA SEPTEMPUNCTATA* FOR AUGMENTATIVE RELEASE FOR CONTROLLING THE WOOLLY APPLE APHID, *ERIOSOMA LANIGERUM* (HAUSMANN). Ashraf A. H. Mangoud, Plant Protection Institute, ARC, Dokki, Giza, 12618 Egypt. E-mail: ashrafhendy2001@yahoo.com

The woolly apple aphid, *Eriosoma lanigerum* (Hausmann) (Homoptera: Aphididae) is a monophagous species and a bark feeder, infesting both the stems and roots of apple trees. The seven-spotted ladybird, *Coccinella septempunctata* L. (Coleoptera: Coccinellidae) is an important predator of aphids and play a good role in reducing the population density of *E. lanigerum*. *C. septempunctata* were released (one time), in early April 2004 and repeated in 2005, at Qualubia Governorate at a rate of 30, 60 and 90 eggs/tree. During the first season (2004), the reduction rate of *E. lanigerum* in increased gradually with elapse of time reaching the maximum in early November. The achieved reduction in aphid population was 72.3, 87.3 and 95.5% in November following the release of the three levels of *C. septempunctata*, respectively. Similarly, reduction of *E. lanigerum* was achieved in the second season (2005), with 77.1, 90.1 and 96.0% reduction following the release rate of 30, 60 and 90 eggs *C. septempunctata* per tree, respectively. From the above mentioned results, it can be concluded that the seven-spotted ladybird, *Coccinella septempunctata* L. could be used successfully, as an active component in the integrated program for controlling the woolly apple aphid, *Eriosoma lanigerum* (Hausmann) on apple trees, to minimize the hazards of insecticides use on public health and the environment.

BC 26

THE INFLUENCE OF CORN STEM BORER EGG PATCH SIZE ON PARASITISM EFFICIENCY OF *TELENOMUS BUSSEOLAE* GAHAN. Jasim K. Mohammed and Abdul-Sattar A. Ali, State Board for Agricultural Research, P.O. Box 39094, Abu-Ghraib, Bagdad, Iraq, Email: Jasim_Aljanabi1968@yahoo.com

The egg parasitoid *Telenomus busseolae* Gahan. (Hymenoptera: Scelionidae) is found in most corn growing areas under natural conditions. The egg masses attacked are generally concealed under leaf sheath or other narrow spaces and vary greatly in size. The present studies were conducted to investigate the influence of plant growing stage on the distribution of different sizes of corn stem borer egg masses and their relation to parasitism efficiency of *Telenomus busseolae* Gahan. Results indicated that masses containing 25 eggs were the most common in the field. These sizes showed higher parasitism rate compared to other sizes. However, number of egg masses and rate of parasitism were influenced by growth stage of host plant and environmental conditions. Parasitism rate was low in the early growing stage during August and increased gradually to reach more than 90% during September. The possibility of conserving and using this parasitoid in the control management of corn stem borer in Iraq was discussed.

BC 27

ECOLOGY AND PREDATION EFFICACY OF LOCAL PREDATOR *CLITOSTETHUS ARCUTUS* ROSSI TO CONTROL JASMINE WHITEFLY *ALEUROCLAVA JASMINI* (TAKAHASHI) ON CITRUS IN IRAQ. N.N. Hama, A.S. Abdel-Razak, A.A. Afy, L.A. Mohamd and N.S. Abed, IPM National Center, State Board for Agricultural Research, Ministry of Agriculture, Abu-Ghriab, Baghdad, Iraq, Email: nazar_sbar@yahoo.com

As a part of an integrated pest management program for *Aleuroclava jasmini* (Aleyrodidae: Homoptera) on citrus, mass rearing of the Coccinellid *C. arcutus* was carried out under semi-field controlled conditions. Three inoculation doses were released in four orchards located in Dyala and Wassit governorates at an average of 8 adults/tree during 2005-2006 season. *A. jasmini* average infection were reduced from 31 to 14.81 eggs/ leaf and from 4.67 to 10.98 nymph /leaf for the Dyala first location; from 20.60 to 3.11 egg/leaf and from 2.7 to 3.95 nymph /leaf for the second location four months after release. In Wassit, predator efficiency was higher by reducing infection from 23.64 to 6.06 egg/leaf, and from 78.01 to 3.54 nymph/leaf for the first location and from 26.02 to 16.26 egg/leaf and from 48.19 to 16.00 nymph /leaf for the second location, during the same period. Predator density increase coincided with time progress and inoculation process. Furthermore, field data indicated a fluctuation in the predator density correlated with

the host and prevailing climatic conditions. Two peaks (spring – Autumn) were recorded for the *C. arcutus* on *A. jasmini* with average densities of 2.16 and 2.6 adult/leaf at minimum and maximum temperature of 8°C and 23°C, respectively and R.H. of 44%. Predator densities on *T. ricini* were from 1.16-4.83 adult/leaf for the spring peak and from 1.75-23.5 adults/leaf for the Autumn peak. This clearly suggests that *C. arcutus* prefer *T. ricini* as a main host over *A. jasmini*.

BC 28

BIOLOGICAL CONTROL, POPULATION DYNAMICS AND CONTROL STRATEGIES OF THE FODDER CORN SPIDER MITE (*TETRANYCHUS URTICAE KOCH*) IN MOROCCO. Samir Fakhour, Regional Center of Agricultural Research, P.O. Box 567, Beni-Mellal, Morocco, Email: sfakhour@caramail.com

Colonization of the field by *T. urticae* takes place at the 4 leaf stage (receptive stage) coming mainly from weed species surrounding corn fields. Taking into account the surrounding climatic conditions, the spider mite developed easily several generations leading to a peak of 100 % of infested plants during the 12 leaf phenological stage. The follow-up of the two populations during the tests of biological control indicated a complex prey-predatory relation between *T. urticae* and *P. persimilis*. Indeed, in spite of the unfavourable climatic conditions for the proper development of the predator, *P. persimilis* showed high potential in the biological control of the mite pest populations. The experimental work undertaken on three varieties of fodder corn showed that Chemical control alone did not minimize qualitative and quantitative losses on the two varieties for the middle term cycle (V2 and V3), except the variety of short term cycle (V1). Integrated chemical and biological control had given satisfactory results on all varieties. The best control was obtained by using 5 *P. persimilis* for 10 *T. urticae* coupled with chemical intervention based on selected non-harmful products. The predacious mite *P. persimilis* proved to have good capacity to control *T. urticae*.

BC 29

SUSCEPTIBILITY OF CERTAIN TOBACCO VARIETIES TO DISEASE COMPLEXES OF ROOT-KNOT NEMATODES *MELOIDOGYNE JAVANICA* AND SOIL FUNGI *FUSARIUM SOLANI* AND *MACROPHOMINA PHASEOLINA*, AND THEIR BIOLOGICAL AND CHEMICAL CONTROL. B.G. Antoon, Z.A. Stephan and M.H. Al-Jboory, Plant Protection Research Centre, State Board for Agricultural Research, Abu-Ghraib, Baghdad, Iraq, Email: basimanematod@yahoo.com

The present study was conducted to evaluate the effect of the nematode-disease complexes of the root-knot nematode *Meloidogyne javanica* and two soil fungi *Fusarium solani* and *Macrophomina phaseolina* on four tobacco varieties: Baghdad, Sumer, Rabeea and Sharqi Mahalli, to control this disease complex biologically and chemically under shade-house conditions in Abu-Ghraib, Baghdad. Results indicated that the effect of nematode-disease complex treatments were more significant on all growth parameters of the four tobacco varieties than all other treatments, including the control. In all varieties, the combined effect of nematode and *Fusarium* was more severe than nematode and *Macrophomina*. Other results indicated that Furfural, bio-agent fungi *Trichoderma harzianum*, *Paecilomyces lilacinus*, tobacco dust and carbofuran successfully controlled the disease complex with significant differences when they were applied 2 weeks before planting than those inoculated or untreated (control) plants. Furfural was the most effective in inhibiting the two fungal pathogens, which ranged between 96.7-100% with 88-100% inhibition of the nematode, while carbofuran was the least effective product with an inhibition level of 0-3.3 and 58-82%, against the fungi and nematode, respectively.

BC 30

STUDY OF EFFICIENCY OF SOME *TRICHODERMA* ISOLATES ON BIOLOGICAL CONTROL OF FUSARIUM WILT OF CHICKPEA CAUSED BY *FUSARIUM OXYSPORUM* FSP *CICERIS* WITH CULTURAL AND MOLECULAR CHARACTERIZATION OF THESE ISOLATES. Houda Bouregghda, Zouaoui Bouznad and Salim Benkraouch, Laboratoire de mycologie, Département de botanique, Institut National Agronomique (INA), EL Harrach, Alger, Algeria, Email: houdabouregghda@yahoo.fr

Fusarium wilt caused by *Fusarium oxysporum* f.sp. *ciceris*, is the most important soil-borne disease of chickpea throughout the world. The most practical and cost-effective method for management of Fusarium wilt of chickpea is the use of resistant cultivars, the effectiveness of which is limited by the

occurrence of different pathotypes and races of *F. oxysporum* f.sp. *ciceris*. In this study we have evaluated and compared the antagonistic effect of some isolates of three species of *Trichoderma* (*T. longibrachiatum*, *T. harzianum* and *T. atroviride*) *in vitro* and in the green house. Results obtained showed the existence of considerable difference in the capacity of *Trichoderma* isolates to decrease the growth and conidia production of the *F. oxysporum* f.sp. *ciceris* *in vitro* and on the decrease of disease severity. This difference was noticed between isolates of different species (interspecific) and between isolates of the same species (intraspecific). The cultural and molecular characterization by RAPD of *Trichoderma* isolates showed a clear difference between isolates of the three species and between isolates of the same species which may explain the difference of antagonistic capacity between isolates of the same species.

BC 31

MECHANISMS OF BION INDUCED RESISTANCE RESPONSE OF TOMATO TO *PHYTOPHTHORA INFESTANS*. M.M.M. Atia¹, A.Z. Aly¹, H. Buchenauer² and M.I. Abou-Zaid¹. (1) Agriculture Botanic and Plant Pathology Department, Faculty of Agriculture, Zagazig University, Zagazig, Egypt, Email: usamaatia2@yahoo.com; (2) Institute of Phytomedicine (360), Hohenheim University, 70599 Stuttgart, Germany.

Treated tomato with different concentrations of "bion®" induced local and systemic resistance against challenged inoculation with *P. infestans* on detached and intact leaves. The duration of resistance (time course) induced by bion as a single spray application on tomato remained effective for 14 days as a local and systemic against late blight. Bion, slightly reduced mycelial growth, but didn't inhibit zoospores release and cysts germination of *P. infestans*. Peroxidase activity was increased in bion treated and upper untreated tomato leaves tissues as compared to the checks, and the highest activity was reached 36 and 48 h after treatment. In bion treated tomato leaves, superoxide anion (O₂⁻) generation was determined 12-36 h after treatment by nitroblue-tetrazolium staining, and production of H₂O₂ was detected by 3,3-diaminbenzidine-4 HCl staining 12-16 h after treatment. Also, free and total salicylic acid (SA) contents significantly increased in chitosan treated leaves. Furthermore bion enhanced accumulation of pathogenesis related-proteins (PR-proteins) such as β-1,3-glucanase, chitinase and PR14 in treated and upper untreated tomato leaves, which are known as defense-related (DR)-proteins. From this study, bion (BTH) didn't inhibit fungal mycelial growth, zoospores release and cysts germination of *P. infestans*. It activates the accumulation of several defense-related mechanisms i.e. increase in peroxidase activity, generation of reactive oxygen species (ROS) such like O₂ and H₂O₂, the accumulation of defense-related (DR)-proteins such as chitinase, β-1,3-glucanase and PR-14 protein and increased in free and total SA content.

BC 32

BIOLOGICAL CONTROL OF *MELOIDOGYNE JAVANICA* AND *ROTYLENCHULUS RENIFORMIS* BY *TRICHODERMA* SPP. Amin Wafdy Amin¹ and Fardos Bochari². (1) Department of Zoology & Nematology, Faculty of Agriculture, Cairo University, Egypt, Email: Amin_Amin280@yahoo.com; (2) Biology Department, Faculty of Sciences, King Saud University, Saudi Arabia.

The efficacy of *Trichoderma* species in the control of reniform nematode (*Rotylenchulus reniformis*) and root-Knot nematode (*Meloidogyne javanica*) were studied in Vitro and under greenhouse conditions. The effect of *Trichoderma harzianum*, *T. viride*, *T. koningii*, *T. reesei* and *T. hamatum* culture filtrates in controlling both nematodes was studied in Vitro in 14 cm Petri-dishes after one week exposure and under greenhouse conditions on one month old eggplant cv black beauty seedlings in 12 cm plastic pots containing 1 Kg sandy-loam (1:1, V/V) soil at 30±5 °C. All culture filtrates of *Trichoderma* species were highly significant in controlling both nematode species on eggplant. *T. harzianum*, *T. hamatum* and *T. koningii* culture filtrates gave significant reduction (p≤0.01) in Vitro and decreased the female and egg-masses of reniform and root-knot nematodes. *Trichoderma* species inhibited the nematode activity and movements of the nematode juveniles in Vitro after one week exposure. *Trichoderma* culture filtrate was more effective on *Meloidogyne javanica* eggs than on juveniles. The role of *Trichoderma* in control of both nematode species was manifested by production of toxic metabolites and inhibition of nematode penetration and developments.

BC 33

FIELD APPLICATION OF A COMMERCIAL FORMULATION CONTAINING AN ISOLATE OF *BACILLUS THURINGIENSIS* FOR MANAGING *TYLENCHULUS SEMIPENTRANS* (CITRUS NEMATODE) ON NAVEL ORANGE TREES. Wafaa M.A. El-Nagdi and M.M.A. Youssef, Plant Pathology Department, Nematology Laboratory, National Research Center, Dokki, Cairo, Egypt, Email: wafaa_elnagdi@yahoo.com

Effect of a commercial formulation containing an isolate of *Bacillus thuringiensis* (agarin) was applied at the rates 1, 2 and 3 Kg/Feddan for management of the citrus nematode, *Tylenchulus semipentrans* on navel orange trees was evaluated under field conditions. Agarin at the intermediate rate (2 kg /feddan) proved to be most effective against the citrus nematode as it caused 47.9 and 40.3% reduction in the number of juveniles in soil and females in roots, one month after application, followed by those of the highest rate. At harvest, the same rate caused the highest reduction (70.8%) of the number of juveniles in soil compared to untreated check. Accordingly, intermediate rate of agarin achieved the highest rate of increase for fruit number, fruit weight per tree and fruit yield per feddan estimated at 180, 180 and 181.3%, respectively followed by those of the highest rate. The nematicide, carbofuran 10% granular at the rate of 40 Kg/Feddan achieved only 30, 30 and 31.3% for the above mentioned traits, respectively.

BC 34

MAIZE ROOT EXUDATES IN RELATION TO THE ACTIVITY OF SOME PATHOGENIC FUNGI AND *AZOTOBACTER CHROOCOCUM*. A.E.A. Ismail, B.E.A. Al-Laithy and Sahar M. El-Baz, Plant Protection Research Institute, ARC, Giza, Egypt, Email: ranahm58@hotmail.com

The effect of maize root exudates of two maize cultivars (SC10 and Balady) on the growth of certain pathogenic fungi (*Cephalosporium maydis* Samra, Sabet and Hingorani and *Fusarium moniliforme* Sheldon), which caused maize root and stalk rot diseases and *Azotobacter chroococum* as well as components of these exudates were studied. Root exudates of maize plants increased the dry weight of the pathogenic fungi and total count of *Azotobacter chroococum* cells. The exudates contained ten amino acids, reducing and non-reducing sugars, free and conjugated phenols as well as eight organic acids. The chemical component of the maize root exudates increased with plant age and the maize variety SC10 produced more root exudates than the Balady variety.

BC 35

ISOLATION OF ANTIBIOTIC PEPTIDES FROM *BACILLUS BREVIS* AND *BACILLUS POLYMYXA* INHIBITORY TO *BOTRYTIS CINEREA* IN STRAWBERRY. Wafaa M. Haggag, Plant Pathology Department, National Research Center, Dokki, Cairo, Egypt, Email: wafaa_haggag@yahoo.com

Gray mould caused by *Botrytis cinerea* is a devastating disease that results in extensive yield losses to strawberry. *Bacillus brevis* (*Brevibacillus brevis*) and *Bacillus polymyxa* (*Paenibacillus polymyxa*), which showed strong antifungal activity against *B. cinerea*, were isolated from phyllosphere of strawberry plants. The benefit of using these bacteria is due to the production of antimicrobial peptides is well documented. A study to assess the activity of both *Bacilli* and their antibiotic peptides produced against *B. cinerea* in strawberry plants *in vitro* and *in vivo* was conducted. *In vitro* bioassay, both *bacilli* have strongly inhibited pathogen germination, growth and extra-cellular enzymes production. *B. brevis* was generally the most effective in reducing *Botrytis* growth. Gramicidin S and polymyxin B peptide antibiotics were extracted from culture filtrates of *B. brevis* and *B. polymyxa*, respectively, purified by silica thin chromatography and identified by high performance liquid chromatography. Germination, growth rate and production of extra-cellular enzymes were more sensitive to both antibiotics. Gramicidin S was the most active against *B. cinerea* with a minimal inhibitory concentration of $15 \mu\text{mol l}^{-1}$. Polymyxin B also showed activity against *B. cinerea* at $25 \mu\text{mol l}^{-1}$. Under controlled conditions (18-22°C, 90% relative humidity and 12 h photoperiod), strawberry plants were sprayed with pathogen (10^5 spores/ ml), antagonists (from 10^5 to 10^8 cells/ ml) and antibiotic peptides (0 to $30 \mu\text{mol l}^{-1}$) for reducing grey mould. Disease incidence was decreased in the presence of *B. brevis*. Both antibiotic peptides inhibited *Botrytis* growth observed by scanning electron microscope. The plant leaves adsorbed significant amounts of antibiotics and ranged from 46.1 to 67.5% of the original solution. Under natural field conditions, these biocontrol peptides at different concentrations

were evaluated in 2003/ 2004 and 2004 / 2005 seasons against *Botrytis* grey mould. Treating plants with *B. brevis* exhibited a significant high activity against the development of *Botrytis* disease on strawberry. Gramicidin S showed a strong potential in reducing disease incidence, followed by Polymyxin B. Inhibition of *B. cinerea* by both *Bacilli* was similar to the use of equivalent levels of the antibiotics produced by them. In addition, these treatments significantly reduced the development of *Botrytis* and increased fruit yield. It can be suggested that *B. brevis* and *P. polymyxa* may be considered as potential biocontrol agents against *Botrytis* grey mould on strawberry based on the production of antifungal peptides. Therefore, gramicidin S and polymyxin B products are considered as biocontrol agents and may play significant role in the future as important components in strawberry management system.

BC 36

BIOLOGICAL CONTROL OF BEAN ROOT ROT. Nihal Y. Al-Murad¹ and Ali K. Al-Tae². (1) Plant Protection Department, College of Agriculture, University of Mosul, Iraq; (2) College of Science University of Mosul, Iraq, Email: nihaly04@yahoo.com

The control components studied significantly reduced the incidence of bean seedlings damping off. The result also showed that seed treatment with the bacterial agent *Bacillus subtilis* gave the lowest incidence with the fungus *F. solani*. The best combination of control components of *F. solani* was seed treatment with Benlate + soil treatment with *Trichoderma hazianum* + oil treatment with Al-Tahadi fungicide. For the control of *M. phaseolina*, the most effective was seed treatment with Benlate, followed by seed treatment with the bacterial agent *P. fluorescens*. Most of the combined dual and triple components which contained the fungicide Benlate together with other control components showed good results and were superior to the control treatment. Soil treatment with *T. hazianum* was superior to other individual treatments in case of *R. solani*. The best mixture of control components was seed treatment with Benlate and soil treatment with *T. hazianum*.

BC 37

BIOCONTROL OF FUSARIUM WILT OF TOMATO. Jahanshir Amini, Department of Plant Protection, Faculty of Agriculture, University of Kurdistan, Pasdaran St., P.O. Box 416, Postal cod: 66177-15175, Sanandaj, Iran, Email: aminij2002@yahoo.com

Fusarium oxysporum f.sp. *lycopersici* (FOL) is a soil borne pathogen causing wilting occasionally accompanied with severe yield loss in tomato. Biological control of Fusarium wilt diseases is an alternative disease management strategy. In this research, Antagonistic effects of 9 isolates of *Pseudomonas fluorescent*, *Bacillus subtilis* and *Serratia marcescens* were tested in vitro and in vivo against Fusarium wilt of tomato. Antagonistic test between bacteria and pathogen in vitro were tested on King's medium B (KB) and Potato dextrose agar against FOL. Colony area was recorded, compared with control and percentage inhibition of growth was calculated. In greenhouse experiments, root of 3-week-old tomato plants were cut and dipped in bacterial suspension with a concentration of 10^6 CFU/ml for 30 min. Seven days later, tomato roots plants recut and dipped in conidial suspension of FOL with a concentration of 10^6 spores/ml. Disease severity was assessed 4 weeks after inoculation by determining the leaf disease index, plant height and vascular discoloration. The experiment was carried out in a completely randomized design in pots under greenhouse conditions and treatments were analyzed by the program MSTATC. The *P. fluorescent* was reisolated from tomato stems after seven days in a concentration of 10^4 CFU/ gr fresh weight. In vitro, percentage of growth inhibition varied significantly among the antagonistic isolates and ranged from 20 to 60%. Isolates W34, CW2, 14 and WB1 of *P. fluorescent* showed antagonistic effects in vitro and in vivo against FOL. The results obtained indicated that four selected isolates of *P. fluorescent* were capable to reduce severity of disease with an efficiency ranging from 2 to 8 times and stimulate plant growth up to 3 times in comparison with infected control, whereas isolates of *B. subtilis* and *S. marcescens* were not consistently effective.

BC 38

A STUDY OF LAVANDULA OFFICINALIS ESSENTIAL OIL COMPOUNDS EFFECT ON FIRE BLIGHT'S DISEASE. Rouhollah Karami-Osboo¹ and Mehdi Khodaverdi². (1) Plant and Pest Disease Research Institute, Yaman St., Chamran Ave, Tehran, Iran; (2) Azad Islamic University, Tehran, Iran, Email: karamiosboo@yahoo.ca

Plant volatile oils have been recognized since antiquity to possess biological activities. Fire blight is a bacterial disease caused by the bacterium *Erwinia amylovora* which can seriously damage apple and pear orchards in a single season. Several chemicals including copper compounds and antibiotics are used for control of fire blight but except for streptomycin, there is still no registered product that can effectively control the disease. The essential oil of *Lavandula officinalis* has an effect on this bacterium, and accordingly *Lavandula officinalis* essential oil was obtained by water distillation for this purpose. GC-MS analyses was carried out to determine the composition of the essential oil. By column chromatography the essential oil compounds were separated and each fraction affected *Erwinia amylovora*. This paper will present results of the analyses of the *lavandula officinalis* essential oil and the effect of oil components on fire blight bacterium.

BC 39

SELECTION OF ANTAGONISTS AGAINST PENICILLIUM EXPANSUM AND BOTRYTIS CINEREA, TWO POSTHARVEST APPLE PATHOGENS. El-Hassan Achbani¹, Rabia Mounir^{1,3}, Samir El Jaafari², Allal Douira³, Abdellatif Benbouazza¹ and Haissam Jijakli⁴. (1) Bacterial disease and biological control Laboratory, Center of agronomical research of Meknes (INRA), P.O. Box 578 Meknes, Morocco, Email: achbani5@yahoo.fr; (2) Laboratoire de Biotechnologie et Amélioration des Plantes (UMI-BAP), Université Moulay Ismail, BP 4010, Meknès, Morocco; (3) Laboratoire de Biologie et de Protection des Cultures, Université Ibn Tofail, Faculté des Sciences, BP: 133, 14000 Kénitra, Maroc; (4) Unité de Phytopathologie, Faculté universitaire des Sciences Agronomiques, Passage des Déportés, 2, B-5030 Gembloux, Belgique.

The potential antagonistic micro-organisms (33 isolates) of yeast, bacteria and fungi were isolated from apple surface. Six yeasts (all strains Ach1-1, Ach2-1, Ach2-2, 1112-3, 1113-10 and 1113-5) showed a high level of protection (more than 80%) at 25°C, against *P. expansum* or *B. cinerea* for 5 days. The highest level of protection against *P. expansum* (96%) was observed with the application of the isolate Ach 2-1. Six days after *B. cinerea* inoculation, strains Ach 2-2 and Ach 2-1 insured 100% and 96% protection, respectively. At lower temperature (5°C), protection rate observed after apple treatment with those antagonistic strains were ranged from 82% to 94%, 20 days after *P. expansum* inoculation. Strains Ach1-1 and 1113-5 were retained as the best antagonists for the subsequent studies.

BC 40

EFFECT OF OLIVE RESIDUES ON THE GROWTH OF SOIL-BORNE FUNGI AND TOMATO SEEDLINGS. Sabah Almaghribi, Plant Protection Department, College of Agriculture, Lattakia, Syria, Email: tabbache@scs-net.org

The effect of mill wastewater and pomace on the growth of five species of fungi and tomato plants grown in pots were investigated under laboratory conditions. Mill wastewater and pomace inhibited fungi growth except *Trichoderma* sp. The inhibited fungi were *Alternaria*, *Fusarium*, *Botrytis* and *Sclerotinia*. The inhibition effect was also observed on the growth of tomato seedlings, and tomato seedlings died one week after treatment. The treatment reduced shoots and roots length. Mill wastewater reduced fresh weight by 4-39.8%, whereas olive pomace reduced fresh weight by 4.6-76.3%.

BC 41

BIOLOGICAL CONTROL WITH THE BACTERIA *BACILLUS SUBTILIS*, *MICROCOCCUS SPP.*, *CORYNEBACTERIUM SPP.* AGAINST *RHIZOPUS STOLONIFER* ASSOCIATED WITH BARLEY (*HORDEUM VULGARE*) GRAINS IN MISURATA, LIBYA. Taher M. Alhubge and Adel O. Ashoor, Department of Microbiology, Faculty of Science University of 7th October, Misurata, Libya, Email: aoammg76@yahoo.com

This present study was carried out to evaluate the efficiency of the antagonistic effect of the bacteria *Bacillus subtilis*, *Micrococcus* spp., *Corynebacterium* spp. on the inhibition of *Rhizopus stolonifer*

associated with barley grains, and also to evaluate their effect on germination of grains in comparison with three fungicides: Topsin, Benlate and Dithane M45. Four samples of barley grains from four different areas in Misurata, in addition to, four soil samples from the same areas were used in this study. A number of bacterial and fungal isolates, such as *Bacillus subtilis*, *Micrococcus* spp., *Corynebacterium* spp. that has inhibitory effect on *Rhizopus stolonifer* in Petri plates containing PDA were obtained. Compared with control samples and fungicides used, the bacterial species used showed a good inhibitory effect against *Rhizopus stolonifer*. The filtrates also showed no diverse effect on grain germination. Future studies are still needed to make sure that these antagonistic species has no negative side effects.

BC 42

POTENTIAL BIOLOGICAL CONTROL OF CHAROAL ROT DISEASE (*MACROPOMINA PHASEOLINA*) UTILIZING INDIGENOUS ANTAGONISTIC MICROORGANISMS IN JORDAN.
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Charcoal Root Rot (CRR) disease of vegetables, fruits, field and fiber crops is caused by a soil borne pathogen, *M. phaseolina*. This pathogen was isolated from samples of infected plants collected from different locations of northern Jordan and Jordan valley. The pathogen was identified to species level using specific primers and its pathogenicity was confirmed. CRR is an important disease problem, difficult to manage and control in Jordan and worldwide. There are no resistant cultivars or effective fungicide against this pathogen, and the pathogen is capable to survive in the soil for several years under adverse conditions in form of microsclerotia. Thus, biocontrol measures are sought to be a promising alternative control agent for this pathogen. Non pathogenic fluorescent Pseudomonads and Actinomycetes (mostly *streptomycetes*) were cited as potential biocontrol agents against this disease. Present investigation carried *in vitro* revealed that the later one is an active Chitinase producer and capable to inhibit the growth of *M. phaseolina*. The Pseudomonads, on the other hand suppressed the growth of mycelium and or/ sclerotia formation. Under artificial inoculation using cucurbit plant with bacteria added into the soil, the disease incidence ranged from low levels (20%) in case of bacterial isolates No. 40, 17, 38 and high levels (80%) in case of bacterial isolates N. 12, 35 compared to the control which showed 100% incidence. Such lines of research opens avenues into further in depth basic research and possibly practical biocontrol products.

BC 43

BIOLOGICAL CONTROL OF ROOT-ROT DISEASES ON WILLIAMS BANANA (*MUSA* SPP).
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Three mainly identified fungi, i.e. *Fusarium moniliforme* (Schlect), *Fusarium solani* (Martius) and *Rhizoctonia solani* (kuhn) were isolated from Williams variety of banana, and from banana plantations in Agricultural Research Station Farm in El-Kanater El-Kairia. *Bacillus subtilis*, *Trichoderma harzianum*, *saccharomyces cervisiae* and *streptomycetes scabies* inhibited the linear growth of root-rot fungi. The growth of *F. moniliforme*, *F. solani* and *R. solani* was completely inhibited in medium that contained *Bacillus subtilis* 2.5 g/l water. *Streptomycetes scabies* was the least effective, followed by *saccharomyces cervisiae*. The greatest inhibitory effect was observed in the case of *B. subtilis* with increase in concentration to 2.5 g/l water. Application of the different bio-agent under green-house conditions on soil treated to control the root-rot caused by three fungi, revealed that irrigation with water containing *Bacillus subtilis* (2.5 g/l) decreased the disease severity of the three pathogens compared to the control. It should be concluded that the most effective bio-agent was by using irrigation with water containing *B. subtilis*.

BC 44

EFFICACY OF SOME ANTAGONISTIC ISOLATES OF BACTERIA AND FUNGI FOR CONTROLLING PEANUT DISEASES. Medhat S. Abd El-Megid¹, A.G. Rahal², Nashwa A.H. Fetyan² and M. Fadel³. (1) Plant Pathology Research Institute, Agriculture Research Center, Giza, Egypt; (2) Soils, Water and Environ Research Institute, ARC, Giza, Egypt; (3) Microbial Chemistry Department, National Research Center, Dokki, Cairo, Egypt, Email: omniamedhat2006@yahoo.com

Thirteen isolates of antagonistic bacteria *Bacillus subtilis*, *B. thuringensis* and fungi were tested on pre- and post-emergence damping-off, root rot and pod rot diseases of peanut. Although, Clean Root and Rizolex T were used, *Bacillus thuringensis* (isolate no. 536), *B. subtilis* (isolate no. 50) and *Trichoderma ressi* were superior treatments in decreasing damping-off infection. Root rot infection was decreased by *Bacillus subtilis* (no. 50), *B. thuringensis* (536) and Clean Root. All treatments decreased rate of pod rots in two successive seasons by 19.3-58.0 and 17.2-54.2%, respectively. Significant increase in yield was recorded when *B. subtilis* (nos. 49 and 22), *Bacillus thuringensis* (nos. 341 and 536) and *T. ressi* were used. Considerable increases in shoot length, fresh and dry weight of shoots and roots were recorded in all treatments when compared with the control. Seed treatment with any of tested the bioagents exhibited low values in nitrogenase compared with control in the soil. Peanut seed treated with antagonistic bacteria and fungi increased total count of bacteria except Clean Root and Rizolex T. Treatments with *B. thuringensis* (nos. 341 and 536) produced the highest total count of bacteria. Whereas, the use of *B. subtilis* (no. 47 and 64), *T. ressi* and *B. thuringensis* (no. 133 and 341) led to increase in fungi numbers compared to other treatments.

BC 45

ANTIFUNGAL ACTIVITY OF FENAZINES EXTRACTED FROM PSEUDOMONAS AUREOFACIENS STRAIN. Abdelhadi Guéchi and Samia Mezaache, Laboratory of Microbiology and Phytopathology, Faculty of Sciences, University Ferhat ABBAS, 19000, Setif, Algeria, Email: guechi.abdelhadi@caramail.com

Pseudomonas aureofaciens isolated from potato rhizosphere had an antifungal activity *in vitro* against two phytopathogenic fungi; *Fusarium oxysporium* and *Fusarium solani* – causal agents of dry root rot of potato. This activity was altered after treatment of *Pseudomonas aureofaciens* strain by ciprofloxacin, which induced mutants that were not able to produce phenazines. Results showed that *Pseudomonas aureofaciens* was a wild strain, and it was able to inhibit the growth of two fungi by producing of three types of phenazines.

BC 46

BIOLOGICAL CONTROL OF BROWN STEM ROT DISEASE OF SOYBEAN CAUSED BY PHIALOPHORA GREGATA. Ahmed M. Hassanien¹, M.A. Baraka² and M.A. Abd El-Al¹. (1) Plant Pathology Research Institute, Agricultural Research Center, Giza, Egypt; (2) Agriculture Botany Department, Faculty Agriculture, Suez Canal University, Ismailia, Egypt, Email: ahmedhassanein48@yahoo.com

Brown stem rot disease of soybean caused by *Phialophora gregata* is an important disease, which cause serious yield losses that can reach 37%. Four biocontrol agents were evaluated in controlling of soybean brown stem rot caused by *P. gregata* under laboratory and greenhouse conditions. Data showed that *Trichoderma harzianum*, Biozeid (*Trichoderma album*), *Gliocladium virens* and Bioarc (*Bacillus megaterium*) caused significant reduction in mycelial radial growth of *P. gregata* on PDA medium. Under greenhouse conditions, *T. harzianum*, *G. virens*, Biozeid and Bioarc as seed or soil treatments significantly decreased damping-off and brown stem rot disease severity, and improved plant growth characteristics such as plant height, fresh weight and dry weight.

BC 47

EFFECT OF THREE BIOCONTROL METHODS AGAINST FUSARIUM WILT OF CUCUMBER.

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Three biocontrol products, plant extract (garlic juice), fungal bioagent (*Trichoderma harzianum*), and non-pathogenic strain of *Fusarium oxysporum* were tested in controlling cucumber wilt disease incited by *Fusarium oxysporum* f.sp. *cucumerinum* and compared to the fungicidal application with Carboxin / thiram as a standard treatment. Twelve isolates of the pathogen were obtained from three Governorates and tested for their pathogenicity. Although, the use of carboxin/thiram was the best disease treatment, the non-pathogenic strain of *F. oxysporum* showed promising results concerning disease reduction. Garlic juice proved to be less effective followed by the bioagent *T. harzianum* without significant differences between each other. This study aimed to make use of the best non-chemical treatment as a safe alternative to fungicides in order to avoid environmental pollution and reduce health hazards.

BC 48

PANTOEA AGGLOMERANS (HIP32) AND BACILLUS SUBTILIS (LIR225) BACTERIAL STRAINS PROMISING BIOCONTROL AGENTS IN THE SOIL.

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Bacillus subtilis and *Pantoea agglomerans* were reported as effective and strong biocontrol agents against many plant pathogens and now commercial products of both strains are available around the world. Strains LIR225 was isolated from soil rhizosphere of olive trees from Benghazi and HIP32 was isolated from phylloplane of apple trees from Budapest, Hungary, were characterized and tested for safety and effectivity as biocontrol agents on plants and in the soil. Their viability in the soil was tested in 4-independent experiments and their efficacy on recovery of *Clavibacter michiganensis* subsp. *michiganensis* (cm³) the causal agent of bacterial canker of tomato and *Xanthomonas vesicatoria* (SO8) the causal agent of leaf spot disease of tomato and pepper were evaluated. In sterile sandy fallow soil type pre-characterized and determined its water absorbance capacity, treatments of fresh culture growth and SO8 were mixed with each of LIR225 and HIP32 in separate treatments. Then 0-time sample was taken and for 5-weeks the growth of pathogens on Nutrient agar supplemented with antibiotics was monitored; Nitrofurantoin was used to inhibit growth of SO8, and Licomycin to inhibit the growth of (cm³) and they also inhibit the growth of the two biocontrol strains. Numbers of colony forming units were counted for antagonistic efficacy compared to control. Strains LIR225 and HIP32 effectively reduced growth of strain SO8, and were moderately effective against (cm³) which were recovered and reisolated from treated soil, their affectivity was more pronounced after 3-weeks samplings showing promising results against bacterial diseases. No resistant colonies were found in these experiments.

BC 49

STUDY OF THE INHIBITING EFFECTS OF THREE SPECIES OF BACILLUS ON THE GROWTH OF ASCOCHYTA RABIEI.

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The chickpea is a leguminous plant intended for human consumption. It provides a large part of proteins, in addition it enriches the soil with nitrogen. This plant is unfortunately attacked by a fungus (*Ascochyta rabiei*) which causes a serious disease (*Ascochyta blight*). Under certain conditions favorable to the development of the pathogen, it can destroy the whole chickpea crop. Various control methods (chemical or genetic) were used but they were confronted with the appearance of new physiological races. The aim of our research is to develop other methods such as biological control, based on natural antagonistic micro organisms. The fungal pathogen can be controlled by using its natural enemies such as viruses, bacteria or other fungi. In this work, 2 strains (S1 and S 2) of *Ascochyta rabiei* were used with 3 *Bacillus* species. Fragments of mycelium put in contact with the 3 species of bacteria on culture medium, in addition to control (without bacteria). After incubation, the 3 *Bacillus* species inhibited the growth of *Ascochyta rabiei* mycelium at varying degrees according to the species and strains. The most antagonistic species was

Bacillus subtilis which inhibited the mycelium growth of both strains. The species *B.circulans* (S1 strain) and *B. firmus* (S2 strain) were less effective at the mycelial growth of the 2 strains, and was close to that of the control.

BC 50

POSSIBILITY OF MICROBIOLOGICAL CONTROL AGAINST THE BAYOUD DISEASE OF THE DATE PALM CAUSED BY *FUSARIUM OXYSPORUM* F.SP *ALBEDINIS* AND OTHER *FUSARIUM* WILT. Moulay Hassan Sedra, Arab Organization for Agricultural Development (AOAD), and Institut National de Recherche Agronomique (INRA), Laboratory of Phytopathology, Genetics and Integrated control, Centre Régional de Marrakech INRA, Marrakech, Morocco, Email: mhsedra@yahoo.fr, sedramh@hotmail.com, sedramh@menara.ma

The bayoud is considered among the most dangerous diseases of the date palm, which is difficult to control. In spite of the selection of some resistant varieties, many commercially known varieties and new clones of good fruit quality are susceptible to the disease and are threatened by the spread of the Bayoud and its strains of high aggressiveness. In order to protect and to exploit these precious varieties against this threat, the microbiological control against this disease was exploited. The results of the control trials under greenhouse, using antagonistic microorganisms, showed that the disease incidence on the date palm trees can be significantly reduced in comparison with fungicide treatments. These antagonists showed their ability to also protect tomato and the linen against similar pathogens.

BC 51

BIOLOGICAL CONTROL OF *FUSARIUM OXYSPORUM*. F.SP. *ALBEDINIS* WITH *TRICHODERMA HARZIANUM* AND *TRICHODERMA VIRIDE*. Maha Rashid Mohsen¹, Taxenna Abdellaziz¹, and Beka Mobarek². (1) Department of Biology, University of Sétif, 19000, Algeria, Email: taxenna@yahoo.fr; (2) Department of Biology, University of Constantine, 25000, Algeria.

Date palm (*Phoenix dactylifera* L.) grows widely in the North African countries, is considered as an important source of food for the population. However, it remains the target of numerous fungal infections, essentially by the *Fusarium oxysporum*. f. sp. *albedinis*, caused agent of wilt disease (bayoud). This fungus has been isolated on malt extract agar, from the infected rachises. Purified with single spore isolation method and identified according to the macroscopic and microscopic features. This is characterized by a new morphological aspect related to the pink colour of the colony which turns at end of growth to purple, and a reduction of the macroconidial size and loosing of its initial shape. On the other hand. *Trichoderma harzianum* and *T. viride* have shown an important inhibitory effect on the growth of foa.

BC 52

FORMULATION OF *TRICHODERMA HARZIANUM* AND *PECILOMYCES LILACINUS* FOR USE AS BIOPESTICIDES. H. M. Aboud and H.M Saleh, Directorate of Agricultural Research and Food Technology, Ministry of Science and Technology, P.O. Box 765, Baghdad, Iraq, Email: hadimahdiaboud@yahoo.com

The results of evaluation eight formulations of two biocontrol agents *Trichoderma harzianum* and *Pecilomyces lilacinus* using some agricultural by-products as food base and carrier agents revealed that the mixture of fungal inocula and cracked corn cob and wheat bran (1:2.5: 0.5/w: w: w) was superior in increasing both population and biocontrol activity of these biocontrol fungi than other tested preparations. This *T. harzianum* formulation induced significant reduction in tomato wilt disease caused by *Rhizoctonia solani* and significant increase in root and shoot dry weight of tomato plants. The same formulation for *P. lilacinus* induced significant reduction in tomato root knot disease caused by *Meloidogyne javanica* and significant increase in shoot dry weight. According to these results this formulation was recommended for soil application for these two biocontrol agents.

BC 53

THE EFFECT OF DIFFERENT LEVELS OF PH AND ELECTRICAL CONDUCTIVITY ON GROWTH AND SPORULATION OF *TRICHODERMA* SPP. H.Z.A. Hafedh, H.M. Aboud, N.K. Musa, F.H. Gasam and H.M. Abid, Directorate of Agricultural Research and Food Technology, Ministry of Science and Technology, P.O. Box 765, Baghdad, Iraq, Email: Hamdiazali@yahoo.com

The effects of three pH levels of (4, 6, 8) and E.C (12.92, 14.30 and 17.8) on two fungal growth parameters (radial growth and sporulation) for 34 isolates of *Trichoderma* spp. on PSA medium were evaluated. Results showed that pH 6 was optimal for these tested growth parameters, while pH 8 showed significant reduction in the growth parameters as compared with pH 4. The results also revealed that E.C. 17.8 significantly reduced these parameters as compared with E.C. 12.92 and 14.30. These explained the reduction in biocontrol efficacy of these fungi in saline-alkaline soils.

BC 54

EFFECT OF PHOSPHATE SALT, PROPOLIS EXTRACT AND BIOAGENT FILTRATES FOR CONTROLLING CUCUMBER POWDERY MILDEW CAUSED BY *SPHAEROTHECA FULIGINEA* UNDER GREEN- AND COMMERCIAL- PROTECTED HOUSES. A.M.M. Mahdy, M.H. Abd El-Mageed, Faten M. Abd El-Latif and G.M. Ashour, Agriculture Botany Department, Faculty of Agriculture, Benha University, Egypt, Email: abdou_mahdy@hotmail.com

Two experiments were carried out during the 2003 spring and autumn seasons. In the first season, the effect of potassium phosphate salt (K_2HPO_4), propolis extract (antifungal), filtrate of two bioagents (*Bacillus subtilis* and *Trichoderma harzianum*), separately, or in combination with propolis and bioagent filtrates on conidia germination of *Sphaerotheca fuliginea*, causal agent of cucumber powdery mildew disease were studied under laboratory conditions. In the second experiment, three groups of cucumber plants cv. Primo (4 weeks old) were grown under commercial protected houses. First group of plants were sprayed with potassium phosphate salt, K_2HPO_4 (as resistance-inducer) at concentrations of 50, 75 and 100 mM. Second group of plants were sprayed with propolis extract (antifungal) at a concentration of 5000 ppm, or with filtrate of two bioagents (*Bacillus subtilis* or *Trichoderma harzianum*), separately or combine propolis with each bioagent filtrates or the three together. Third group of plants (control treatments) were sprayed with tap water or with Topas fungicide at rate 12.5, 25 and 50 ml/100 l. A significant reduction in the conidia germination rate, powdery mildew incidence, and its severity were achieved by increasing the concentration of potassium phosphate salt (K_2HPO_4), or by application of propolis extract, filtrate of two bioagents (*Bacillus subtilis* or *Trichoderma harzianum*), or combination of propolis with bioagent filtrates.

BC 55

STUDY ON ANTAGONISTIC EFFECTS OF SOME BACTERIAL ISOLATES ON COLLAR AND ROOT ROT OF MULBERRY TREES. Afsane Merat¹, Mostafa Niknejad Kazempour² and Esmail Kamran¹. (1) Iran Silkworm Research Center, P.O. Box 41635-1763, Rasht, Guilan, Iran, Email: merat2530@yahoo.com; (2) Plant Pathology Department, College of Agriculture, Guilan University, Iran.

In this study, the antagonistic effects of five bacterial isolates procured from rhizosphere of mulberry trees were investigated on four fungi causal agents of collar and root rot of mulberry. Three isolates, M-30, M-39 and M-163 were assigned to the *Pseudomonas* genus, and two isolates, M-148 and Pi-5 were assigned to the *Bacillus* genus. Investigation of bacterial antibiotic effects on the pathogenic fungi *in vitro* showed that the most inhibiting effects on growth of *Lasiodiplodia theobromae*, *Fusarium solani*, *F. oxysporum* and *Rhizoctonia solani* were achieved by application of M-148 isolate (93.70%), Pi-5 isolate (80.76%), and M-163 isolate (60.78%). Under greenhouse conditions, inhibition of disease development caused by *L. theobromae*, *F. oxysporum*, *F. solani* and *R. solani* could be obtained by using M-30, M-39, and Pi-5 isolates, with an inhibition rate of 58.33, 48.83 and 60.87%, respectively.

BC 56

EFFECT OF GROETH RETARDANT CULTAR AGAINST FABIA BEAN ROOT ROT FUNGI UNDER SHADE CONDITIONS AND MODE OF ACTION ON HOST AND PATHOGEN. Huria H. Al-Jboory, Kamil S. Juber and Muhhialdeen A. Abaas, Department of Plant Protection, College of Agriculture, University of Baghdad, Abu Ghraib, Baghdad, Iraq, Email: hhaljboory@yahoo.com

The study was carried out in the field of College of Agriculture, University of Baghdad during 2000-2001. The effect of the growth retardant Cultar to protect broad bean plants from infection with root rot fungi under shade condition and detect the mode of action on host and pathogen were investigated. Results confirmed that the seed treatment with growth retardant Cultar (concentration 25 mg/l water) protected seed from the soil pathogens *Fusarium oxysporium*, *F. semitectum*, *F. solani* and *Rizoctonia solani* and a mixture of *F. solani* and *R. solani* and increased seed germination rate and decreased disease severity compared with the control treatment. The range of germination rate was 30-62.5% and disease severity 26-39% in inoculated treatment, whereas seed germination rate ranged 22.5-57.5% and disease severity 37-56.5% in the control treatment. Dissection of stems and roots of broad bean plants treated with Cultar showed increased thickness of epidermal cell walls and pith compared with control, and increased cell number of xylem and phloem.

BC 57

THE BIO ANTAGONISTIC EFFECT OF THREE LOCAL CLONES AND ONE FOREIGN CLONE OF *TRICHODERMA* SPP. TO *VERTICILLIUM DAHLIA* KLEB WHICH CAUSES OLIVE WILT IN THE LAB. Hussain hallak, Baha Edin Alnass and Yaser Jabas, GCSAR, Department of Olive Research, Idlib, Syria, Email: h-hallak@maktoob.com

Olive wilt, caused by *Verticillium dahliae* kleb, is one of the important diseases which attack olive trees in Syria and causes die-back. Biological control is an environment friendly to control *V. dahliae* in the soil. Three local clones were isolated from the coastal region T3, T5, T9 and a foreign clone TB of *Trichoderma* spp. were used. The effect of these clones was tested on *V. dahliae* in the lab, and the results obtained were as follows: 1) Spores germination of local clones T3, T5, T9 dominated over the spores of *V. dahliae*, when placed together on liquid medium (PD). The competitive effect of clone TB was rather weak. 2) Mycelial growth of *Trichoderma* clones dominated over *V. dahliae* mycelium and stopped its growth on PDA. 3) Volatiles produced by the *Trichoderma* spp. clones inhibited the growth of *V. dahliae*.

BC 58

SUPPRESSION OF *MELOIDOGYNE INCOGNITA* BY SOIL APPLICATION OF *PASTEURIA PENETRANS* IN AL-QSSIM AREA, SAUDI ARABIA. Suloiman Al-Rehiyani, Plant Production and Plant Protection Department, Al-Qassim University, College of Agriculture and Veterinary Medicine, Buraidah, P.O. Box 1482, Saudi Arabia, Email: alreh@yahoo.com

Pasteuria penetrans is an important biological control parasite of root-knot nematodes. The root-knot nematode *Meloidogyne javanica* is a serious pest problem in Al-Qassim vegetable and agronomic production systems. The potential of *Pasteuria penetrans* isolate from Al-Qassim area for suppressing *M. incognita* was investigated in two greenhouse experiments. In the first experiment, the effect of *Pasteuria* was evaluated over 3-year period by monitoring nematode population (J2s) every two months in 20 kg potted soil. *Pasteuria penetrans* was inoculated in the first year only using infested field soil at four rates, 0, 3.75, 7.5, 11.25, and 15 kg soil per pot. Three Eggplant seedlings were planted in each pot and inoculated with 20,000 J2s of *M. incognita*. In the second experiment, root gall index and egg-masses of *M. incognita* was determined ten weeks after planting eggplants in pots infested with the nematode and treated with endospores of the bacterium. Soil and roots mixed with the bacterium was added at several rates (20, 40, 60, 80 and 100%). In the first experiment, results indicated that the number of second-stage juveniles (J2s) having *Pasteuria* attached increased with increasing inoculum levels. *Pasteuria penetrans* significantly reduced the densities of J2 six months after inoculation and the treatment with the highest rate had the lowest numbers. At the end of third year, treatments with higher rates (11.25 and 15 kg) had the highest rate of dead and infected J2s (90% and 100%, respectively). In the second experiment, results showed that all *Pasteuria* treatment significantly reduced root galling and egg masses of the nematode. There was a negative linear relationship between *Pasteuria* concentration and number of galls and egg masses. This study has

provided evidence that *Pasteuria penetrans* isolate from Al-Qassim area has the potential to suppress *M. incognita* population, but further field data is needed to determine the actual number of the bacterium endospores required for effective nematode suppression.

BC 59

EFFECT OF ANTAGONISTIC BACTERIA COMBINED WITH COMPOST OR MINERAL FERTILIZERS ON SOME COTTON SEEDLING DISEASES. M. S. Mikhail¹, K. K. Sabet¹, Maggie E. Mohamed², Mona H. M. Kenawy³, Kh. K. Kasem⁴. (1) Plant Pathology Department, Cairo University, Egypt, Email: kaldkas5@hotmail.com; (2) Plant Pathology Research Institute, ARC, Giza, Egypt; (3) Soil, Water, and Environment Research Institute, ARC, Giza, Egypt; (4) General Commission for Scientific Agricultural Research, ARC, Hamah, Syria.

Application of antagonistic bacteria combined with compost and/or mineral fertilizers significantly reduced cotton seedling diseases incidence and increased healthy survival of plants compared with untreated plants (control), except for *Azospirillum* sp. combined with mineral fertilizers and *Bacillus polymyxa* combined with mineral fertilizers and compost. Moreover, *Bacillus subtilis* and *Pseudomonas putida* combined with compost produced the highest rate of healthy surviving plants (82.5%). Some treatments increased plant height, fresh and dry weight of plants compared with untreated plants in both infested and noninfested soil. Both macro-nutrients and micro-nutrients in soil and plants was affected as a result of application of antagonistic bacteria with compost or minerals. In most treatments macro-nutrients (nitrogen, phosphorus and potassium) were increased in soil and plants. At the same time micro-nutrients (manganese, zinc and iron) increased in soil and plants compared with untreated control.

BC 60

RELATIONSHIP BETWEEN HOST AND BIOCONTROL AGENT OF RHIZOCTONIA DISEASE OF COTTON SEEDLINGS. Fakhri Raheem Hameed¹, Mohammed A. Al-Hamdany² and Farkad A. Fattah³. (1) College of Science, Diyala University, Iraq; (2) Plant Pathology Department, Agriculture and Food Technology Directorate, Ministry of Science and Technology, P.O. Box 765, Baghdad, Iraq, Email: ma_alhamdany@yahoo.com; (3) College of Agriculture, Baghdad University, Iraq.

Probable occurrence of a relationship between four isolates of *Trichoderma* spp. and cotton cultivars, and the possible utilization of peroxidase activity in Rhizoctonia infected cotton tissues as an indicator for host reaction instead of disease incidence were investigated. Results of disease control against *Rhizoctonia solani* in cotton seedlings by the isolates TV, T160, T194 and T211 with the biopesticide Tahadii significantly confirmed a clear relationship between the isolates and the cultivars used. The first three isolates were the best biocontrol agents against *R. solani* in cultivars Cocker 310, Lashata, and Tamim 4959. However, the four isolates and biobesticide Tahadii failed to reduce disease incidence in Ashor cultivar. In spite of the similarity of disease incidences recorded on Tamim 4959 and Cocker 310 cultivars (50%), data on peroxidase activity in Rhizoctonia infected tissues revealed different disease responses. Tamim 4959 appeared to be more susceptible than Cocker 310. The peroxidase activity in Tamim infected tissues (591.5 enzyme unit/min/gm fresh tissues) was 2.8 folds than that observed in Cocker 310.

BC 61

PLANT RHIZOBACTERIA (PR) FOR THE CONTROL OF COTTON *FUSARIUM WILT* AND BACTERIAL LEAF STREAK OF WHEAT UNDER *IN VITRO* CONDITIONS IN SYRIA. Salah Eddin Khabbaz^{1&2}, D. Ladhakshmi¹, V. Valluvaparidasan¹, Bassam Bayaa² and Ahmed El-Ahmed². (1) Department of Plant Pathology, Centre for Plant Protection Studies, Tamil Nadu Agricultural University, Tamil Nadu, Coimbatore, 641 003, India, Email: salah_edk@yahoo.co.uk, salahthalal@rediffmail.com; (2) ICARDA, P.O. Box 5466, Aleppo, Syria.

Twenty eight soil samples were collected from major cropping areas of Syria, and antagonistic bacteria against Cotton *Fusarium wilt* caused by *Fusarium oxysporum* f. sp. *vasinfectum* and bacterial leaf streak of wheat caused by *Xanthomonas translucens* were isolated. The crops planted in the investigated region include wheat, cotton, sunflower, potato, corn, sugar beet, garlic, Lucerne, watermelon, chick pea, lentil, faba bean and barley. Fifty eight isolates were collected and observed for morphological and colony

characteristics. These isolates were tested against the selected pathogens under *in vitro* conditions. Out of 58 isolates, two of them (SH-16 and SL-22) showed promising results by producing strong inhibition zone in dual culture technique. The isolate SH-16 was identified as *Bacillus subtilis* and SL-22 identified as *Pseudomonas fluorescens* by morphological, biochemical and molecular methods.

Control of Insects

C 1

USING MICROWAVE ENERGY FOR CONTROL THREE BURGOL PRODUCTS INSECTS. Aead Y. Ismail, Biology Department, Education College, Mosul University, Mosul, Iraq, Email: aeadismail@yahoo.com.

Three levels of microwave energy (260, 520 and 780 w) were used to control adults of the saw-toothed grain beetle (*Oryzaeophilus surinamensis* (L.)), Red flour beetle (*Tribolium castanum*) (Herbst), the Khapra beetle (*Trogoderma granarium*) (Evert) in Burgol local products (Jrush, Burgol and Habia) in three treatment periods (1, 1.5 and 2 minutes). Results showed that the highest killing effect was on *Oryzaeophilus surinamensis* (75.67%), than on *Tribolium castanum* (68.64%), and the lowest killing effect (66.29%) was on *Trogoderma granarium*. 780 w microwave energy level gave 100% killing effect, while 520 w energy level gave 99.63% killing effect, and only 10.98% killing effect was recorded for 260 w level. Highest killing effect in Burgol products was in Burgol (71.48%), followed by Habia (67.9%). Treatment periods tested revealed that the killing effect were 75.18, 68.64 and 66.79% with 1.0, 1.5 and 2 minutes, respectively. This study also showed that the effect of temperature increase was almost similar in all Burgol product (69.77-72.77 °C), whereas temperature in the control treatment was 25.33 °C. Temperature was 87.08, 62.41 and 31.83 °C for 260, 520 and 780 w microwave treatments, respectively.

C 2

INERT DUSTS TO CONTROL STORED PRODUCT INSECTS OF WHEAT. Riyad Ahmed Al-Iraqi¹ and Salem Qasim Al-Naqib². (1) Department of Biology, College of Science, Mosul University, Mosul, Iraq, Email: riyadaliraqi@yahoo.com; (2) Research Center for Environment and Water Resources, Mosul University, Iraq.

The use of natural mineral inert dusts is considered one of the new methods for protection of stored grains from insect pests infestation. Four local rocky dusts were evaluated against four storage insects. Ninivite dust proved to be the most effective of the tested dusts and gave LC₅₀ 0.12, 0.14, 0.06 and 0.08% for each of *T. confusum*, *T. granarium*, *O. surinamensis* and *R. dominica*, respectively, while bentonite dust showed the lowest effect and gave LC₅₀ of 0.74, 0.85, 0.13 and 0.20 for the same insect species, respectively. The effectiveness of tested dusts is arranged in the following descending order: ninivite, kaolinite, montmorillonite and bentonite. The effect of ninivite dust on *O. surinamensis* was 2.41, 2.0 and 1.4 times more than *T. granarium*, *T. confusum*, *R. dominica*, respectively. The use of ninivite dust to prevent insect infestation in stored grains is recommended as a successful alternative to insecticides.

C 3

ECONOMICAL IMPORTANCE OF THE INCREASING NUMBER OF CHEMICAL SPRAYS FOR THE CONTROL OF POMEGRANATE FRUIT WORM *ECTOMYELOIS CERATONIAE* AT MIKDADIAH (DIALAH). Nassir Abdul-Sahib Al-Gamali, State Board of Plant Protection, Baghdad, Iraq. Email: nassir_aljamali@yahoo.com

This study was carried out in pomegranate Orchards at Mikdadiah/Dialah during 2001 and 2002 to assess the economic importance of the number of chemical sprays by using Actelic (Pirimiphos-methyl) 50% E.c. with an average of 4 ml³/gl to control pomegranate fruit worm *Ectomyelois ceratoniae* (Lepidoptera: Pyralidae). Results indicated that increasing the number of sprays to more than four times was not economical, as there was no significant differences between the rate of infested fruits and the number of sprays from 4-8. The infestation rate was 6.9% with seven sprays, and infestation following 1, 2, 3, 4, 5, 6 sprays and the control was 22.2, 18.6, 14.57, 11.0, 9.12, 8.1 and 50.7%, respectively.

C 4

MECHANICAL CONTROL OF THE BEETLE *EUSERICA MURZKA* USING LIGHT TRAPPING. Muhamad Massud¹, Ali Ramadan². (1) Plant Protection, Tsawa Project for Improved Seeds Production, Murzuk, Fezzan, Libya; (2) Plant Protection, Faculty of Teacher's Training, Murzuk University, Sabha, Libya.

Light traps are considered as one of the best and effective methods for controlling insecticidal pests which appear in the night and are attracted to specific intensities a Light. In the past few years a new variety of insect was spotted in the South and middle regions of Libya. *Euserica murzka* (Rm, Mas) it follows the

beetles (order: Coleoptera, family: Scarabaeidae). It has two generations per year, and attacks the flowers and the leaves of a number of crops, such as alfalfa, and fruit trees such as peach, olives and zizyphus tree. Larvae feed on potato tubers and carrot roots. Immediately after sunset this insect appears in the field. Light traps of different shapes were placed in different locations with variable light intensity to attract a great number of insects. In 2003 a handy, cheap, simple light trap model, suitable to the insects nature and can easily be used by farmers and in public places was designed. 60-80 adult insects, larvae and pupae were found in one square meter. The total number of insects trapped during the period when the adult insect was at its highest activity (120 days approximately) ranged between 3,118-4,992 insects per day. The use of this trap can reduce insect population by 62.3% up to 71.3%, in one season, which is a good result if compared with other chemical control methods.

C 5

THE USE OF OZONE AGAINST STORED GRAIN PESTS. Emad Qassem, Plant Protection Department, College of Agriculture and Forestry, University of Mosul, Mousel, Iraq, Email: e_madk@maktoob.com

Biological effects of ozone have been investigated as an alternative method for grain disinfestations. Ozone at concentration of 0.07g/m³ killed adults of *Sitophilus granarius* L, *Sitophilus oryzae* L and *Rhizopertha domenicana* after 5-15 hours of exposure. Adult death of *Tribolium confusum* Duv and *Oryzaephilus surinamensis* was about 50% after 15-20 hr of exposure. Total adult death of all insect species was made with 1.45 g/m³ ozone concentration after one hour of exposure. Under the above mentioned ozone concentration, total developing stages death of *Sitophilus* spp. in hidden grain infestation took place after 5-10 h. exposition. Biological effect of ozone increased significantly with temperature increase from 10 to 35 °C. Grain moisture content from 12% to 18% did not have a significant effect on the mortality of the above mentioned rice beetles when treated by ozone.

C 6

EFFICIENCY OF TRAPS WITH ODOR BAITES FOR THE CONTROL OF PUBESCENT ROSE CHAFER, (*TROPINOTA SQUALIDA* SCOP). H.B. Homam and M.A. Mohamed, Department of Vegetable Pests, Plant Protection Institute, Dokki, Giza 12618, Egypt, Email: dr_homam@hotmail.com

Experiments were conducted to confirm and quantify earlier observation that odor-baits played a significant role in attraction of *Tropinota squalida* adults. Eight fragrance oils (rose, pink, vanillia, Arabian jasmine, mint, jasmine, apple and peach) were screened to determine the more suitable odor oil that could be used as a bait in the trap to attract *T. squalida* adults. The tested traps could be arranged in the following descending order according to their ability in capturing beetles: pink, Arabian jasmine, rose, apple, mint, jasmine, vanillia and peach. Their efficiency, expressed as daily mean of catch was 161.07, 71.00, 49.53, 24.80, 16.53, 14.80, 2.67 and 6.20 beetles/trap, respectively. Mean numbers of *T. squalida* captured by traps with pink oil baits suggested that it is the more suitable odor to attract the beetles. Traps with pink oil baits combined with hand collection can be considered as the most effective and safe method for controlling the adults of *T. squalida* in apricot trees.

C 7

MODEL DESIGN TO ESTIMATE THE ECONOMIC THRESHOLD LEVEL OF LESSER DATE MOTH *BATRACHEDRA AMYDRAULA* MEYRICKIN IN THE CENTRAL REGION OF IRAQ. R.S. Al-Jorany¹ and Khamees Abood Al-Dolimey². (1) College of Agriculture, University of Baghdad, Baghdad, Iraq, Email: redha_aljorany@yahoo.com; (2) Agriculture and Food Technology Center, Baghdad, Iraq.

The Study was conducted in date palm fields in Tarmia, Baghdad province, Iraq, during the 2003 growing season in order to estimate the economic threshold level (ETL) of lesser date moth *B. amydracula* on two cultivars (Zahdi and Khastawe) of date palm *Phoenix dactylifera* L. The damage yield function and the relationship between the number of fallen fruits as well as infested fruits and the number of larvae were calculated. A model was designed to estimate the ETL for infestation based on the number of larvae/100 fallen fruits and the percent of infested fruits. It was found to be 3 larvae /100 and one larvae/100 fallen fruits or when the rate of infestation reached 14.05% and 5.42% in Zahdi and Khastawe respectively. The damage yield function was $Y = -0.2768x + 146.45$ in Zahdi and $Y = -1.7014x + 127.58$ in Khastawe.

C 8

SOME AGRICULTURAL AND MECHANICAL WAYS TO CONTROL WHEAT STEM SAWFLY *CEPHES PYGMAENS* L. IN WHEAT FIELD IN NENEVAH PROVINCE. S.J. Jargees and Abdul-Kareem Hashem, Plant Protection Department, College of Agriculture and Forestry, Mosul University, Mosul, Iraq, E-mail: nbl_mstf@yahoo.com.

In an attempt to control the different stages of the wheat stem sawfly (*Cephes Pygmaens* L.) (Cephidae: Hymenoptera), it was found that the hot and dry weather conditions have a remarkable effect on the viability of diapaused larvae. Exposing infected plants to summer hot conditions was responsible in killing 96.6% of the diapaused larvae, compared to 70% killing for those exposed to cold conditions at 0-4°C.

C 9

CHEMICAL CONTROL FOR CODLING MOTH, *CYDIA POMONELLA* (L.) AND TIMING OF APPLICATION. I.J. Al-Jboory¹, H.F. Alrubeai² and S.O. Klaywi². (1) Agriculture Collage, Plant Protection, Baghdad University, Iraq; (2) Ministry of Science and Technology, Biological Control Center, P.O. Box 765, Baghdad, Iraq, Email: Samirabh85@yahoo.com

Field experiments to determine the best time for pesticides application to control codling moth, *Cydia pomonella* (L.) indicated that the spray of pesticides, when insects caught in the pheromone traps reached 6 insect/trap/week, which correspond to 45.85 accumulated thermal units, led to reduction in average rate of infested fruits in all treatment to 6.78% in the first generation and to 0.88% in the second generation in comparison with 30.6% and 12.5% in the control treatment, respectively. The results of insecticides efficacy in Tarmiya region, indicated that mixture of fenoxycarb and supracid had the highest efficacy in controlling codling moth. The rate of infested fruits in the first generation was 1% when applied at 6 males caught/trap/week. At Abu-Gharib region the use of these two chemicals led to a control of 96.7%.

C 10

EFFICACY OF SOME SUMMER OILS AGAINST JASMINE WHITEFLY *ALEAROCLAVA JASIMINI* ON CITRUS TREES. Hussain A. Taha, Muntaha S. Hussan, Anfal M. Ahmmad and Wafaa H. Saleh, State Board for Agriculture Research, Baghdad, Iraq, Email: hu_alani@yahoo.co.uk

The efficacy of three summer oils with different viscosities against the eggs and larvae of the whitefly *Aleuroclava jasimini* (Homoptera: Aleyrodidae) in citrus tree orchards was tested during summer 2005. Data from field trials showed that the use of the summer oil with a viscosity of 12.2 Cst produced mortality rates of 85, 47.3 and 41.1% against eggs and 69, 60 and 43.6% against larvae 3, 4 and 7 days after treatments, respectively. However, high viscosity oils (14.5 Cst) showed 75.8, 86.2 and 67.5% mortality for eggs and 71.4, 62.4 and 45.6% mortality for larva, respectively. However, low viscosity oils (6.2 Cst) produced 68.3, 44.2 and 28.3% eggs mortality and 68.2, 58.0 and 42.3% larvae mortality, 3, 4 and 7 days after treatment, respectively. These results indicated that oils with viscosity 12-14 Cst were more effective against white fly than oils with lower viscosity.

C 11

NEW METHODS FOR CONTROLLING THE PISTACHIO FRUIT WORM, *RECURVARIA PISTACHIOLA* DANIL IN MOSUL REGION. Mohammad Abdel Kareim, Plant Protection Department, College of Agriculture and Forstry, Mosul University, Iraq, Email: nbl_mstf@yahoo.com

The study was conducted in pistachio field in Hawi Al-Kanesa region of Mosul, at the beginning of May, 1995, before the larvae of *Recurvaria pistachicola* (Danil.) (Lepidoptera: Gelechiidae) moved down to the main stem of the tree for diapause. New mechanical methods were used as 5 cm ablest of cloth, atrarate and oil (Greze) and placed on the top of the main stem before the branching point. The results indicated that most of the captured larvae (87.07%) was in the second and third week of May. The belt cloth treatment was better than the other treatments. The rate of captured larvae was 60.61, 39.39 and 0.0% for the cloth, atrarate and oil treatments, respectively. The non captured larvae before treatment location was 76.06%, which cannot pass through the oil and aggregated at a 10-15 cm distance from the location of the treatment. The non captured larvae which passed the treatment of cloth belts reached 6.56% and atrarate reached 17.37%.

Generally, the rate of larvae captured before and after, treatment locations were 91.89% and 11.8%, respectively.

C 12

THE EFFECT OF MECHANICAL TREATMENTS IN LIMITING THE DISTRIBUTION OF *EXAERETOPUS TRITICI* (WILLIAMS) IN WHEAT FIELDS IN NINAWA, IRAQ. Aziz R. Al-Banna, Suad I. Abdulla and Salem J. Gargees, College of Agriculture and Forestry, Mosul University, Iraq, Email: sarmadamjad2003@yahoo.com

An investigation was carried out during 1997/1998 season in two wheat farms in Ninawa governorate, that were infested by *Exaeretopus tritici* (Williams) insect pest, to determine the effect of three plow types as a main treatment (chisel, mold board and disc plow) with four different plowing levels as a sub-treatments (one time plowing in July, two vertical plowing in July, two vertical plowing in July and August and four times vertical plowing in July and August) on the egg-sacs count. Results showed that the disc plow was significantly better in uncovering the egg-sacs in the soil and consequently controlling the insect when vertical plowing was applied twice in July.

C 13

CONTROL OF *EUPHYLLURA OLIVINA* COSTA WITH NATURAL PHENOL EXTRACTS. Yamna Ouguas¹ and Ismail Elhadrami². (1) Institut National de la Recherche Agronomique, B.P. 533, INRA, Marrakech, Morocco, Email : aminaouguas1@yahoo.fr; (2) Faculté des Sciences Semlalia, Marrakech, Morocco, Email : elhadrami@ucam.ac.ma

In this work, infestation of olive trees with the psyllid (*Euphyllura olivina*, Homoptere: Psyllidae), was assessed in the field (8 olive-tree cultivars) and was based on visual criteria. In addition the effect of phenols naturally extracted phenols on mortality of adults was evaluated. The results obtained showed that the various olive-tree varieties did not have the same degree of attack. Varieties with excessive flowering produce white cottony secretions were severely attacked by the psyllid. On the other hand, early flowering varieties did not in general attract insect, but only when trees heavily loaded with flowers and fruits. Phenols extracted from the young growths from olive-trees were used as treatment of the trees attacked by the psyllid. Two olive varieties were evaluated, a foreign variety (Arbequine) and a Moroccan variety selected from the local Moroccan olive variety (Menara). Treatment with phenol extracts showed that these compounds can cause an additional mortality (about 20%) to the natural mortality on both cultivars studied.

C 14

EVALUATION OF AL FARIS 0.25% DP. (CYPERMETHRIN) FOR THE CONTROL OF SESAME SEED BUG, *ELASMOLOMUS SORDIDUS* (FABRICIUS) "EL KAUAK" (LEYGAEIDAE: HEMIPTERA) IN THE SUDAN. El Nayer Hamid Suliman, Crop Protection, Agricultural Research Corporation, Entomology Research Section, P.O. Box 126, Wad Medani, Sudan, Email: elnayer15@yahoo.com

Sesame has been in cultivation for many years in the rainfed area as a cash crop, source of oil and ingredients for native cakes, sweet, etc. It has potential for expanded production to meet local needs and reduce oil importation. Insect pest problems have become serious as a result of extended production. This necessitates improvement in the insect pests management to obtain high yield. Sesame seed bug (Elkauak), *Elasmolomus sordidus*, is the most important to attack sesame seeds. The experiments were conducted during 2003/04 and 2004/05 seasons (at two sites), viz. Gedarif Research Station (Towawa area) and New Halfa Research Station. The performance of El Fares 0.25% DP against sesame seed bug, *Elasmolomus sordidus* during 2003/04 and 2004/05 was evaluated. The results showed that Al Faris 0.25% DP at the rate of 100 g product/m² gave good biological efficacy for the control of sesame seed bug of sesame. The mortality rate was 90% for two seasons. Thousand seeds weight was 3.1 g in both seasons at Gedarif and 3.0 g at New Halfa. Oil content was 40.2 and 40.4% in Gedarif and 40.2% in New Halfa.

C 15

COMPARISON OF THE EFFICACY OF MANY TRAPS AND ATTRACTANCE IN CATCHING OF MEDFLY ADULTS, *CERATITIS CAPITATA* WIEDE. IN SYRIA. Mageda Mofleh¹ and M.Ahmad².

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A comparison between attracting materials, and various color traps showed the followings: trimedlure products, if used separately, attract males only, but if accompanied with water or protein hydrolysate, this would attract females in addition to males, the proportion of females being always very small. Traps containing protein hydrolysate attract males and females, but the numbers was very small compared with what was attracted by trimedlure traps; the proportion of attracted females is higher than that of males. The comparison of results on the effect of trap color on the catch quantity did not express a general tendency to indicate the superiority of a definite colors in the presence of all products or the attracting materials under test. The results showed the superiority of one or more colors for one product, but the tendency was in favor of the yellow and dark green colors for the most products. A comparison between various nutritional attracting materials and pheromones has been carried out using protein hydrolysate and "Biolure" as attracting materials for both females and males, and the Pheromone "trimedlure" was used as an attracting material for males only. The above mentioned attracting materials have been used either alone or mixed inside Mc Phail's plastic traps. For trimedlure alone Jackson traps have been used.

C 16

CONTROL OF THE RED PALM WEEVIL *RHYNCHOPHORUS FERRUGINEUS* OLIV. (COLEOPTERA: CURCULIONIDAE) USING AGGREGATION PHEROMONES. Ahmad Hussien Al Saoud and Mubarak Ali Al-Qusaile Almansouri, Plant Protection Division, General Agricultural

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Red palm weevil *Rhynchophorus ferrugineus* Oliv. (Coleoptera: Curculionidae) is one of the most important insects attacking date palms in many date palm growing areas world-wide. The experiment conducted in United Arab Emirates during 2003-2004 showed that the use of aggregation pheromone traps gave good results. Traps captured large numbers of weevils and prevented the spread of infestation into new areas, helped locating infested spots, and determined insect periods of activity during the year. Such information was helpful in preparing plans and programs to control the pest and evaluating its control operations. It is known that pheromones don't cause any damage to the environment, humans and animals and using them is quite easy and inexpensive. Results showed the effectiveness of the concentrations: 200, 400 and 700 mg of the pheromone 4- Methyl-5-Nonanol 90%+ 4- Methyl- 5- Nonanone 10%. The concentrates 400 and 700 mg had significantly better catch than 200 mg. However no significant differences were observed between the other treatments and the control. The collected insects were 34, 269, 308 and 277 for the three concentrations and control respectively. The total number of collected insects was 1038 (403 males and 635 females) in one year. Red palm weevil does not enter diapause and it is found all year around. The large number of insects caught occurred in two periods during the year, the first during March-April and the second during September-October. The effectiveness of pheromone traps was found to be influenced by several factors (pheromone and its concentration, time of the year, bait, pheromone and bait changing time, presence of water in the trap, distance between every two adjacent traps, infestation severity in the farm, use of Kairomones and traps maintenance).

Beneficial Insects

BI 1

THE EFFECT OF ANISUM (*PIMPINELLA ANISUM* L.) FLOWER POLLINATION BY HONEYBEES (*APIS MELLIFERA* L.) ON YIELD AND QUALITY IMPROVEMENT. A. Khanshour and A. Alburaki, Plant Protection Department, Faculty of Agriculture, P.O. Box 30621, Damascus University, Damascus, Syria, Email: anaskhanshour@yahoo.com

This study was conducted on Anisum plants (*Pimpinella anisum* L.) in the research apiary field, at Faculty of Agriculture, Damascus University, Syria, for the purpose of studying the effects of flower pollination by honeybees (*Apis mellifera* L.) on fruit-set and consequently on the crop quantity and quality. The rate of set fruits resulted from honeybees visits (treated plants) was calculated and compared with the control, which was isolated to prevent bees from reaching it. The treated plants gave 219.5 g per 2 m² plots while the control gave 65.6 g only. The thickness of the seeds resulting from pollination with a good number of honeybees, increased remarkably compared with the control. The 100 seeds weight from honeybees pollinated plots was 0.255 g compared to 0.093 g in the control. The average amount of oil in the seed was 4.8% in treated plants and 4.2% in plants pollinated by Open-pollination, and 3.2% in the control. The statistical analysis (F-test) showed highly significant differences ($P < 0.01$) between the treatments and the control. The results of this study showed the importance of honeybees in Anisum fields and their contribution in flower pollination and improving the quality especially the seed's oil content.

BI 2

THE ROLE OF COMPLEMENTAL DIETS ON THE TOLERANCE FOR COOLING TEMPERATURE AND SOME BIOLOGICAL CHARACTERS OF HONEY BEE WORKERS. Talal Taher Mahmoud and Zahra N. Shamdin, University of Dohuk, College of Agriculture, Iraq, Email: taherm47@yahoo.com

The results showed that the highest rate of hypopharyngeal gland lobe dimensions of honey bee (*Apis mellifera*) was 171.0 μm when feeding on vitamin C. The largest dimensions of wax gland cells was 26.73 μm in length and 23.07 μm in width; and 27.14 μm in length and 22.06 μm in width when feeding on soya bean and skim milk, respectively. The highest production of wax and honey were 1817.6 gm/colony and 9.92 kg/colony in association with feeding on soya bean plus vitamin C. The workers fed with vitamin C tolerated 15 °C for 6 days, 10 °C for 7 days and at 5 °C for 5 days. Whereas those fed on soya bean remained viable for 15 days at 15 °C, for 7 days at 10 °C and for 5 days at 5 °C. The workers fed on vitamin C plus soya bean tolerated 15 °C for 15 days, 10 °C for 8 days and 5 °C for 5 days, whereas those fed on vitamin C plus skim milk remained viable for 14 days at 15 °C, for 7 days at 10 °C and for 4 days at 5 °C.

BI 3

MEDICAL USES OF THE HONEYBEE PRODUCTS: HONEY AND BEE VENOM. Abdelsalam A. Mohamed, Plant Protection Department, Faculty of Agriculture, University of Minia, El-Minia, Egypt, Email: abdo52@yahoo.com

Bee products have contributed to the health and the abundant life of mankind since prehistoric times in many cultures and they are still in use until now. The therapeutical use of bee products is called apitherapy. The ancient physicians who prescribed bee products for various ailments would have had no knowledge of the principles involved in their medical actions, and empirical knowledge was gained from their effective use. Modern physicians, however, generally require a rational explanation for their mode of action before a traditional medicine is given a serious consideration. Much has been written on this subject outside the medical professional and scientific literature. The more convincing professional reports are scattered through a very wide range of journals, and some of the explanations for medical effects of bee products are to be found in articles unrelated to honeybee. Hence, this review was undertaken to bring together the evidence that supports the use of bee products in medicine, and focus on the correlation between the properties of these products and their use and application for improving human welfare.

BI 4

EFFECT OF SOME GEOGRAPHICAL REGIONS IN THE NORTH OF IRAQ ERBIL GOVERNORAT ON THE HONEYBEE WORKERS LONGEVITY. Abdulrahim Omer Mustafa¹ and Muzahim Ayoub El-Saiegh². (1) Plant Protection Department, Erbil Directorate Agriculture, Erbil, Iraq; (2) Plant Protection Department, College of Agriculture and Forestry, Mosul, Iraq, Email: muzahimelsaiegh@yahoo.com

A study has conducted in Erbil Governorate of Iraq, in four different regions selected according to altitude: Khabat (200 m), Erbil (450 m), Dyana (740 m) and Shaqlawa (970 m) during the period from 11/10/2001 to 28/11/2002. Bee workers longevity was affected by the season and altitude. The bees which emerged in October survived longer than those emerged in May. Bees longevity was also affected by altitude.

BI 5

EFFECT OF HONEY AND PROPOLIS ON TWO DIFFERENT ISOLATES OF PROBIOTIC BACTERIA. Sara' Abu Raddad¹, Ibrahim Nazer² and Malik Haddadin³. (1) Faculty of Agriculture, University of Jordan; (2) Plant Protection Department Faculty of Agriculture, University of Jordan; (3) Nutrition Department Faculty of Agriculture, University of Jordan, Jordan, Email: sraddad@gmail.com

This study was done to evaluate the effect of three different honey samples and one sample of propolis collected locally, on the growth and viability of two isolates of probiotics bacteria (*Bifidobacterium infantis* and *Lactobacillus acidophilus*) in skimmed milk, and to test the quality of the fermented milk produced. Honey samples used were analyzed for their pH, refractive index, moisture content, ash content, and minerals available. There were three main assays conducted in this study, honey effect assay, propolis effect assay, and the mixture of honey and propolis effect assay. All the honey samples promoted the growth of *B. infantis* and *L. acidophilus*. The highest counts of *B. infantis* were 9.10, 8.86, and 9.05 log₁₀ CFU/ml at 7.5% level for the three samples, and the highest counts of *L. acidophilus* were 8.51 log₁₀ CFU/ml at 1% for honey 1, 8.81 and 8.44 log₁₀ CFU/ml at 2.5% for honey 2 and 3. For the propolis assays using *B. infantis*, the control had the highest counts compared with the other concentrations added. On the other hand, propolis level 16% had the best effect on *L. acidophilus* growth. The mixture of honey and propolis promoted the growth of *B. infantis* and *L. acidophilus* compared with the control. The fermented milk produced was tested for its short chain fatty acids availability, pH, titratable acidity, and antimicrobial effect against three pathogenic bacteria. Short chain fatty acids were produced in relatively high amounts compared to the control. Based on the results obtained, we can emphasize the use of honey and propolis as prebiotic, for its positive effect on the growth and viability of probiotic bacteria, in addition to its health promoting properties.

BI 6

ROLE OF SOCIAL AND SOLITARY WILD BEES AS PLANT POLLINATORS AND THEIR DIVERSITY IN FEW LOCATIONS IN NORTH ALGERIA. Leila Bendifallah-Tazerouti¹, Kamel Laouadi² and Salah Eddine Doumandji³. (1) Biology Department, Faculty of Sciences, M'hamed Bougara University Boumerdes, 67 avenue of 1st November, Rouiba, Algiers, Algeria, Email: bendif_l@yahoo.fr; (2) Entomology Laboratory, Sciences Mentouri University, Constantine, Algeria; (3) National Institut of Agronomy, El Harrach, Algiers, Algeria.

The present study was conducted on social solitary wild bees during three years (2003 to 2005) in different locations in the North of Algeria (oriental Mitidja, Boumerdes and Bouira). The survey indicated the occurrence of 107 species in 14 genera and 5 families. A number of species and sub-species were identified for the first time, such as *Anthophora atriceps* Perez, 1879 and *Lasioglossum (Lasioglossum) discum* Smith, 1853 sub-species *aegyptiellum*. The diversity of wild bees was investigated. The study of wild bees as plant pollinators showed that the solitary wild bees have a more important role in pollinating plants than honey bees *Apis mellifera*.

BI 7

STUDY OF THE CLIMATIC FACTORS ON THE WILD BEES AND HONEY BEES ACTIVITY AT THE MITIDJA AREA. Leila Bendifallah-Tazerouti¹, Kamel Laouadi² and Salah Eddine Doumandji³.

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The effect of the temperature and the relative humidity on wild bees and honey bees activity during the year 2003 was investigated at the experimental station of National Institut of Agronomy, El Harrach, Algiers. The results showed that the activity of these insects was positively correlated with temperature and negatively with relative humidity. This study focused on the following species: *Apis mellifera*, *Bombus terrestris* (Apidae), *Andrena flavipes* (Andrenidae), *Lasioglossum discum* (Halictida), *Anthophora atriceps* (Anthophoridae) and *Osmia* sp. (Megachilidae).

BI 8

THE EFFECT OF ARTIFICIAL DIET ON THE ACTIVITY OF THE ITALIAN HONEY BEES *APIS MEELLIFERA* LIGUSTICA IN TRIPOLI, LIBYA. Salah Enbaia¹, Soliman Abosaiif² and Al-Hashmi Eglao². (1) Plant Protection Department, University of Al-Fateh, Tripoli, Libya; (2) Plant Protection Department, Omar Al-Mukhtar University, El-Beida, Libya, Email: najla_elzaidi@yahoo.ca

Experiments were conducted to test the effect of two types of artificial diet (local paste and German paste) on the activity of pollen grains, brood area, colony weight, and bee population density. Artificial diets were represented by local and German pastes which were compared to the control treatment that contained no artificial diet at all. Experiments were conducted during winter and summer seasons. Fifteen colonies were used for the above mentioned treatment; five colonies were assigned for each of the three treatments including the control. Results indicated that the average areas of pollen grains were 8.12, 8.29, and 6.45 cm² for local paste, German paste, and the control treatment, respectively. Brood areas were 258, 257.88, and 225.68 cm² for the three treatments, respectively. Colony weights were 32.12, 32.25, and 30.4 Kg, respectively. The average numbers of frames full of bees for same treatments were 4.0, 4.0, and 3.43, respectively. Statistical analysis indicated that difference between both artificial diets and the control were significant, but difference between the two artificial diets were non significant. This confirms the importance of artificial diet for bee nutrition.

BI 9

THE STUDY OF INHIBITORY EFFECT OF PROPOLIS ON SOME GRAM POSITIVE AND GRAM NEGATIVE BACTERIA. Mahmood Abd-Aljabar Altobje, Department of Biology, College of Science, University of Mosul, Mousel, Iraq, Email: altobje@yahoo.com

The inhibitory effect of propolis produced by honeybees was determined for some Gr+ (*Staphylococcus*, *Streptococcus*, *Enterococcus*,) and some Gr- bacteria (*Escherichia coli*, *Klebsiella*, *Salmonella*, *Proteus*, *Pseudomonas*). The inhibition was particularly evident on, Staph, Strept and Kleb. The minimal inhibitory concentration (MIC) of propolis on these three bacteria was determined. These were ($\mu\text{g}/\text{disc}$) 2.5 mg for *Staphylococcus aureus*, 0.25 mg for Kleb and Strept.

BI 10

POPULATION DYNAMICS OF THE VARROA MITE (*VARROA DESTRUCTOR*) ON THE SYRIAN HONEYBEE. Nouraldin Yossef Daher Hjjj¹ and Ali Alburaki, (1) General Commission for Scientific Agricultural Research (GCASR), P.O. Box 113, Damascus, Syria, Email: nouraldinz@yahoo.com; (2) Plant Protection Department, Faculty of Agriculture, P.O. Box 30621, Damascus University, Damascus, Syria, Email: ali-alb@scs-net.org

Varroa mite *Varroa Jacobsoni* Oud. (*Varroa destructor* Anderson and Trueman, 2000) is the most important pest for apiculture. This study was conducted in the Apiary of Honeybee of the Scientific Research Laboratory at the Faculty of Agriculture, Damascus University (Syria) from 2000 to 2002. Population dynamics of the varroa mite during spring and autumn on the Syrian honeybee under Damascus city conditions, and suitable period to control varroa mite were evaluated. In spring, the reproduction of varroa population increased. There was a difference in the average daily drop for each colony from one

period to another. In autumn, the average varroa reproduction started to increase from the end of September. The varroa population increased during November and December according to the prevailing environmental conditions.

BI 11

NUTRITIVE EFFECTS OF MULBERRY LEAVES ENRICHMENT WITH RIBOFLAVIN VITAMIN ON BIO-ECONOMIC CHARACTERS OF SILKWORM, *BOMBYX MORI* L. Roholla Rajabi¹, Rahim Ebadi¹, Mohammad Fazilati², Seyed Ziaaldin Mir Hoseini³. (1) Plant Protection Department, Isfahan University of Technology, Isfahan, Iran; (2) Food Science Department, Isfahan University of Technology, Isfahan, Iran; (3) Animal Science Department, College of Agriculture, Guilan University, Rasht, Iran, Email: r_r_iut_msc@yahoo.com

The present investigation deals with the effects of riboflavin oral supplementation on the growth and cocoon characters of the silkworm, *Bombyx mori* L. (Lepidoptera: Bombycidae). Silkworm larvae were fed on fresh mulberry leaves of shin inches nevisse enriched with riboflavin, once a day. Leaves were soaked in prepared solutions for 15 min and dried in air flow then fed to silkworm larvae from first to the end of third instar. Fourth and fifth instar larvae were fed with leaves sprayed with each concentration. Normal leaves without soaking in or spraying with water were used as control treatment. All biological and economic parameters were measured by using standard techniques in sericulture. Male and female cocoon weights were greatest in 77 ppm (1.195 g) and 127 ppm (1.622 g), respectively. Also, male and female pupal weights were recorded as maximum in 37 ppm (0.895 g) and 127 ppm (1.169 g), respectively. Male and female shell weights had significant increase in 77 ppm with 0.311 and 0.318 g compared to control (0.276 and 0.277 g). Male and female shell ratio % had maximum amount in 77 ppm treatment which was 26.06% and 21.46%, respectively. From the above results, it may be concluded that enrichment of mulberry leaves with riboflavin can be used at 77 ppm concentration for enhancing the economic characters of silkworm.

Rodents and Birds

RO 1

ECOLOGICAL STUDIES ON THE MOLE RAT, *SPALAX EHERNBERGI* (SPALACIDAE: RODENTIA) AT EL-GABAL EL-AKHDER AREA, LIBYA. Magdy Wilson¹, Hasan El-Deeb¹, Tala'at Awad² and Hawaa Mohamed³. (1) Plant Protection Research Institute, Cairo, Egypt, Email: magdy_wilson2000@yahoo.com; (2) College of Graduate Studies, Nile Valley University, Sudan; (3) Faculty of Agriculture, Omar Al-Mukhtar University, El-Beida, Libya.

A series of field experiments were conducted under different ecosystems representing El-Gabal El-Akhder habitat. Some of these experiments were conducted for studying some ecological aspects connected with the mole-rat *Spalax ehrenbergi* which is considered as the main rodent pest in different agrosystems of El-Gabal El-Akhder area. The ecological studies showed that mole-rat digged subterranean tunnels which were branched to form different types of chambers (food storage, sanitary and nesting chambers). Subterranean tunnels extended noticeably for a considerable distance and varied according to the agrosystem properties as its length ranged between 22.8 m to 64.3 m in the different studied areas. Fruit orchards and field crops land have the upper hand in mounds harborage as numbers of mounds recorded were 14 and 12 mounds/burrow, respectively, while only 9 and 10 mounds/burrow were counted in forest and waste lands, respectively. The numbers and shapes of the active burrows differed considerably according to the types of agrosystems. Potato tubers, onion bulbs, wheat, barley, maize grains and olive fruits were found in rat burrows. Under field crop lands, mole-rats harbored potato tubers, onion bulbs, wheat, barley, maize grains and olive fruits, whereas in forest land the mole-rats harbored potato tubers onion bulbs, plant roots and barley grains. The inspection of burrows in wastelands revealed the presence of olive fruits, barley, wheat, onion bulbs, fig fruits and potato tubers.

RO 2

HISTOPATHOLOGICAL CHANGES IN ALBINO RATS DUE TO CHLORPYRIFOS TREATMENT. Ibrahim S. H. El-Durssi¹, Ifdial O.S. El-Awami², Ghyath S. Mahmoud³ and Fahim A. Benkhaial⁴. (1) Zoology Department, Faculty of Art and Science of Marj, Garyounis University, Libya; (2) Faculty of Agriculture, Omar El-Mukhtar University; (3) Faculty of Veterinary Medicine, Omar El-Mukhtar University; (4) Department of Food Technology, Faculty of Agriculture, Omar El-Mukhtar University, Al-Beida, Libya, Email: ghariani99@yahoo.com

This study was performed to investigate the effect of Chlorpyrifos, one of the most used insecticides, on certain rate organs. 110 males of the Albino strain of the Norway rat (*Rattus norvegicus*) were used. The experimental animals were divided into four groups: the first group was used to determine the median lethal dose (LD₅₀) which appeared to be 81.2 mg/Kg body weight. The second group was treated on daily bases by multi oral doses of 1/10 of LD₅₀. The third and fourth groups were treated by a single oral dose of 1/10 LD₅₀ and 1/30 LD₅₀, respectively. Histopathological findings of the liver revealed a hypertrophy of liver cells with stenosis of the sinusoids, congestion of the blood vessels, necrosis and hemorrhagic spots on the sub capsular spaces. Some hepatic lesions showed fatty changes and liver cirrhosis. The pulmonary lesions were characterized by pulmonary emphysema and hemorrhage with the presence of hyaline casts in their alveoli. The spleen showed congestion, lymphoid depletion and necrosis. The heart showed hypertrophy of its muscle fibers with the presence of petechiation on the subendocardial and subepicardial spaces, with lymphocytic infiltrations. Sections from the intestine showed hemorrhagic enteritis and slaughting of its epithelial mucosae. Most of the renal and testicular sections revealed congestion, exudation and necrosis of their tissues with presences of hyaline casts in the renal tubules. Sections from the brain showed congestion, exudation, lymphocytic infiltration and necrosis of Purkinje's cells, although encephalitis and meningitis were dominant in most animals.

RO 3

FIELD PERFORMANCE OF THREE RODENTICIDES IN CONTROLLING THE LIBYAN JIRD *MERIONES LIBYCUS* IN SYRIA. Ibrahim Mamkhair¹, Fauzi Samara² and Adwan Shehab¹. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P. O. Box 113, Damascus, Syria, Email: mamkher@hotmail.com; (2) Department of Plant Protection, Faculty of Agriculture, Damascus University, P.O. Box 30621, Damascus, Syria.

Field trials were conducted to evaluate the field performance of three rodenticides (Zinc Phosphide, Brodifacoum and Aluminum Phosphide) in controlling colonies of the Libyan Jird *Meriones libycus* at semi arid lands east of Damascus and Homs cities during February 2005. Rodenticides were applied in the form of 2% zinc phosphide wheat baits, Brodifacoum (0.005%) ready to use baits, and aluminum phosphide tablets (56% a.i.). The active burrows were treated by inserting ten grams of the poisoned baits of each Zinc Phosphide and Brodifacoum or by one tablet (3 g) of Aluminum Phosphide. The efficacy of treatments was calculated depending on the number of active burrows before and after treatment. The data obtained indicated reduction in burrowing activity in zinc phosphide, brodifacoum, aluminum phosphide treatments, at 95.9, 91.9 and 81.9%, respectively, in comparison to 18.5% in the untreated control. The difference between zinc phosphide and aluminum phosphide efficacy was not significant, while it was significant between these two rodenticides and brodifacoum. Symptoms of direct poisoning were observed on mammalian predators in the study area 24 hours after zinc phosphide treatment, which indicate serious damage to the non-target species of rodents' natural enemies, in spite of the high potency of this acute rodenticide. The results suggested that inserting one gram only of zinc phosphide baits in each active burrow, seems to be adequate to achieve high rate of efficacy against the Libyan Jird in comparison to the efficacy achieved when 10 grams were inserted.

RO 4

THE TERATOGENIC EFFECTS OF CHLORPYRIFOS ON WHITE RATS. Ifdial Omer El-Awami and Zainab Mukhtar, Plant protection Department, Faculty of Agriculture, Omar Al-Mukhtar University, P.O. Box 919, Al-Beida, Libya, Email: ghariani99@yahoo.com

This study aimed to investigate the teratogenic effects of the organophosphorus insecticide Chlorpyrifos "Dursban" on white rats. Only females of Albino strain of the Norway rat (*Rattus norvegicus*) were used. To study the teratogenic effects of dursban, pregnant rats were orally treated with the insecticide in two doses: 1.0 mg/kg (NOEL) and 7.1 mg/kg (1/10 LD₅₀) during 6-15 days of pregnancy (20 females/dose). On the 21st day of pregnancy, the treated and control females were killed and their uteri were dissected for morphological examination. The results showed that the LD₅₀ of Dursban for Albino rat females was 70.7 mg/kg. In the teratogenicity experiment, no toxic symptoms or decrease in vitality or activity of treated females was observed. Morphological examination revealed marked effects in the treated groups in the form of increased rate of implantation sites. The fetuses in the high-dose group showed complete autolysis. Significant weight loss was observed for all fetuses of treated females in contrast to untreated females. Visceral examination for fetuses showed several abnormalities in the internal organs; dilatation in the third ventricle of the brain, wide nostrils, reduction in the eyes' orbits. Hypoplasia of the lungs was also observed at the low-dose and in the high-dose, hypertrophy of the heart and emaciation of the liver for the low and high doses respectively and dilatation of the renal pelvis. On the other hand, no visceral malformations were observed on the fetuses of the control group.

RO 5

PRELIMINARY SURVEY FOR BAT FAUNA OF SYRIA. Adwan H. Shehab¹ and Ibrahim H. Mamkhair¹. (1) Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P.O. Box 113, Damascus, Syria, Email: a.shehab@mail.sy

A field survey was conducted during 2004/2005 to reinvestigate the bat fauna of Syria. The results were based on live bat specimens collected from different localities; caves, ruins and abandoned buildings, also cranial remains of bats recovered from owl pellets were used. 16 species of bats were recorded: The Greater horseshoe bat (*Rhinolophus ferrumequinum*), the Mediterranean horseshoe bat (*Rhinolophus euryale*), the lesser horseshoe bat (*Rhinolophus hipposideros*), Peter's horseshoe bat (*Rhinolophus blasii*), Schreiber's Long-winged bat (*Miniopterus schreibersii*), the gray long-eared bat (*Plecotus austriacus*), the

greater mouse-eared bat (*Myotis myotis*), the lesser mouse-tailed bat (*Myotis blythii*), the long-fingered bat (*Myotis capaccinii*), Geoffroy's bat (*Myotis emarginatus*), the trident leaf-nosed bat (*Asellia tridens*), Hemprich's long-eared bat (*Otonycteris hemprichii*), Kuhl's pipistrelle bat (*Pipistrellus kuhlii*), the naked-bellied bat (*Taphozous nudiventris*), Botta's serotine bat (*Eptesicus bottae*) and the Egyptian fruit bat (*Rousettus aegyptiacus*). Two species were recorded for the first time from Syria. Except for the Egyptian fruit bat, all the recorded bats from Syria are insectivores and considered as important natural enemies for insects pests.

RO 6

FOOD PREFERENCE AND FEEDING BEHAVIOR OF THE EGYPTIAN FRUIT BAT (*ROUSETTUS AEGYPTIACUS*) UNDER LABORATORY CONDITIONS. Hasan El-Deeb and Majdi Wilson, Plant Protection Research Institute, ARC, Egypt, Email: magdy_wilson2000@yahoo.com

Food preference and daily consumption for 15 food materials by the Egyptian fruit bat, *Rousettus aegyptiacus* were studied under Laboratory conditions using non choice and free choice methods. Under non-choice method, tomato, guava and fig fruits were the most preferred by the Egyptian fruit bat, while runner bean, squash and pomegranate were the lowest. When these food materials were tested by free choice methods, guava fruits were the most preferred followed by fig, grape and apple fruits. Mango, black dates and red dates were moderately accepted. Tomato fruits were the most preferable vegetable when offered to bats with the other vegetable fruits, while others were weakly accepted. This means that the Egyptian fruit bat may attack different types of vegetable crops and fruit trees causing different damage levels based on the plant species.

RO 7

DAILY DISTRIBUTION DENSITY OF THE HYBRID SPARROW, *PASSER DOMESTICUS* X *PASSER HISPANIOLENSIS* IN THE FIELDS OF DURUM WHEAT. Nassima Behidj-Benyounes¹ and Salah-Eddine Doumandji². (1) Dep. de biologie, faculté des sciences, université de Boumerdès, Email: behidj_nassima@yahoo.fr; (2) Lab. Ornithologie, Department of Zoology, National Institute of Agronomy, El-Harrach, Algeria.

The present study shows the daily distribution of the hybrid sparrow (House Sparrow X Spanish Sparrow) in four fields of durum wheat (*Triticum durum*) during April and May which corresponds to the maturation of durum wheat seeds. The average number of the hybrid sparrows' attacked the four wheat fields during April were 45.6, 42.3, 16.6 and 8.3 birds, respectively. The fluctuation was higher during May, where the average number of hybrid sparrow in the four fields reached 80.2, 49.8, 38.3 and 17 birds, respectively. The average daily number of hybrid sparrows counted in the morning was less than that counted in the afternoon.

RO 8

IDENTIFYING INJURIOUS BIRDS ATTACKING SUNFLOWER IN IRAN AND EVALUATING RATES AND ASPECTS OF DAMAGE. Abolghasem Khaleghizadeh¹, Soleiman. Khormali², Abdolali Espahbodi³, Esmail Alizadeh⁴ and Amirhossein. Koucheh-Baghi⁵. (1) Ornithology Laboratory, Agricultural Zoology Research Department, Plant Pests and Diseases Research Institute, Tehran, Iran, Email: akhaleghizadeh@yahoo.com; (2) Agricultural Research Centers of West Azarbaijan; (3) Golestan; (4) Mazandaran; (5) Qom, Iran.

Birds are important pests facing sunflower plantation in Iran. This survey was conducted during 2002-2003 in different parts of Iran; Mazandaran, Golestan, Tehran, Qom and Khoy. On the basis of feeding behavior of birds, eight species were attacking ripe seeds of sunflower heads. These eight injurious bird species belonging to four families: Columbidae represented by the Rock Dove (*Columba livia*) mainly in Karaj and Qom, the Turtle Dove (*Streptopelia turtur*) mainly in Gonbad; Fringillidae represented by the European Goldfinch (*Carduelis carduelis*) mainly in Golidagh and the Common Rosefinch (*Carduelis erythrinus*) mainly in Firouzkouh; Passeridae was represented by the House Sparrow (*Passer domesticus*) mainly in Karaj, Qom, Khoy, Gonbad and Mazandaran; Corvidae was represented by the Magpie (*Pica pica*) mainly in Karaj, the Rook (*Corvus frugilegus*) in Karaj and Khoy and the Hooded Crow (*Corvus corone*) in Karaj region. In this study, 2936 heads of sunflower were randomly selected and damage rate

were estimated both in farmers fields and agriculture research stations. In farm fields, the damage was low (0.98% to 3.62%), while in research fields was high (43.5% at Karaj and 24.6% at Khoy). Morphometric measurements were consisted of head height from ground surface (cm), head diameter (cm), sterile to head diameter ratio (%), head shape, form of stem and head angle. These factors were analyzed with bird damage rate. Pearson correlation was used for the first 3 factors and ANOVA for the second 3 factors. Pearson correlation was significant only for the sterile ($P<0.01$). ANOVA showed significant differences between the groups of head angle ($P<0.01$) and head shape and stem form ($P<0.05$). According to the results, low sterile, concave and flat shapes, stem with no angle and head angles 16-25° were preferred traits to select sunflower heads in sunflower programs.

RO 9

RESISTANCE OF SUNFLOWER VARIETIES TO BIRD DAMAGE IN IRAN. Abolghasem, Y. Khaleghizadeh¹ and Esmail Alizadeh². (1) Ornithology Laboratory, Agricultural Zoology Res. Dep., Plant Pests and Diseases Research Institute, Tehran, Iran; (2) Agricultural Research Center of West Azarbaijan, Khoy Agricultural Research Station, Iran, Email: akhaleghizadeh@yahoo.com

A field survey was conducted during 2003-2004 in agriculture research stations of Karaj, Tehran province and Khoy, West Azarbaijan province to evaluate the resistance of different varieties of Sunflower to damage caused by birds. 1309 heads of sunflower were randomly selected and damage rate were estimated. Mean damage rate in Karaj was 45.3% ($n=1039$), while in Khoy 21.03% ($n=270$). In Karaj, the variety Zarghan was sensitive (82.75%), while the variety CMS19 showed high resistance (2.1%). In Khoy, the variety Sor was sensitive (65.1%) and Eroflora showed high resistance (0.2%). In Karaj, early maturing varieties had more damage rate 51.29 ± 39.98 ($n=300$) than late maturing varieties 41.64 ± 38.44 ($n=719$). Morphometric measurements consisted of head height from ground surface (cm), head diameter (cm), sterile area to head diameter ratio (%), head angle, head shape and form of stem, which were analyzed with bird damage rate. Pearson correlation was used for the first four factors and ANOVA for the two other factors. Pearson correlation was significant only for head height from ground surface in Azargol, Esfahan, CMS522/2 and Alstar varieties, head diameter in Zaria, CMS522/2 and Record varieties; sterile area to head diameter ratio in Zarghan, 106, Esfahan, Armavirski and Zaria varieties; head angle in Mehr, 106, 308, 407, Shahroud, CMS1052 and Alstar varieties ($P<0.05$). ANOVA showed significant differences between the groups of head shape in Azargol and Armavirsk.

RO 10

SEASONAL FLUCTUATION OF CERTAIN TERRESTRIAL SNAIL POPULATIONS AND CHEMICAL CONTROL IN GRAPE ORCHARDS IN EGYPT. El-Sayed H. Eshra¹, Sayed A. Maontasser², Medhat M. Ahmed² and Hassan I. El-Deeb¹. (1) Harmful Animal Department, Plant Protection Research Institute, ARC, Egypt; (2) Agric. Zool. and Nemat. Department, Faculty of Agriculture, Al-Azhar University, Egypt, Email: eheshra@yahoo.com

Field experiments were conducted in some agricultural regions of Egypt to survey and control the terrestrial snails. The results showed that the highest infestations were recorded in Abbis region by *Theba pisana* as dominant snail with a ratio of 37%, while the ratio was 43% in El- Mammoura region at Alexandria governorate. At Behera Governorate, Kafr El- Dwar district was greatly infested followed by El-Dalanjat district where *T. pisana* and *Eobania vermiculata* were the most dominant snails. The seasonal fluctuation indicated that the highest populations were recorded for *E. vermiculata* and *T. pisana* during May and June respectively, while *Helicella vestalis* and *Cochlicella acuta* during August. Average number of snails ranged between 108 and 280 snail/tree in grape orchards at Alexandria, while in El-Beheira Governorate it ranged between 80 and 107 snails/tree. Toxicity of certain pesticides; methomyl, thiodicarb, aldicarb, metaldehyde and abamectin in baits was evaluated. The molluscicidal efficiency against *E. vermiculata* could be arranged in the following decreasing order: methomyl, aldicarb, metaldehyde, thiodicarb and abamectin, where the mortality ranged between 83.6 and 23%. Moreover the molluscicidal efficiency against *T. pisana* snail could be arranged in the following decreasing order: aldicarb, methomyl, metaldehyde, thiodicarb and abamectin, where the mortality ranged between 83.4 and 20.5%.

RO 11

SURVEY AND CONTROL OF THE TERRESTRIAL SNAILS USING CERTAIN PESTICIDES AND UREA. Mohamed Saeed El-Shhaat, Plant Protection Research Station, Agriculture Research Center, Alexandria, Egypt, Email: ayten999@yahoo.com, profelshahaat@yahoo.com

The terrestrial snails are considered as serious agricultural pests in Egypt. This study was carried out to survey these pests in different crops and to evaluate the efficacy of some chemicals for controlling them. The results indicated that the Brown Garden Snail *Eobania vermiculata* is the most abundant snail in fruit orchards, but *Monacha obstrcta* is the most common snail which invades berseem clover, while the small garden snail *Theba pisana* and the white sand snail *Helicella vestalis* are highly distributed in vegetable and ornamental plantations. Oxime carbamate baits of 2% a.i. were highly effective as molluscicide while baits of Confidor Imidachlopride, Kimazed Carbandazim, Rugby Cadusafos, Dipterex Trichlorform, Rock (B.t), Kocide (5% Cu) and Acrobat Copper pesticides gave lower mortality rates between 7.0% and 55%. Moreover, urea solution (10% and 15%) gave 90% and 100.0% mortality rate when they were sprayed on fruit stems during the snails active periods (winter-spring months). The urea solution (10%) caused a complete snails mortality (100%) when mixed with Carbandazim (0.2%) and aluminum potassium alum (2.5%).

General Topics

GT 1

INTEGRATED PEST MANAGEMENT IN THE CEREAL/FOOD LEGUME CROPPING SYSTEM USING A FARMER PARTICIPATORY APPROACH IN MOROCCO. Saadia Lhaloui¹, Rachid Dahan¹, Hassan Ouabbou¹, Driss Hadarbach¹, Fouad Abbad¹, Hamida Hilali¹, Hamid Ramdani¹, Cherif Ismaili¹, Mustapha El-Bouhssini² and Amor Yahyaoui². (1) INRA-CRRA Settlat, P.O. Box 589, Settlat, Morocco; (2) ICARDA, P.O. Box 5466, Aleppo, Syria, Email: slhaloui@yahoo.com

The economy of Morocco is based mainly on agriculture. Cereals and food legumes are the major crops of the country, and occupy about 70% of the arable land. However, diseases, insects and weeds are major production limiting factors and damage inflicted is around 30% yearly and may reach 100% in cases of heavy attacks. To protect these crops against their pests, INRA-Morocco and ICARDA have been conducting an IPM program to reduce the use of agricultural chemicals and facilitate sustainable, environment-friendly management practices, with a farmer participatory approach on wheat and winter chickpea. IPM Pilot Sites were established in major regions where rain fed wheat and chickpea are the most important crops. Wheat production faces a major pest problem, the Hessian fly. The major pest problem for chickpea is the fungal disease *Ascochyta* blight. In each community three lead farmers were selected to test IPM options for wheat and chickpea. Through consultation meetings prior to planting, it was agreed that the IPM options for wheat will center around (i) Hessian fly control, (ii) weed control, (iii) appropriate fertilization, (iv) and planting date. As for chickpea, the IPM options centered around (i) improved chickpea variety, (ii) weed control, (iii) use of drill for planting, and (iv) planting date. The results showed that there were significant gains in grain yield between Hessian fly resistant and susceptible wheat cultivars; and between early and late planting dates, up to 100% increase. The use of resistant cultivars gave a yield increase of two fold over the susceptible one at the early planting date, while it was up to three fold for the late planting date. In chickpea, using the best IPM options improved yield significantly. Major gains came out from winter planting and early weed control compared to traditional spring planting. Advancing sowing date from spring to winter using adapted chickpea variety with optimum package increased yields from 2 to 4-fold. On the other hand, pre-emergence herbicide application significantly improved yields. Yields increase ranged from 20 to over 100%. This emphasizes early weed control as a principal component of winter chickpea technology. The lead farmers sites were used as training sites for neighboring farmers throughout the growing season. These sites were visited by a large number of farmers (over 500), and several decision makers including newspapers reporters, and reporters from the two TV channels of Morocco. Meeting with farmers and extension agents were organized through the season and after harvest to discuss the results obtained from the year's exercise and agree on a plan of work for the coming season.

GT 2

INTEGRATED PEST MANAGEMENT THROUGH FARMER FIELD SCHOOLS – A NEW EXTENSION APPROACH IN JORDAN. Ashraf Hawamdeh¹, Alfredo Impiglia² and Zakaria Musallam³. (1) IPM Project, Ministry of Agriculture, Amman, Jordan; (2) FAO, P.O. Box 10709, Damascus, Syria; (3) Ministry of Agriculture, Amman, Jordan, Email: zak682001@yahoo.com

A Farmer Field School (FFS) is a season-long training program conducted in the field with farmers and for farmers. The activities follow the different development stages of the crop and the related crop and pest management practices. FFS is always a learner-centered and participatory approach which relies on an experimental field learning system. In general, FFS proved to be success full in less developed rural communities, and pay attention to gender issues. IPM/FFS is a very useful tool to validate and adapt the plant protection research outcomes directly with farmers through practical field testing. IPM/FFS compares the IPM strategy applied with conventional practice for local field problems. IPM/FFS was introduced in Jordan as main activity component of the Regional Integrated Pest Management Programme in the Near East Project funded by the Italian Government and implemented through the Food and Agriculture Organization (FAO) of the United Nations. IPM/FFS has been first implemented in Jordan in the year 2004 with 7 schools in the Upland, DerAllah and Ghor el Safi. Because of the positive response of the farmers attending the FFS, the Project implemented in the second year 24 FFSs in the same areas. In brief, the main achievements of the IPM/FFS component in Jordan were: 1) proper implementation of soil bio-fumigation and solarization instead of methyl bromide, 2) insect (pest and beneficials) scouting and identification, 3) crop and pest

monitoring, 4) farmer confidence to be the decision maker in his own field. 5) agro-ecosystem analysis was decision tool instead of ETLs. 6) use of pesticides only when necessary, and 7) integrated crop management.

GT 3

INTEGRATED PRODUCTION AND PROTECTION MANAGEMENT IN PADDY RICE FIELDS THROUGH FARMER FIELD SCHOOL (FFS) IN CASPIAN COAST. Hossein Heidari¹, Mohammad Sharifi² and Fatemeh Mirzaee². (1) Plant Pests and Diseases Research Institute, P.O. Box 19395-1454, Tehran, Iran, Email: hheidari_2000@yahoo.com; (2) Institute for Green Rural Advancement, P.O. Box 19835-115, Tehran, Iran.

Rice is a staple crop in Iran, planted in about 600,000 ha, mainly in the Caspian coastal region. The main pest in Iranian paddy fields is the stem borer, which was introduced to the country in 1970. Due to unsustainable approaches prevailed in the past, these fields, which are located in the environmentally critical area of the Caspian Sea, underwent heavy chemical treatment. As part of recent attempts to introduce alternative pest management methods to the region, a participatory IPM/FFS project was conducted in Fereydoonkenar Township, where the rice farmers were organized into 15-25 member working groups to exercise various elements of IPM/FFS on their fields. As a result of the project, there was a significant (80-100%) reduction in pesticides use, while the yields even increased by 17-25%. The farmers found, through participatory research, alternative transplantation strategies, such as single transplantation, which proved to be much more effective than the conventional multiple transplants in controlling blast, the use of ducks and fish to control azolla, and better strategies for seed preparation. Reliable pesticide residue tests on the rice produced from these IPM/FFS fields showed that, with 0.005 ppm, the Diazinon residue in these farms was ten times less than that of other farms. The participating rice fields are approaching the requirements of organic production (three years since the initiation of the project). The project finished in 2005 but the farmers continued the activity of FFS groups, and there is an increasing interest among the neighboring farmers to join.

GT 4

INTEGRATED PEST MANAGEMENT THROUGH FARMER FIELD SCHOOL IN CUCUMBER GREENHOUSES IN IRAN. Hossein Heidari¹, Mohammad Sharifi² and Fatemeh Mirzaee². (1) Plant Pests & Diseases Research Institute, P.O. Box 19395-1454, Tehran, Iran; (2) Institute for Green Rural Advancement (IGRA), P.O. Box 19835-115, Tehran, Iran, Email: hheidari_2000@yahoo.com

The Regional IPM in the six countries of the Near East under GTFS/REM/070/ITA project was implemented from 2004-06 on different horticultural crops, including grapes and protected cucumber in Iran. The area and production of protected cucumber has been rapidly increasing in Iran over the last few years, and likewise the various problems of pests and diseases associated with it. In some of the greenhouses, the crop is sprayed up to 30 times per seasons, which causes serious risks to the health and environment. For the first time in the country, the participatory IPM/FF approach was used to introduce alternative pest management solutions in protected cucumber in Jirouft (Kerman) and Varamin (Tehran). As a result of the activity, the use of pesticides was reduced by 80 percent, as the farmers learned, through participatory ecosystem analysis, that the greater part of spraying was totally unnecessary and ineffective. Several alternative methods, such as the use of pepper, soda, tobacco juice, *Salsola*, *Chenopodium* and other local plants, sticky yellow trap and crop traps, were successfully tested by the farmers and incorporated into their routine plant protection practices. By the reduction of pesticides, which constituted 30 percent of the total costs of production in the project area, the participating farmers also gained higher competitive advantage over other producers.

GT 5

HARMONIZING THE QUARANTINE REGULATIONS IN THE ARAB COUNTRIES. Siham Asaad, Zewdie Bishaw and Khaled Makkouk, International Center for Agricultural Research in the Dry Areas (ICARDA), P.O. Box. 5466, Aleppo, Syria, Email: s.asaad@cgiar.org

In recent years, the extent of regional and international seed exchange is increasing significantly in terms of numbers and volumes. The movement of plants and plants product across international boundaries serve as potential carriers of pests and there is a risk for introducing harmful pests to areas where they did

not occur before. However, such measures are also used by some countries as non-tariff trade barriers hampering international trade particularly in seed imports and exports. The World Trade Organization (WTO) Sanitary and Phytosanitary Measures (SPS) and the FAO's International Convention on Plant Protection (IPPC) requires member countries to ensure that their measures are based on scientific grounds, either through undertaking an evaluation of the risks involved or, preferably, by using internationally-developed sanitary and phytosanitary standards. In many developed countries the quarantine regulations (QR) and protection against quarantine pests (QP) are well established at the national level. Moreover, many developing countries are also aiming at harmonizing their national seed policies and regulatory frameworks, including QR, phytosanitary standards and requirements at the regional level. Some examples include, the Central American countries, the East African Economic Community under the auspices of the Association of Agricultural Research in Eastern and Central Africa (ASARECA) and the five South East Asian countries under Asia and Pacific Seed Association have revised their quarantine pests and harmonized procedures for facilitating seed import/export procedures. However, in most countries of the Near East and North Africa region the QR require further development, as they did not reach to the desired international level. The Arab countries are required to develop or update their OR at the regional level. This paper discusses the need for harmonizing the quarantine regulations at the regional level among the Arab and neighboring countries by reviewing: (i) the existing QR regulations and procedures, (ii) the quarantine pest and pest risk analysis to evaluate biological or otherwise scientific and economic evidence to determine whether a pest should be regulated (iii) administrative and technical constraints to be addressed in the harmonization process, and (iv) develop a regional data-base to review plant protection needs including quarantine issues. The establishment of the Near East Plant Protection Organization (NEPPO) will be an effective facilitator to accomplish the above mentioned objectives.

GT 6

THE USE OF IRRADIATION AS A QUARANTINE TREATMENT OF FOOD AND AGRICULTURAL COMMODITIES. Hayat Makee, Department of Molecular Biology and Biotechnology, Plant Pathology Division, Atomic Energy Commission of Syria, P. O. Box 6091, Damascus, Syria, Email: hmakee@aec.org.sy

The objectives of the current study was to demonstrate efficacy of irradiation treatment on a commercial scale. To facilitate regulations on irradiation as a quarantine treatment of fresh fruits and vegetables among trading nations, the following subjects should be considered: 1-Effectiveness of conventional commodity treatments (heat, refrigeration, chemical, others) to satisfy quarantine regulations; 2- Effectiveness of irradiation as a quarantine treatment against various species of fruit flies; 3-Effectiveness of irradiation as a quarantine treatment against insects other than fruit flies. Agricultural industries depend upon quarantine treatments using heat, cold, or chemical fumigants. Methyl bromide is widely used as an insect disinfestation fumigant. Chemical fumigants have been favored because of their effectiveness, relative ease of application, and low cost. However, dramatic changes in control methods have occurred within the past five years. Several factors lead to these changes: loss of effectiveness of residual insecticides because of significant levels of insecticide resistance in many pest populations; Consumer concerns about the environment and their health, their influence in the marketplace, and their desire for pesticide-free foods; and the trade in food and agricultural commodities could be seriously hampered when methyl bromide is phased out globally under the Montreal Protocol (an international treaty to protect the environment which has been ratified by most countries) because of its ozone depletion properties. Therefore, there is an urgent need to identify suitable alternatives to maintain food security and facilitate global trade in food and agricultural commodities. Alternative methods to fumigation including: Physical treatment (such as vapor and hot air, heat, hot water dip, refrigeration at certain temperature levels for a specific duration), and Irradiation offers considerable potential as an alternative insect disinfestation method to methyl bromide.

GT 7

USEFULNESS OF THE ESSENTIAL ELECTRONIC AGRICULTURAL LIBRARY TEEAL IN PLANT PROTECTION. Layth H. Al-Talib, Plant Protection Department, College of Agriculture and Forestry, Mosul University, Iraq, Email: laythaltalib@yahoo.com

Information is an important developing key in our modern globe. Data bases are essential phenomena of the information age, where information in traditional (hard copy) libraries are converted to TEEAL. It is of more than 140 international agricultural journals which covers all agricultural disciplines. One of these disciplines is plant protection, and it covers the period 1993-2003, and represents two million pages of full texts and is going ever year. All of these could be viewed on the computer screen, printed when needed. Data Base TEEAL contains a searching engine which scans bibliographic data base, using Keywords, Title, Author, Abstract, Journal, subject code and Language. Some of plant protection research has been extracted from bibliographic records available in this base, the extracted papers include: Insect Biochemistry 600, Insect Physiology 907, Insect Pathology 916, Insect Ecology 1043, Seed Diseases 1100, Root Diseases 1600, Insect Biology 1953, Weed Control 2128, Pesticide 2418, Economic Insect 3249, Plant Pathology 10538. This study recommends workers in plant protection to make good use of this base. It is proposed that a data base of all published plant protection research be assembled in a similar data base.

GT 8

IDENTIFICATION AND FUNCTIONAL CHARACTERIZATION OF NEW TOBACCO GENES INVOLVED IN THE INDUCTION AND REGULATION. Ahmed Gannam¹ and Serge Kauffmann². (1) Department of Molecular Biology and Biotechnology, Plant Pathology Division, AECs, P.O. Box 6091, Damascus, Syria, Email: aghannam@aec.org.sy; (2) Institute of Plant Molecular Biology, CNRS, 67084 Strasbourg, France, Email: serge.kauffmann@ibmp-ulp.u-strasbg.fr

The hypersensitive response (HR) is one of the most efficient plant defense mechanisms against pathogens. Phenotypically, the HR corresponds to the lesions developing at the infection sites. In the narrow zone surrounding the cells undergoing the HR cell death, a strong activation of defense responses occurs contributing to a local, highly inhospitable environment for the invading pathogen. This latter phenomenon was called localized acquired resistance (LAR). It corresponds to the living component of the HR. Whereas the HR is induced by exogenous signals issued from the pathogen, LAR is triggered by endogenous signals issued from the plant cells undergoing the HR. Consequently, the genes inducing LAR, whose number is not known yet, should be characterized by a HR-specific expression profile. The first part of this work was the set-up of a strategy aimed to isolate such latter genes. A screening by Differential Display Reverse Transcript Polymerase Chain Reaction allowed to isolate 24 ESTs (expressed sequence tag) with such an expression profile. The second part of the work was the functional characterization, by loss- and gain-of-function experiments, of 5 genes issued from that screen. Among the five genes, silencing by Virus-Induced Gene Silencing of *NiRING1*, encoding a putative E3 ligase with a RING-finger domain delayed the HR in tobacco induced by β -megaspermin, as well as the expression of different defense-related genes. On the other hand, the transient protein overexpression of *NtLRP1* (a small leucine rich repeat protein) abolished the HR in tobacco induced by β -megaspermin. Among the 5 genes issued from the screen and so far analyzed at the functional level, *NiRING1* and *NiLRP1* appeared involved in the execution of the HR.

GT 9

EFFECT OF MANGANESE AND BORON ON QUANTITY AND QUALITY OF SUGAR BEET BETA YIELD. Hussein Al-Mohammad, Department of Plant Protection, Faculty of Agriculture, University of Aleppo, Aleppo, Syria, Email: hussein5@scs-net.org

To study the effect of boron and manganese on the quality and quantity sugar beet yield, an experiment was carried out in the field for three years in Hama governorate. The experiment included five treatments: control without manure, 0.5 kg boron added per hectare, 1 kg B/ha, 1.8 kg Mn/ha, and 0.5 kg boron and 1.8 kg Mn/ha. Boron was applied to the soil in the form of borax, whereas Manganese was applied as foliar fertilizer as manganese sulphate, 3 sprays at various growing stages. Effects of these treatments on sugar beet yield/ha, percentage of sugar, degree of juice purity, quantity of theoretical and actual sugar/ha, and incidence of heart rot disease were evaluated. The results showed that boron under experimental conditions significantly improved the sugar beet yield in the 2nd treatment by 12.27% (average

of three years), whereas it increased by 16.28% in response to the 3rd treatment, and by 21.27% in response to the 5th treatment. The effect of boron was more evident on the sugar content, whereas the effect of manganese was more significant on the degree of juice purity. Best results were obtained in response to the 5th treatment, where the root weight, sugar content and juice purity were increased. The quantity of actual sugar per hectare was increased by 35% compared to the control treatment.

GT 10

THE BENEFITS OF ROTATIONS WITH MEDICINAL AND AROMATIC PLANTS BEFORE TOMATO CROPS ON BIODIVERSITY OF SOIL FAUNA. Marguerite A. Rizk¹, Wafi Z.A. Mikhail² and Mona M. Ghallab³. (1) Fayoum Agricultural Research station, Agricultural Research Center, Fayoum, Egypt, Email: reta1949@hotmail.com; (2) Department of Natural Resources institute of African Research & Studies, Cairo University, Giza, Egypt; (3) Plant Protection Research Institute, ARC, Dokki, Giza, Egypt.

Crop rotation is fundamental to sustainable cropping systems. A well-designed crop rotation leads to diversity and improves soil conditions as well as generate biodiversity of soil fauna and improves soil fertility. Preent experiment was carried out in a period of eight months, from November 2004 to June 2005 at Fayoum upper Egypt. Five medicinal and aromatic plants were cultivated; 1) *Origanum majorana*, 2) *Linum usatitissimum*, 3) *Ammi visnaga*, 4) *Mateicaria camomilla* and 5) *Chrysanthemum vulgare* and a sixth plot was left fallow as control. These mdicinal and aromatic plants were followed by transplanted tomato. Soil fauna populations (as activity densities) were compared in different plots cultivated with different medicinal and aromatic plants, fallow plots and in tomato rotation. The aim of this study was to evaluate the effect of medicinal and aromatic plants in rotations with tomatos, to decreassd or increased the activity and density of soil fauna as well as the functional (trophic groups) herbivores, carnivores and detritivores. The species composition of fauna were discussed. Main groups found were: Collembola, siders, ants, Diptera, Curculionidae and Aphididae. Soil fauna associated with the control plots in the first period were the most widely separted from those of other treatments. Soil fauna associated with all medicinal and aromatic plants, except with *Linum*, were clustered together. Soil fauna associated with *Linum* sp. were grouped with soil fauna associated with all tomato plots. Rotation of tomato with medicinal and aromatic plants cultivated played an essenial role in readucing herbivoeros in tomato, which can lead to the reduction of using chemicals.

GT 11

BEHAVIOUR OF WHITE POPLAR (POPULUS ALBA L) IN THE NW OF ALGERIA: SANITARY DIAGNOSIS OF FEW POPULATIONS IN THE AREA OF TLEMCEN. Labiod Mohamed¹ and Luc Lambs². (1) Département de foresterie, Université de Tlemcen 13000, Algérie, Email: m_labiod@yahoo.fr; (2) Ladybio, Université Paul Sabatier, 31055 Toulouse, France.

Among the three species of poplar from the Mediterranean flora of Tlemcen, the white poplar presents the most widely distributed species across this area. This species do not spread in wide stands, but it settled along the banks of streams and water courses, in association with ash trees (*Fraxinus oxyphylla* L.). Along the agricultural lands, poplars are useful as wind breaks. In recent years, a decline of unknown origin has affected the white poplar stands. The trees lose their leaves from the top after a yellow discoloration, and a die-back often follows. The present study reports the field observations about the decline of the white poplars. It seems to be linked to numerous factors, including drought and attack by new insect pests and fungi.

GT 12

DISSECTING RPMI-MEDIATED DISEASE RESISTANCE USING YEAST TWO-HYBRID SYSTEM. Antonious Al-Daoude¹ and Murray Grant². (1) Department of Molecular Biology and Biotechnology, Plant Pathology Division, AECS, P.O. Box 6091, Damascus, Syria, Email: aaldaoude@aec.org.sy; (2) Department of Agricultural Sciences, Imperial College, London, TN25 5AH, UK.

Plants have developed an innate surveillance mechanism that enables them to respond rapidly to attempted invasion by pathogens or parasites. Genetically this is a manifestation of the complementary expression of the pathogen avirulence (*avr*) gene and the corresponding plant disease resistance (*R*) gene,

termed the 'gene for gene' hypothesis. A common phenotype of this interaction is the induction of small necrotic lesions at the site of infection known as the hypersensitive response (HR). Plants carrying the resistance gene, *RPM1* are resistant to bacterial pathogens harbouring the avirulence gene, *avrRpm1* and the absence of either gene would lead to invasion and successful colonisation of the plants. The Apoptotic ATPase domain of *RPM1* that shares sequence similarity with other cell death proteins (the nematode CED-4 and mammalian APAF-1), was used as a bait to screen a yeast two-hybrid library made from mRNA isolated from a continuum of time points up to three hours after infection with DC3000(*avrRpm1*). A number of *RPM1* interacting proteins termed RINs were identified. The full-length interactors were obtained by screening a cDNA library of *Arabidopsis thaliana* or by RACE based PCR methods. RIN14 has predicted WD-40 motifs, a conserved domain of 10 -40aa usually ending with the dipeptide Trp-Asp, WD. *Agrobacterium*-mediated transformation using the floral dip method was utilised to generate *RIN14* transgenic plants that either express high levels of *RIN14* under the control of the 35S*CaMV* promoter (*RIN14s*) or silence it (*RIN14as*). Homozygote *RIN14s* and *RIN14as* plants were then tested for pathogenicity phenotype and bacterial growth studies using DC3000*avrRpm1*. Despite strong interaction between *RPM1* and *RIN14*, transgenic plants challenged with DC3000*avrRpm1* were found to collapse at the same time as wild-type plants. Growth studies showed no significant differences in *in planta* bacterial growth between *RIN14s*, *RIN14as* and wild-type plants. This leads to the conclusion that either *RIN14* effect on *RPM1*- mediated resistance is subtle and can not be measured or other genes are involved in this pathway.

GT 13

USING CHLOROPLAST TRANSFORMATION TO PREVENT TRANSGENE FLOW TO WILD AND WEEDY RELATIVES. Nadia Ali Haider, AEC of Syria, P.O. Box 6091, Damascus, Syria, Email: nhaider@aec.org.sy

There are increasing concerns over the possible environmental risks posed by genetically modified (GM) crops to the agro-environment. The primary concern has been focused on the possibility of transgene spread (gene flow) to other crops, or to wild and weedy relatives through sexual hybridization. Since chloroplasts are inherited maternally in the majority of angiosperm species, insertion of transgenes into the chloroplast genome (chloroplast transformation) has the potential of preventing the flow of these genes via pollen. Therefore, chloroplast transformation has been suggested to be a practical solution to the problem of transgene flow especially in the instances involving a potential for outcross between GM crops and weeds. Chloroplast transformation has been recently used very frequently for the transformation of crop plants. In this paper, the environmental risks of transgene flow, the advantages of chloroplast transformation, and using the latter to contain the transgene will be discussed. We also present some examples about using transformation of the chloroplast DNA in plant protection.

GT 13

استخدام تحوير دنا الصانعات الخضراء لمنع انتقال المورثات المستخدمة في التحوير إلى الأقارب البرية والعشبية. ناديا على
حيدر، هيئة الطاقة الذرية السورية، ص.ب. 6091، دمشق، سورية، البريد الإلكتروني: nhaider@aec.org.sy
يتزايد الخوف من المخاطر المتوقعة من استخدام المحاصيل المحورة وراثياً على البيئة الزراعية. من أهم هذه المخاوف هو احتمال انتقال المورثة المستخدمة في التحوير إلى المحاصيل الأخرى سواء كانت البرية منها أو النامية بشكل أعشاب ضارة عن طريق التهجين الجنسي. وبما أنه يتم توارث دنا الصانعات الخضراء في النباتات عن طريق النبات الأم في غالبية الأنواع كاسية البذور، يعتبر إدخال المورثة المستخدمة في التحوير في جينوم الصانعات الخضراء (تحوير الصانعات الخضراء) وسيلة لمنع انتقال هذه المورثات عن طريق حبوب اللقاح. لذلك فقد تم اقتراح تحوير الصانعات الخضراء كحل عملي لمشكلة انتقال المورثات ولا سيما في الحالات التي يحتمل فيها انتقال المورثات بين المحاصيل المحورة والأعشاب الضارة. تم استخدام تحوير الصانعات الخضراء حديثاً بصورة كبيرة في تحوير المحاصيل النباتية. سوف نناقش في هذه الورقة المخاطر البيئية الناجمة عن انتقال المورثة المستخدمة في التحوير، مزايا تحوير دنا الصانعات الخضراء، واستخدام الأخير لاحتواء المورثة المستخدمة في التحوير. كما سنعرض بعض الأمثلة عن استخدام دنا الصانعات الخضراء في تحوير المحاصيل النباتية.

Ammi visnaga، البابونج الألماني (*Mateicaria camomilla*)، والاقحوان (*Chrysanthemum vulgare*). كما ترك جزء من الأرض كشاهد بدون زراعة. شتلت بادرات الطماطم/البندورة بعد نهاية محصول النباتات الطبية والعطرية وكذلك في منطقة الشاهد لمقارنة أثر تعاقب هذه النباتات في نشاط وأعداد وتنوع حيوانات التربة وأثرها في وجود أو اختفاء أكلات الأعشاب والمفترسات والرميات. أوضحت الدراسة أن أهم أنواع حيوانات التربة السائدة وهي: الكولمبول، العنكبوت الحقيقي، النمل، ثنائية الأجنحة، والمن. ولقد وجد من الدراسة أن حيوانات التربة في منطقة الشاهد في المرحلة الأولى متغيرة في تنوعها وأعدادها مقارنة بتلك المزروعة بالنباتات الطبية والعطرية. كما وجد هذا التغير في المرحلة الثانية أي بعد التعاقب، إذ ظهر التنوع الحيوي لحيوانات التربة في الطماطم، البندورة متشابهة مع تلك التي وجدت في المرحلة الأولى مع الكتان. كما ثبت أن زراعة الطماطم/البندورة متعاقبة مع النباتات الطبية والعطرية أدت إلى خفض تعداد أكلات الأعشاب وأثرت بالتالي في تقليل استخدام المواد الكيميائية.

GT 11

مصير شجرة الحور الأبيض في منطقة تلمسان شمال غرب الجزائر. لبيوض محمد¹ ولوس لاميس². (1) جامعة أبي بكر بلقايد، كلية العلوم، قسم الغابات، ص.ب. 119، تلمسان، الجزائر، البريد الإلكتروني: m_labiod@yahoo.fr؛ (2) جامعة بول Sabatier، تولوز 31055، فرنسا.

من بين الأجناس الثلاثة لشجرة الحور المتوسطي والتي تنتشر في منطقة تلمسان شمال غرب الجزائر يعد الحور الأبيض أكثر أهمية نظراً للمساحات التي يغطيها. ينمو هذا النوع من الأشجار بصفة طبيعية على ضفاف الوديان الذي نجده عادة برفقة شجرة الدردار، كما يغرس أحياناً ككاسرات الرياح لحماية المزروعات. والحور ذو أهمية اقتصادية بالغة نظراً لنموه السريع واستغلاله في مدة زمنية قصيرة ما بين 10 إلى 12 سنة. ويعتبر خشبه غني بمادة السللوز التي تدخل في صناعة الورق. لكن في السنوات الأخيرة نشهد التدهور الصحي لهذه الشجرة مما أدى إلى موت البعض منها في فترة وجيزة. تبدأ الأعراض بالتلون غير العادي لأوراق الشجرة مما يؤدي إلى سقوطها. وبينت الأبحاث التي قمنا بها في هذا الميدان أن هذا التدهور الصحي هو نتيجة عوامل عدة نذكر منها الجفاف (نقص المياه) مع وجود حشرات جديدة وأمراض متعددة.

GT 12

دراسة معمقة في مقاومة *RPM1* النباتية باستخدام الخميرة ثنائية الهجين. انطونيوس الداود¹ وماري غرانت². (1) قسم التقانة الحيوية، دائرة أمراض النبات، هيئة الطاقة الذرية السورية، ص.ب. 6091، دمشق، سورية، البريد الإلكتروني: aaldoude@aec.org.sy؛ (2) قسم العلوم الزراعية، الكلية الملكية، جامعة لندن، كنت، بريطانيا.

طورت النباتات عبر العصور نظاماً دفاعياً مهماً أساسية الإستجابة السريعة للممرضات والطفيليات الموجودة حوله. وراثياً، تعد ظاهرة فرط الحساسية (موت الخلايا النباتية حوت منطقة الإصابة HR) من أهم آليات الدفاع المستخدمة لإيقاف إنتشار المرض، ويتطلب التعبير عنها وجود مورث عدم الشراسة في العامل الممرض (*Avr*) ومورث المقاومة الخاص به في النبات (*R*)، ويؤدي غياب أي منهما إلى حدوث المرض (Gene-for-gene hypothesis). يمنح المورث *RPM1* النباتات الحاملة له مقاومة فرط الحساسية لمعظم أنواع البكتيريا الحاملة لمورث عدم الشراسة *avrRpm1*. استخدم الجزء المشابه لمنطقة الموت من المورث *RPM1* (The Apoptotic ATPase domain) كقطع (bait) لمسح مكتبة الخميرة ثنائية الهجين (Yeast two-hybrid library) والمشكلة من الرنا الرسول لنبات الأرابيدوبسيس *Arabidopsis thaliana* بعد لقاحه ببكتيريا DC3000 (*avrRpm1*) بهدف عزل وتحديد المورثات المؤلفة والمكونة لشبكة نقل إشارات (*RPM1* signaling network) المقاومة للبكتيريا والتي يتحكم بها *RPM1*. أسفر المسح عن عزل عدد من المورثات التي تتفاعل مع مورث المقاومة *RPM1* نذكر منها: *RIN14* (RPM1 Interacting Protein 14). تم الحصول على الـRINs بطولها الكامل عن طريق مسح مكتبة أخرى (cDNA) أو باستخدام تقنية RACE-PCR. يتميز *RIN14* باحتوائه على منطقة تعرف باسم WD-40 وهي منطقة محافظة عند مختلف الكائنات الحية وتتكون عادة من عدد من الأحماض الأمينية يتراوح عددها بين 10-40 حمضاً أمينياً وعادة ما تنتهي بـTrp-Asp. استخدمت بكتيريا *Agrobacterium tumefaciens* وطريقة غمر البراعم الزهرية (Floral Dip Method) لإنتاج نباتات الأرابيدوبسيس المحورة وراثياً حيث حور بعضها لإنتاج منتج المورث *RIN14* بكميات مرتفعة (*RIN14s*) وبمختلف الأنسجة النباتية، بينما عمل بعضها الآخر على تثبيط المورث موضوع الدراسة (*RIN14s*). اختبرت النباتات المحورة والمتمائلة للواقع (*RIN14* homozygote) عن طريق حقنها ببكتيريا *Pseudomonas syringae* pv. *tomato* سلالة DC3000 الحاوية على المورث البكتيري *avrRpm1*. على الرغم من التفاعل القوي بين *RPM1* و *RIN14* فقد تطابقت استجابة النباتات المحورة بالمورث *RIN14* مع نباتات الشاهد، وكان النمو البكتيري متشابهاً في النباتات المحورة والشاهد، ولم يتأثر توقيت ظاهرة فرط الحساسية بتثبيط *RIN14* أو زيادة منتج الأمر الذي يشير إلى وجود مورثات أخرى مهمة ومتعاضدة في مسار المقاومة *RPM1-avrRpm1* أو أن تأثير *RIN14* في هذه المقاومة بسيط ولا يمكن قياسه.

هو ما يحدث في الخلايا المحيطة بمنطقة الموت الخلوي، حيث يلاحظ تفعيل قوي لعدد كبير من آليات الدفاع النباتي ضد الممرض. المنطقة المكونة من مجموع هذه الخلايا الحية تعتبر الجزء الحي من ظاهرة فرط الحساسية وتسمى بمجمها منطقة المقاومة المحلية المكتسبة (LAR = Localized Acquired Resistance). المورثات المسؤولة عن تحريض وتنظيم ظاهرة المقاومة المحلية المكتسبة تمتلك نمط تعبير وراثي خاص حصراً بفرط الحساسية (HR-Specific Expression Profile). الهدف الأول من العمل تركز على توظيف إستراتيجية جديدة تسمح بعزل عدد من المورثات المسؤولة عن تحريض وتنظيم ظاهرة المقاومة المحلية المكتسبة عند نبات التبغ (*Nicotiana tabacum*). بداية جرى تطبيق تقنية (DD RT-PCR = Differential Display Reverse transcription-PCR) بهدف عزل وتحديد المورثات المسؤولة عن تحريض وتنظيم ظاهرة المقاومة المحلية المكتسبة. أسفر هذا المسح عن عزل 24 قطعة وراثية تعبيرية (EST = Expressed Sequence Tag). تتميز ESTs بامتلاكها نمط تعبير وراثي خاص بفرط الحساسية في نبات التبغ رداً على محرض فطري (*Fongic Elicitor*) مستخلص من *Phytophthora megasperma*. كان الهدف الثاني من هذا العمل القيام بتوصيف وظيفي لبعض المورثات التابعة لهذه ال ESTs. تمت الدراسة الوظيفية لخمسة منها باستخدام إستراتيجيتي اكتساب وفقد الوظيفة الخلوية (Loss- and Gain-of-Function). سمحت إستراتيجية فقد الوظيفة الخلوية باستخدام تقنية (VIGS = Virus Induced Gene Silencing) بإظهار تأخر نوعي ملحوظ في ظهور الموت الخلوي عند إسكات المورثة *NiRING1* المعزولة في المسح السابق. بالمقابل، سمحت إستراتيجية كسب الوظيفة الخلوية باستخدام تقنية (Transient Protein Overexpression Patching) بإظهار غياب نهائي للموت الخلوي فرط الحساس عند النباتات التي تنتج كميات عالية من البروتين المشفر بالمورثة *NiLRPI* المعزولة أيضاً من المسح السابق. بينت هذه الدراسة أهمية كل من المورثتين *NiLRPI* و *NiRING1* في جعل النبات أكثر مقاومة لعدد من الممرضات وكذلك فتحت لنا أفقا جديدة في فهمنا لظاهرتي فرط الحساسية والمقاومة المحلية المكتسبة عند النبات.

GT 9

تأثير المنغيز والبورون في الإنتاج الكمي والنوعي للشوندر السكري/البنجر. حسين غضبان المحمد، قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية، البريد الإلكتروني: hussein5@scs-net.org
تم تنفيذ تجربة حقلية مدتها ثلاث سنوات متتالية في محافظة حماة لدراسة تأثير البورون والمنغيز في إنتاجية الشوندر السكري من الناحيتين الكمية والنوعية. تكونت التجربة من خمس معاملات: الأولى شاهد بدون تسميد، والثانية تم إضافة 0.5 كغ من عنصر البورون للهكتار، والثالثة 1 كغ من عنصر البورون للهكتار، بينما أضيف في المعاملة الرابعة 1.8 كغ من عنصر المنغيز للهكتار، وتم إضافة 0.5 كغ من عنصر البورون و 1.8 كغ من عنصر المنغيز للهكتار في المعاملة الخامسة. أضيف البورون على هيئة بوراكس ($Na_2B_4O_7 \cdot 10H_2O$) إلى التربة قبل الزراعة، بينما أضيف المنغيز رشا على الأوراق على هيئة سلفات المنغيز ($MnSO_4$) وعلى ثلاث دفعات خلال مراحل النمو. تم دراسة تأثير هذه المعاملات في الإنتاج الكمي (وزن الجذور في الهكتار) وفي نوعية الإنتاج (نسبة السكر في الجذور ونقاوة العصير وكمية السكر النظري والفعلي في الهكتار وكذلك في ظهور مرض القلب الأجوف في الجذور). بينت النتائج أن إضافة البورون ضمن شروط التجربة يؤدي إلى تحسين الإنتاج الكمي بشكل معنوي في المعاملة الثانية بمعدل 12.27% بالمتوسط للثلاث سنوات، بينما تجاوزت هذه الزيادة 16.28% في المعاملة الثالثة، ولكن إضافة البورون والمنغيز في المعاملة الخامسة حقق أفضل النتائج بزيادة 21.23% بالمتوسط. إن تأثير البورون كان أكثر وضوحاً على نسبة السكر في الجذور إذ تفوقت المعاملات الثانية والثالثة بشكل معنوي على بقية المعاملات بينما كان تأثير المنغيز مميّزاً على نسبة نقاوة العصير في الثلاث السنوات. أعطت المعاملة الخامسة أفضل النتائج سواء على مستوى وزن الجذور أو من خلال تحسين المواصفات التصنيعية المختلفة للجذور (نسبة السكر ونقاوة العصير) مما انعكس بشكل معنوي على كمية السكر الفعلي بالهكتار، إذ تفوقت المعاملة الخامسة على الشاهد بمعدل 35%.

GT 10

فائدة تعاقب محصول الطماطم/البندورة بعد النباتات الطبية والعطرية على تنوع حيوانات التربة. مارجريت عدلي رزق¹، وفائي ذكي عازر ميخائيل² ومنى محمد غلاب³. (1) مركز البحوث الزراعي، معهد بحوث وقاية النباتات، محطة البحوث الإقليمية بالقيوم، مصر، البريد الإلكتروني: reta1949@hotmail.com؛ (2) معهد البحوث والدراسات الأفريقي، جامعة القاهرة، مصر؛ (3) مركز البحوث الزراعي، معهد بحوث وقاية النباتات الدقي، جيزة، مصر.
يعتبر تعاقب المحاصيل من الأشياء الأساسية في مساندة النظام المحصولي. فالتصميم الجيد في تعاقب المحاصيل يؤدي إلى التنوع وتحسين التربة وكذلك تنوع حيوانات التربة الذي يؤدي إلى خصوبة التربة. تم إجراء التجربة خلال ثمانية أشهر من تشرين الثاني/نوفمبر 2004 حتى تموز/يونيو 2005 بالقيوم في مصر العليا. زرعت خمسة أنواع من النباتات الطبية والعطرية وهي: البردقوش (*Origanum majorana*)، الكتان (*Linum usatitissimum*)، الخلة البلدي

وتحديد الخطر منها لتبيان ضرورة حجر البواء أو عدمه، (3) دراسة المعقوات الفنية والإدارية التي قد تعيق عملية المجانسة، تطوير قاعدة بيانات على المستوى الإقليمي لمراجعة إحتياجات وقاية النباتات بما فيها الحجر الزراعي. بما لا شك فيه إن تأسيس منظمة وقاية النباتات للشرق الأدنى سيساهم بشكل فعال لإتمام تلك الضرورات الواردة أعلاه.

GT 6

استخدام الأشعة في مجال الصحة النباتية والحجر الزراعي. حياة المكي، قسم البيولوجيا الجزيئية والتقانة الحيوية، دائرة أمراض النبات، هيئة الطاقة الذرية، ص.ب. 6091، دمشق، سورية، البريد الإلكتروني: hmakee@aec.org.sy
عندما يتم التساؤل عن مدى سلامة المواد الغذائية المعاملة بالمواد الكيميائية تظهر ضرورة استخدام الأشعة كوسيلة من وسائل الحجر الزراعي. يمكن استخدام الأشعة المؤينة لمكافحة حشرات المواد المخزونة إما عن طريق تطبيق تقانة الحشرات العقيمة أو عن طريق تعقيم وتطهير المواد المخزونة. تهدف الدراسة الحالية إلى إظهار إمكانية استخدام الأشعة في المجال التجاري. لتسهيل الأنظمة المرعية عند استخدام الأشعة في معاملات الحجر الزراعي للخضار والفواكه بين الدول، لا بد من التركيز على الموضوعين التاليين: (1) فاعلية المعاملات الحجرية التقليدية (الحرارة، التبريد، الكيميائية وغيرها) بصورة ترضي أنظمة الحجر. (2) كفاءة الأشعة عند استخدامها في معاملات الحجر الزراعي ضد أنواع مختلفة من ذبابة الفاكهة وأنواع أخرى من الحشرات. يستخدم ميثيل البروميد، كمادة مبخرة، بشكل واسع في معاملات الحجر الزراعي. ويفضل استخدام أخرة بعض المواد الكيميائية في معاملات الحجر الزراعي نظراً لفاعليتها وسهولة تطبيقها وقلة تكاليفها نسبياً. إلا إنه خلال الخمس سنوات الأخيرة حصلت تغيرات مفاجئة في طرائق المطبقة في مكافحة الآفات الحشرية. وأسهم عدد من العوامل في تلك التغيرات منها: تطور صفة المقاومة لدى العديد من الحشرات، زيادة وعي المستهلك حول حماية البيئة والصحة العامة، وإمكانية إلحاق ضرر كبير في تجارة المواد الزراعية والغذائية عند تطبيق بروتوكول منتريال حول منع استخدام ميثيل بروميد في معاملات الحجر الزراعي بصورة نهائية. وأصبح أمراً ضرورياً إيجاد طرائق بديلة يمكن تطبيقها في معاملات الحجر الزراعي لضمان صحة الغذاء وتسهيل الحركة التجارية العالمية، ومن هذه الطرائق: الطرائق الفيزيائية (مثل بخار الماء والهواء الساخن، الماء الساخن، التبريد عند درجات حرارة محددة لفترات زمنية معينة) والأشعة التي يمكن اعتبارها كطريقة بديلة فاعلية في معاملات الحجر الزراعي.

GT 7

الاستفادة من المكتبة الإلكترونية الزراعية الأساسية TEEAL في وقاية النبات. ليث حمدي الطالب، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: laythaltalib@yahoo.com
تعدّ تقانة المعلومات وقواعد البيانات مفاتيح التنمية في عالمنا المعاصر، وتحولت المكتبة التقليدية الورقية إلى مكتبة الكترونية، وتعدّ مكتبة TEEAL توليفة لأكثر من 140 مجلة زراعية علمية محكمة عالمية تغطي النشاط الزراعي، ومن بينها مجلة وقاية النبات للسنوات 1993-2003 التي تمثل تقريباً 2 مليون من صفحات النص الكامل التي تحدث سنوياً ويمكن مشاهدتها على شاشة الحاسوب أو خزنها أو طباعتها. تحوي هذه القاعدة على محرك بحث يعمل على مسح قاعدة بيانات بيليوغرافية حسب الكلمات الدالة، عنوان البحث، المؤلف، الملخص، اسم المجلة، الرقم الدولي للمجلة، اللغة، مع إمكانية الربط فيما بينهم. تم استخراج التسجيلات البلوغرافية الخاصة ببعض محاور وقاية النبات والمتاحة على هذه القاعدة، وتم تحليل بعض بيانات هذه البحوث. بلغ عدد البحوث لمستخرجة كما يلي: كيمياء حيوية الحشرات 600، فيزيولوجيا الحشرات 907، أمراض الحشرات 916، بيئة الحشرات 1043، أمراض البذور 1100، أمراض الجذور 1600، حياتية الحشرات 1953، مكافحة الأدغال/الأعشاب 2128، مبيدات 2418، حشرات اقتصادية 3249. توصي الدراسة باعتماد مكتبة TEEAL من قبل الباحثين في وقاية النبات لتوفير البحوث بالنص الكامل، ويقترح الباحث عمل قاعدة بيانات بالبحوث الخاصة بوقاية النبات الصادرة باللغة العربية.

GT 8

تعريف وتوصيف وظيفي للمورثات المسؤولة عن تحريض وتنظيم ظاهرتي فرط الحساسية والمقاومة المحلية المكتسبة في نبات التبغ. أحمد غنام¹، سيرج كوفمان². (1) قسم التقانة الحيوية، دائرة أمراض النبات، هيئة الطاقة الذرية السورية، ص.ب. 6091، دمشق، سورية، البريد الإلكتروني: aghannam@aec.org.sy؛ (2) معهد البيولوجيا الجزيئية النباتية، المركز الوطني الفرنسي للبحوث العلمية، ص.ب. 67084، ستراسبورغ، فرنسا، البريد الإلكتروني: serge.kauffmann@ibmp-ulp.u-strasbg.fr

تعدّ ظاهرة فرط الحساسية (HR = Hypersensitive Response) واحدة من أهم آليات الدفاع المستخدمة من قبل النبات لإيقاف المرض. هذه الظاهرة تعبر في جزئها الأساسي عن لجوء النبات إلى القتل السريع والمبرمج (PCD = Programmed Cell Death) لخلاياه المحيطة بنقطة دخول الممرض (Pathogen). الجزء الثاني من هذه الظاهرة

المنطقة، فقد تم تطبيق مشروع مكافحة متكاملة/مدارس حقلية في منطقة فري دون كنار، حيث تم تنظيم مزارعي الأرز ضمن 15-25 عضواً في مجموعات العمل للقيام بمختلف عناصر مكافحة المتكاملة/المدارس الحقلية في حقولهم. ومن نتائج المشروع انخفاض استعمال المبيدات بنسبة 80-100%، بينما ارتفعت الإنتاجية بمقدار 17-25%. وقد وجد المزارعون من خلال البحث الجماعي أساليب بديلة مثل single transplantation التي أظهرت فعالية أكبر من الطريقة التقليدية بمراقبة blast واستعمال الإوز والسك لمكافحة آفة azolla واستراتيجيات تحضير البذور. ولدى إختبار الأثر المتبقي للديازينون " بمستوى 5 جزء/مليون"، وجد أنه أقل بعشر مرات عما هو عليه بالمزارع الأخرى. وتساعد هذه الإستراتيجية، منذ بداية المشروع، في الإقتراب من متطلبات الزراعة العضوية. وبالرغم من انتهاء المشروع في عام 2005، فإن المزارعين يتابعون أنشطتهم ضمن مجموعات المدارس الحقلية، وثمة اهتمام لدى المزارعين المجاورين للإلتحاق بهم.

GT 4

المكافحة المتكاملة عن طريق مدارس المزارعين في الزراعات المحمية في إيران. حسين حيدري¹، محمد شريف² وفاطمة ميرزا². (1) معهد بحوث أمراض وأفات النبات، ص.ب. 1454-19395، طهران، إيران، البريد الإلكتروني: hheidari_2000@yahoo.com (2) معهد تنمية القرى الخضراء، ص.ب. 115-19835، طهران، إيران.

نفذت مكافحة المتكاملة في ست بلدان من الشرق الأدنى كمشروع GTFS/REM/070/ITA وذلك خلال الفترة ما بين 2004-2006 على عدة محاصيل خضار وفاكهة، بما فيها العنب وزراعات الخيار المحمية في إيران. وفي الواقع اتسعت مساحة وكذلك إنتاج زراعات الخيار المحمية بشكل سريع في إيران خلال الأعوام القليلة الماضية، وازدادت معها المشاكل المتعددة المتعلقة بالحشرات والأمراض. ففي بعض الدفنيات يرش المحصول حتى 30 رشة/الموسم، الأمر الذي يتولد عنه مخاطر صحية وبيئية جادة. وطبق لأول مرة في إيران تطبيق مبدأ مشاركة المزارعين في مكافحة المتكاملة، وذلك لحل بديل لإدارة الآفات في زراعات الخيار المحمية في كل من جيروفت (كرمان) وفارمين (طهران). ونتيجة لهذا النشاط، انخفض استخدام المبيدات الكيميائية بحدود 80%، إذ تعلم المزارع بأن الغالبية العظمى من الرش الكيميائي لم يكن فاعلاً وغير ضروري، وذلك نتيجة مشاركتهم في تحليل النظام البيئي. وكان هناك طرائق عدة بديلة مثل استخدام الفيلفة، كربونات الصوديوم (صودا)، مستخلص التبغ، *Salsola*، *Chenopodium* ونباتات أخرى محلية، ومصائد صفراء لاصقة، ومحاصيل مصيدة. واستخدمت تلك البدائل بنجاح من قبل المزارعين واستخدمت في تطبيقاتهم العملية لحماية نباتاتهم. ونتيجة لانخفاض استخدام المبيدات الكيميائية التي شكل حوالي 30% من تكاليف الإنتاج في المشروع، فقد جنى المزارعين المشاركون في المشروع فوائد أخرى جمة مقارنة بالمنتجين الآخرين.

GT 5

مجانسة قوانين الحجر الزراعي للدول العربية. سهام أسعد، زاودي بيشاو وخالد مكوك، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.asaad@cgiar.org
ازداد حجم تبادل البذار والمنتجات النباتية عبر الحدود الدولية في السنوات الأخيرة بشكل كبير. ورافقت هذه الزيادة ارتفاعاً في مخاطر واحتمالات إنتقال الممرضات المحمولة في أو على البذار لمناطق وبلدان لم تكن موجودة فيها سابقاً. وأدى ذلك إلى تبني عدد كبير من الدول قوانين وإجراءات متشعبة ومعقدة للحجر الزراعي أثرت بشكل سلبي على النشاط التبادلي لهذه السلع الحيوية بين الدول. وللحد من الآثار السلبية لتعقيبات الحجر الزراعي تلزم قوانين الحجر الصحي والزراعي (SPS) للمنظمة الدولية للتجارة (WTO) والمعاهدة الدولية لوقاية النبات (IPPC) المبرمة برعاية منظمة الأغذية والزراعة العالمية (FAO) الدول الموقعة عليها على ضرورة تقدير خطر الآفات الزراعية على أساس علمي ويفضل أن يكون من خلال استخدام إجراءات وطرق قياسية مطورة ومعتمدة دولياً. لقد تم تطوير قوانين الحجر الزراعي والوقاية من الأوبئة في كثير من البلدان المتقدمة على المستوى المحلي، كما عملت هذه الدول على مجانسة قوانين وسياسات البذور ضمن إطار عمل يهدف إلى تقييم الأصناف وتحديد تاريخ اعتماد البذور المصدقة وكذلك وقاية الأصناف بما فيها قوانين الحجر الزراعي ومعايير وضرورات إصدار الشهادات الصحية على المستوى الإقليمي. بعض من تلك الأمثلة من دول أمريكا الوسطى (كوستاريكا، السلفادور، جواتيمالا، هندوراس، نيكاراغوا، وباناما) وكذلك تجمعات غرب أفريقيا التي تشمل كينيا، تانزانيا، وأوغندا، ودول جنوب غرب آسيا التي تضم الهند، أندونيسيا، تاليندا، الفلبين، وفيتنام المنضوية تحت إتحاد آسيا والباسيفيك للبذار حيث قام هذا الإتحاد بدراسة الأوبئة المحجورة والطرق والإجراءات الإدارية للتبادل في كل دولة على حدة ثم عملت على توحيدها بين الدول الخمس. لكن قوانين الحجر الزراعي في أغلب أقطار الشرق الأوسط وشمال أفريقيا ما زالت بحاجة إلى تطوير، حيث أنها لم تصل بعد إلى المستوى العالمي المطلوب. وكذلك البلدان العربية بحاجة لتطوير أو تحديث قوانين الحجر الزراعي لديها على المستوى الإقليمي. تناقش ورقة العمل هذه ضرورة مجانسة قوانين الحجر الزراعي على المستوى الإقليمي للدول العربية والدول المجاورة لها من خلال: (1) دراسة الواقع الحالي لقوانين الحجر الزراعي وتطبيقاته، (2) تحديد أوبئة الحجر الزراعي

GT 1

الإدارة المتكاملة للآفات في نظام محصولي البقوليات الغذائية والحبوب في المغرب عبر البحث التشاركي مع المزارعين. السعيدية الحلوي¹، رشيد دحان¹، حسن اوعبو¹، ادريس حضرباش¹، فؤاد عباد¹، حميدة هلال¹، حميد رمضان¹، شريف إسماعيلي¹، مصطفى البوحسيني² وعمر يحيوي². (1) CRRA, INRA, ص.ب. 589، سطات، المغرب؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة، إيكاردا، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: slhaloui@yahoo.com، lhaloui@hotmail.com

يعد المغرب بلد زراعي بالدرجة الأولى، وخصص أكثر من ثلثي الأراضي المزروعة سنويا لزراعة الحبوب والبقوليات. تتعرض هذه الزراعات للإصابة بعدد كبير من الآفات التي تحد من مردوديتها، ومن جودة منتوجها. وتشكل ذبابة البس أهم آفة حشرية تصيب القمح، وتصل الخسائر الناتجة عنها إلى 30% سنويا، وقد تصل إلى 100% في حالة الزراعة المتأخرة. كما تلحق الأمراض والأعشاب الضارة خسائر جسيمة بالمحصول. تتأثر البقوليات بعدد من الأمراض والحشرات إضافة إلى الهالوك. وتم إدماج كل التقنيات المتوفرة لمكافحة هذه الآفات ضمن برنامج التعاون بين المغرب وإيكاردا، وتم تطبيقها في الحقل في أن واحد عند مزارعين نموذجيين بإشراكهم في جميع القرارات. أوضحت النتائج أن مردود الأصناف الجديدة التي طبقت عليها تقنيات أخرى لمكافحة الآفات بلغ ضعف مردود الأصناف المستعملة من طرف الفلاحين/المزارعين. كما بلغ مردود الحمص الشتوي ضعف أو أربع أضعاف مردود الحمص الربيعي. ومكنت هذه التجارب من إظهار فاعلية الرش المبكر ضد الأعشاب الضارة، ومكافحة الأمراض قبل تفشيها. وتم تنظيم عدة أيام دراسية في الحقل، أسفرت عن نتائج جد فعالة في نوعية الفلاحين وارشادهم للتقنيات الحديثة. كما وفرت فرصة ثمينة للنقاش في الحقل والقيام بجولات إعلامية على التجارب لمشاهدة النتائج في عين المكان.

GT 2

المكافحة المتكاملة للآفات الزراعية من خلال مدرسة المزارعين الحقلية طريقة إرشادية جديدة في الأردن. أشرف الحوامده¹، ألفريدو إمبياز² وزكريا مسلم³. (1) مشروع المكافحة المتكاملة، وزارة الزراعة، الأردن؛ (2) مكتب الفاو، ص.ب. 10709، سورية؛ (3) وزارة الزراعة، الأردن، البريد الإلكتروني: zak682001@yahoo.com

مدرسة المزارعين الحقلية (م. م. ح) هي برنامج تدريبي حقل يستمر لموسم كامل مع المزارعين وتتابع نشاطات التدريب المراحل المختلفة لتطور المحصول وإجراءات المكافحة المتعلقة. يوجد نماذج مختلفة لمدارس المزارعين الحقلية ولكن تتركز العملية دائما حول المتعلمين ومشاركاتهم والاعتماد على طريقة التعلم بالتجربة. وبشكل عام فإن مدرسة المزارعين الحقلية تركز على المناطق الزراعية الأقل حظا وهناك أيضا اهتمام بالقطاع النسوي الذي يعمل بالزراعة. مدرسة المزارعين الحقلية للمكافحة المتكاملة كوسيلة سريعة وسهلة لنقل نتائج الأبحاث التي تتعلق بعلوم وقاية النبات وتعمل هذه المدارس أيضا على التطبيق العملي لهذه النتائج وتأكيد نتائجها حقليا. قطاع المزارعات يلعب دورا هاما في مدرسة المزارعين الحقلية للمكافحة المتكاملة إما كأعضاء في هذه المدارس الحقلية أو مشرفات على هذه المدارس الحقلية. مدرسة المزارعين الحقلية للمكافحة المتكاملة إحدى مكونات مشروع المكافحة المتكاملة للآفات الزراعية لدول الشرق الأدنى والذي يتم تنفيذه من قبل منظمة الأغذية والزراعة الدولية (الفاو) التابعة للأمم المتحدة وبتمويل من الحكومة الإيطالية. بدأ الأردن في تنفيذ 7 مدارس حقلية للمزارعين في السنة الأولى للمشروع في عام 2004 في المناطق المرتفعة وديرعلا وغور الصافي ونظرا للنتيجة الإيجابية التي تحققت في هذه المدارس ورغبة المزارعين في المشاركة بلغت هذه المدارس 24 مدرسة حقلية للمزارعين في مجال المكافحة المتكاملة للآفات الزراعية في السنة التالية. وفيما يلي أهم نتائج هذه المدارس الحقلية في الأردن: (1) التطبيق العلمي والعملية السليم للتقييم الحيوي والشمسي وكبدائل لغاز الميثيل برومايد. (2) التعرف على الآفات الزراعية والأعداء الحيوية. (3) مراقبة المحصول والآفات. (4) زيادة قدرة المزارع على اتخاذ القرار المناسب في مزرعته. (5) تحليل النظام البيئي الزراعي كخطوة أولى لاتخاذ القرار وكبديل للتعبة الاقتصادية. (6) مكافحة الآفات والاستخدام الأمثل للمبيدات. (7) طرق المكافحة المتكاملة للآفات.

GT 3

الإنتاج والحماية المتكاملتين لحقول الأرز من خلال المدارس الحقلية في منطقة بحر القزوين. حسين حيدري¹، محمد شريف² وفاطمة ميرزا². (1) معهد بحوث أمراض وآفات النبات، ص.ب. 1454-19395، طهران، إيران، البريد الإلكتروني: hheidari_2000@yahoo.com؛ (2) معهد تنمية القرى الخضراء، ص.ب. 115-19835، طهران، إيران.

يعتبر الأرز محصولا غذائيا أساسيا في إيران ويزرع في قرابة ألف هكتار خاصة في منطقة ساحل بحر قزوين. يعتبر حفار الساق الآفة الأساسية في حقول الأرز بإيران والذي تم إدخاله في عام 1970. واستعملت فيما مضى المكافحة الكيميائية على نطاق واسع بسبب غياب المعطيات البيئية الأساسية. وضمن خطة عامة لإيجاد طرق بديلة لمكافحة الآفات في

مواضيع عامة

البنّي الكبير *Eobania vermiculata* كان أكثر أنواع القواقع انتشاراً في بساتين الفاكهة، أما قوقع البرسيم *Monacha obstrcta* فكان أكثر القواقع انتشاراً في حقول البرسيم. قواقع الحدائق الصغيرة *Theba pisana*، وقواقع الرمل الأبيض *Helicella vestalis* كانا أكثر القواقع انتشاراً في مزارع الخضر ونباتات الزينة. وبينت نتائج المكافحة أن طعموم مبيدات مجموعة الأوكسيم كاربامات (25 مادة فعالة) أكثر المبيدات فاعلية كمبيدات قواقع، بينما الطعموم الجاذبة السامة لمبيدات كونفيدور (أيميدا كلوبرايد)، كيمازد (كربندازيم)، راجبي (كاداسافوس)، دبتركس (تراي كلورفون)، روك (بكتيريا B.t)، كوسيد (هيدروكسيد نحاسيك)، أكروبات نحاس أعطت نسب موت للقواقع بين 7-55%. سببت محاليل اليوريا (10% و 15%) رشاً فوق جذوع الأشجار إلى نسب قتل للقواقع 90% و 100% وذلك خلال فترة التصاق القواقع فوق الجذوع، كما أدت محاليل اليوريا (10%) مخلوطة مع مبيد كربندازيم (2%) سلفات البوتاسيوم والألومنيوم (الشب البوتاسي) بتركيز 2.5% إلى خفض الإصابة بنسبة 100%، وغير أن محاليل اليوريا تسبب سمية للمجموع الخضري (في صورة حرق للأوراق) إذا وصل محلول الرش إليها.

الشمس التي تكون منطقة العقم في أقراصها قليلة والتي تكون أقراصها مسطحة أو قليلة التحدب وزاوية القرص فيها 16-25 درجة هي المفضلة في عملية التريية بما يتناسب وتقليل أضرار الطيور.

RO 9

مقاومة أصناف عباد الشمس لأضرار الطيور في إيران. أبو القاسم خالقي زادة¹ وإسماعيل علي زادة². (1) مخبر علم الطيور، قسم علم الحيوان الزراعي، معهد بحوث آفات وأمراض النبات، إيران، البريد الإلكتروني: akhaleghizadeh@yahoo.com (2) مركز البحوث الزراعية في غرب آذربيجان.

أجريت تجربة حقلية خلال العامين 2003-2004 في محطات البحوث العلمية الزراعية في منطقتي كراحي وخوي في إيران، وذلك لتقييم مقاومة أصناف مختلفة من عباد الشمس للأضرار التي تسببها الطيور. تم اختيار 1309 من أقرص عباد الشمس عشوائياً لتقييم الأضرار. بلغ متوسط الضرر 45.3% في منطقة كراحي، بينما كان 21.03% في منطقة خوي. في منطقة كراحي، كان الصنف Zarghan حساساً، وبلغت نسبة الإصابة (82.75%)، أما الصنف CMS19 فقد أبدى مقاومة عالية (2.1%). أما في منطقة خوي فقد كان الصنف Sor حساساً (65.1)، بينما أبدى الصنف Eroflor مقاومة عالية (0.2%). في كراحي، كانت معدلات الضرر على الأصناف مبكرة النضج (39.98 ± 51.29) ($n=300$) أعلى منها في الأصناف متأخرة النضج (38.44 ± 41.64) ($n=719$). تم تضمين عدد من القياسات المورفولوجية/الشكلية؛ ارتفاع قرص عباد الشمس عن سطح التربة (سم)، قطر القرص (سم)، معدل قطر القرص إلى قطر المنطقة العقيمة في وسط القرص (%، زاوية القرص، شكل القرص وشكل الساق، عند تحليل معدلات الضرر. تُدرس الارتباط من أجل العوامل الأربعة الأولى في حين استخدم تحليل التباين من أجل العاملين الآخرين. كان ارتباط الضرر معنوياً فقط مع ارتفاع القرص عن سطح التربة عند الأصناف Azargol، Esfahan، CMS522/2، Alstar. ومع قطر القرص للأصناف Zaria و CMS522/2 و Record ومع نسبة قطر القرص إلى قطر المنطقة العقيمة وسط القرص للأصناف Zarghan، 106، Armavirski، Esfahan و Zaria، وكذلك مع زاوية القرص للأصناف Mehr، 106، 308، 407، Shahroud، CMS1052 و Alstar ($P < 0.05$). أظهر تحليل التباين اختلافًا معنوياً بين مجموعات شكل القرص للأصناف Azargol، Shfagh، 210 و 304 وشكل الساق للأصناف Azargol، Shahroud، Zarghan و Sor ($P \leq 0.05$).

RO 10

التغيرات الموسمية لتعداد بعض القواقع الأرضية والمكافحة الكيميائية في حدائق العنب بمصر. السيد حسن عشرة¹، سيد عبد العزيز منتصر²، مدحت محمد أحمد² وحسن إبراهيم الديب¹. (1) قسم بحوث الحيوانات الضارة بالزراعة، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، القاهرة، مصر، البريد الإلكتروني: eheshra@yahoo.com (2) قسم الحيوان الزراعي والنيماطودا، كلية الزراعة، جامعة الأزهر، مصر.

أجريت عدة تجارب حقلية في مناطق مختلفة بمصر لحصر ومكافحة القواقع الأرضية، وقد بينت النتائج أن أكثر المناطق إصابة سجلت بمنطقة أبيس بالإسكندرية، حيث كانت قواقع الحدائق الصغير *Theba pisana* هي أكثر الأنواع انتشاراً، إذ بلغت نسبته 37% بينما كان نسبته 43% في منطقة المعمورة بالإسكندرية. في محافظة البحيرة كانت أشد المناطق إصابة هي مركز كفر الدوار ثم مركز الدلنجات وكان أكثر القواقع انتشاراً هو القواقع السابق، تلاه قواقع الحدائق البني الكبير *Eobania vermiculata*. وأظهرت دراسة التغيرات الموسمية للقواقع في محافظتي الإسكندرية والبحيرة أن أعلى تعداد سجل خلال شهر أيار/مايو كان لقواقع الحدائق البني الكبير وخلال شهر حزيران/يونيو لقواقع الحدائق الصغير بينما سجل أعلى تعداد لقواقع الرمال ثم قواقع النخيل *Cochlicella acuta* خلال شهر آب/أغسطس. تراوح متوسط عدد القواقع بين 108-280 قواقع/شجرة في مزارع العنب بالإسكندرية وبين 80-107 قواقع/شجرة في محافظة البحيرة. وفي دراسة تقييم سمية مبيدات الميثوميل، الثيوديكارب، الالديكارب، الميتالدهيد والابامكتين في صورة طعوم سامة، وجد أن أكثر الطعوم كفاءة في مكافحة كان طعم الميثوميل تلاه الالديكارب ثم الميتالدهيد والثيوديكارب والابامكتين، حيث تراوحت نسبة الموت بين 83.6 و 23% ضد قواقع الحدائق البني الكبير، بينما تراوحت نسب الموت من 83.4 و 20.5% مع طعوم الالديكارب والميثوميل والميتالدهيد، والثيوكارب والابامكتين تجاه قواقع الحدائق الصغير.

RO 11

حصر ومكافحة القواقع الأرضية باستخدام المبيدات واليوربا. محمد سعيد الشحات، محطة بحوث وقاية النباتات، مركز البحوث الزراعية، الإسكندرية، مصر، البريد الإلكتروني: ayten999@yahoo.com، profelshahaat@yahoo.com تعتبر القواقع الأرضية آفات زراعية خطيرة في مصر، لذلك أجريت هذه الدراسة بغرض حصر تلك الآفات في المزروعات المتنوعة مع فاعلية بعض المبيدات الكيماوية ومحلول اليوربا لمكافحتها. وقد بينت نتائج الحصر أن قواقع الحدائق

RO 6

السلوك والتفضيل الغذائي لخفاش الفاكهة المصري (*Rousettus agyptiacus*) تحت الظروف المختبرية. حسن الديب ومجدى ولسن، معهد بحوث وقاية النباتات، الدقي، مصر، البريد الإلكتروني: magdy_wilson2000@yahoo.com
أجريت دراسة على الإستهلاك اليومي والتفضيل الغذائي لخفاش الفاكهة المصري *Rousettus agyptiacus* لخمس عشرة نوعاً من المواد الغذائية باستخدام طرق التغذية الإيجابية والتغذية الإختيارية. أظهرت النتائج أنه تحت ظروف التغذية الإيجابية سجلت ثمار الطماطم/البندورة والجوافة والتين أعلى استهلاك وأفضلية للخفاش، بينما سجلت ثمار الفاصولياء والكوسة والزمان أدنى تفضيل. وتحت ظروف التغذية الإختيارية لمجموعة ثمار الفاكهة، كانت ثمار الجوافة هي الأعلى استهلاكاً وأفضلية تلاها ثمار كل من العنب والتفاح، بينما كانت ثمار المانجو، البلح الأحمر والأسود متوسطة الإستهلاك والأفضلية للخفاش. وسجلت ثمار الطماطم/البندورة أيضاً أعلى استهلاك وأفضلية من بين مجموعة ثمار الخضر مقارنة مع باقي المجموعة ضعيفة الأفضلية والإستهلاك. أوضحت الدراسة أن خفاش الفاكهة المصري يهاجم الأنواع المختلفة من ثمار الفاكهة والخضر ويسبب خسائر مختلفة تبعاً لنوع النبات.

RO 7

كثافة التوزيع اليومي للعصفور الدوري الهجين *Passer domesticus* X *Passer hispaniolensis* في حقول القمح القاسي. نسيمه بهيج بن يونس¹ وصالح الدين دومنجي². (1) دائرة البيولوجيا، كلية العلوم جامعة بومرداس، الجزائر، البريد الإلكتروني: behidj_nassima@yahoo.fr؛ (2) مخبر علم الطيور دائرة علم الحيوان الزراعي والغابي، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر.

توضح النتائج الحالية التوزيع اليومي لهجوم الطائر الدوري الهجين *Passer domesticus* x *Passer hispaniolensis* على سنابل القمح القاسي (*Triticum durum*) في 4 حقول خلال شهري نيسان/أبريل وأيار/مايو، إذ يتم خلال هذين الشهرين تكون ونضج حبات سنابل القمح. بلغ عدد طيور الدوري الهجين التي هاجمت حقول القمح 1، 2، 3 و 4 خلال شهر أيار/أبريل المعدلات 45.6، 42.3، 16.6 و 8.3 طيراً، على التوالي. بينما كان تردد الطيور أعلى خلال شهر أيار/مايو، حيث بلغ معدلها 80.2، 49.8، 38.3 و 17 طيراً، على التوالي. كان عدد أفراد الطائر الدوري الهجين التي شوهدت في الحقول صباحاً أقل من عدد الأفراد التي لوحظت مساءً.

RO 8

تعريف الطيور الضارة التي تهاجم محصول عباد الشمس في إيران وتقدير معدلات الضرر وأشكاله. أبو القاسم خالقي زاده¹. سليمان خورمالي²، عبد العلي إصباح بودي³، إسمايل علي زاده⁴ وأمير حسين كوجه باغي⁵. (1) مخبر علم الطيور، قسم علم الحيوان الزراعي، معهد بحوث آفات وأمراض النباتات، إيران، البريد الإلكتروني: akhaleghizadeh@yahoo.com؛ (2) مراكز البحوث الزراعية في شرق أذربيجان؛ (3) غولستان؛ (4) مازاندران؛ (5) قوم.

الطيور من الآفات المهمة التي تواجه زراعة عباد الشمس في إيران. أجري هذه المسح خلال العامين 2002-2003 في عدة مناطق في إيران هي: مازاندران، جولستان، طهران، قم وخوي. اعتماداً على سلوك التغذية للطيور لوحظ وجود ثمانية أنواع من الطيور تهاجم البذور الناضجة في أقراص عباد الشمس. تنتمي الأنواع الثمانية الضارة إلى أربعة فصائل. فصيلة Columbidae، وتمثلت بطائر الحمام الصخري *Columba livia* وخاصة في منطقتي كارجي وقم، بالإضافة إلى طائر حمام القباب *Streptopelia turtur* وخاصة في منطقة غونباد. فصيلة Fringillidae تمثلت بطائر الحسون الأوروبي *Carduelis carduelis* وخاصة في منطقة غوليداغ، والعصفور الدوري *Passer domesticus* خاصة في مناطق كارج، قم، خوي، غونباد و مازاندران. الفصيلة Corvidae تمثلت بالغراب مبقع الذيل *Pica pica* خاصة في منطقة كارج والغراب العادي *Corvus frugilegus* في منطقتي كارج وخوي، والغراب ذو القلنسوة في *Corvus corone* في منطقة كارج. في هذه الدراسة تم اختيار 2936 قرص من عباد الشمس بطريقة عشوائية وتم تقييم الضرر في كل من الحقول الزراعية وفي الحقول التجريبية لمحطات البحوث. في الحقول الزراعية كان الضرر منخفضاً (0.98%-3.62%)، بينما في الحقول التجريبية كان الضرر مرتفعاً؛ 43.5% في حقول محطة كارج و 24.6% في حقول محطة خوي. تم دراسة عدد من القياسات المورفولوجية/الشكلية؛ ارتفاع قرص عباد الشمس عن سطح التربة (سم)، قطر القرص (سم)، معدل قطر القرص إلى قطر المنطقة العقيمة في وسط القرص (%، زاوية القرص، شكل القرص وشكل الساق، عند تحليل معدلات الضرر. ودرس الارتباط من أجل العوامل الثلاثة الأولى في حين استخدم تحليل التباين من أجل العوامل الثلاثة التالية. كان الارتباط معنويًا فقط من أجل قطر المنطقة العقيمة وسط القرص ($P < 0.01$). أظهر تحليل التباين وجود اختلافات معنوية بين المجموعات التي تختلف فيها زاوية القرص ($P < 0.01$) و شكل القرص وشكل الساق ($P < 0.05$). واستناداً إلى النتائج الحالية فإن أصناف عباد

للاستخدام من مبيد البروديفاكوم (مضغوطات بقطر 2 مم تحتوي المادة الفعالة بتركيز 0.005%) ومبيد فوسفيد الألمنيوم (أقراص بوزن 3 غ تحتوي المادة الفعالة بتركيز 56%). عوملت الجحور الفاعلة في معاملات فوسفيد الزنك والبروديفاكوم بإضافة 10 غ من الطعوم السامة لكل جحر. وفي معاملة فوسفيد الألمنيوم عومل كل جحر فاعل بقرص واحد من المستحضر التجاري. فُذرت فاعلية المعاملات بالإعتماد على عدد الجحور الفاعلة قبل المعاملة وبعدها. وأثبتت النتائج المتحصل عليها انخفاض متوسطات عدد الجحور الفاعلة في معاملات فوسفيد الزنك، فوسفيد الألمنيوم، البروديفاكوم والشاهد غير المعامل وذلك بنسبة 95.9، 91.9، 81.9 و 18.5%، على التوالي. لم تظهر فروق معنوية بين فاعلية فوسفيد الزنك وفوسفيد الألمنيوم، في حين كان الفرق معنويًا بين كل منهما مع مبيد البروديفاكوم. ظهرت أعراض التسمم السريع غير المباشر على المفترسات الثديية بعد 24 ساعة من المعاملة بمبيد فوسفيد الزنك، مما قد يشير إلى ضرر المبيد على الأعداء الحيوية برغم فعاليته العالية. كما تشير النتائج إلى أن إضافة واحد غرام فقط من طعوم فوسفيد الزنك في كل جحر فاعل تبدو كافية لتحقيق فعالية عالية في مكافحة الجرد الليبي مقارنة بتلك الناتجة عن إضافة 10 غ في الجحر.

RO 4

دراسة تأثير المبيد الحشري كلوربايروفوس في إحداث التشوهات الخلقية في الجرذان البيضاء. افضيل عمر العوامي وزينب مختار، قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، ليبيا، البريد الإلكتروني: ghariani99@yahoo.com نفذت هذه الدراسة لمعرفة تأثير المبيد الحشري الفوسفوري العضوي كلوربايروفوس "الدورسيان" في إحداث التشوهات الخلقية في أجنة الجرذان البيضاء. أجريت الإختبارات على إناث من السلالة المخبرية البيضاء للجرذ النروجي (*Rattus norvegicus*). لدراسة التشوهات الخلقية تم تجريع المبيد للجرذان الحوامل بعد تحديد اليوم الأول من الحمل واستخدم المبيد في جرعتين هما 1.0 مغ/كغ (NOEL) و 7.1 مغ/كغ ($1/10 LD_{50}$) بمعدل 20 أنثى حامل/جرعة. عند اليوم الـ 21 من الحمل تم قتل الحيوانات في المجموعات المعالجة وإناث الشاهد غير المعامل. استخرجت أرحامها لفحص مواقع الإنغراس والأجنة الممتصة والكشف عن حيوية الأجنة المكتملة ثم أخذت الأجنة وتم وزن كل منهما، ثم فحصت الأجنة شكلياً. أظهرت النتائج أن الجرعة المميتة النصفية لمبيد كلوربايروفوس "الدورسيان" لإناث الجرذان كانت 70.7 مغ/كغ من وزن الجسم. في دراسة التشوهات الخلقية لم تلاحظ أي أعراض تسمم على الأمهات في المجموعتين المعالجتين بمبيد الدورسيان وكذلك لم يظهر أي نقص في حيويتها أو نشاطها. أظهرت الدراسة وجود حالات تحلل كامل للأجنة عند الجرعة المرتفعة فقط المطبقة على الأمهات الحوامل وكذلك حدوث تشوهات شكلية في أجنة الجرعة المنخفضة؛ كبروز الدماغ وتشوه الرأس. كما لوحظ وجود نقص معنوي في وزن الأجنة بالمجموعتين المعالجتين مقارنة مع مجموعة الشاهد غير المعامل. أوضحت نتائج فحص أحياء الأجنة حدوث تشوهات في الأعضاء الداخلية ظهرت على هيئة اتساع الفص الثالث بالمخ واتساع المنخران وكذلك صغر مقلة العين ظهر عند الجرعة المنخفضة فقط بنسبة وحالات ضمور بالرئة عند الجرعة المنخفضة وتضخم بالقلب وضمور الكبد بنسبة عند الجرعتين المنخفضة والمرتفعة على التوالي. كما ظهر اتساع بالحوض الكلوي. ولم تظهر أي تشوهات على أجنة إناث مجموعة الشاهد غير المعامل.

RO 5

حصر أولي للخفاشيات في سورية. عدوان شهاب وإبراهيم مام خير، إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية. دوما، ص. ب. 13، دمشق، سورية، البريد الإلكتروني a.shehab@mail.sy أجري مسح حقل خلال العامين 2004-2005 للتحقق من أنواع الخفاشيات الموجودة في البيئات السورية. اعتمدت نتائج المسح على عينات من خفاشيات حية جمعت من مواقع مختلفة؛ كهوف ومناطق أثرية وأبنية مهجورة، كما استخدمت بقايا عظام الخفاشيات التي وجدت في لقيات البوم. تم تسجيل 16 نوعاً من الخفاشيات هي: الخفاش النضوي الكبير (*Rhinolophus ferrumequinum*)، خفاش البحر المتوسط النضوي (*Rhinolophus Euryale*)، الخفاش النضوي الصغير (*Rhinolophus hipposideros*)، خفاش بيتر النضوي (*Rhinolophus blasii*)، خفاش شرابير طويل الجناح (*Miniopterus schreibersii*)، الخفاش النمساوي الرمادي طويل الأذن (*Plecotus austriacus*)، الخفاش الكبير فاري الأذن (*Myotis myotis*)، الخفاش الصغير فاري الذيل (*Myotis blythii*)، الخفاش طويل الأصابع (*Myotis capaccinii*)، خفاش جيفري (*Myotis emarginatus*)، الخفاش ثلاثي الوريقات الأنفية (*Asellia tridens*)، خفاش هيمبرتش طويل الأذن (*Otonycteris hemprichii*)، خفاش كهل (*Pipistrellus kuhlii*)، الخفاش عاري البطن (*Taphozous nudiventris*)، خفاش بوتّا (*Eptesicus bottae*)، خفاش الفاكهة المصري (*Rousettus aegyptiacus*). أظهرت نتيجة المسح الحقل وجود نوعين من الخفاشيات يسجلان للمرة الأولى من سورية. جميع الخفاشيات المسجلة من سورية باستثناء خفاش الفاكهة المصري هي أنواع تتغذى على الحشرات وهي بذلك كائنات مفيدة ولها دور مهم بوصفها أعداء حيوية للحشرات.

RO 1

دراسات بيئية على الخلد الأعمى *Spalax ehrenbergi* في منطقة الجبل الأخضر بالجماهيرية الليبية العظمى. مجدي ولسن¹، حسن الديب¹، طلعت عيسى² وحواء محمد³. (1) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، القاهرة، مصر، البريد الإلكتروني: magdy_wilson2000@yahoo.com؛ (2) كلية الدراسات العليا جامعة وادي النيل، السودان؛ (3) كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا.

أجريت سلسلة من الدراسات البيئية على الخلد الأعمى *Spalax eherbergi* الشائع في الحقول الزراعية بالجبل الأخضر في ليبيا، وهو قارض يعيش حياة انفرادية في جحور يحفرها تحت سطح التربة. وبعد الخلد من الآفات التي تسبب خسائر اقتصادية في المحاصيل والفاكهة في هذه المنطقة. أظهرت النتائج أن أطوال الممرات (الأنفاق تحت سطح التربة والمؤدية للجحور) تباينت باختلاف النظام البيئي للمنطقة. وعموماً تراوح طول الممر من 22.8 إلى 64.3 م في جميع مناطق الدراسة، وتؤدي هذه الممرات إلى غرف تخزين الطعام وغرف معيشة وغرف التعشيش. اختلفت أبعاد الكومة الرئيسية للجحر تبعاً للطبيعة الفيزيائية للتربة، واختلف عدد الأكوام الفرعية حسب نوع المنطقة، فقد سجلت أعلى عدد في الأراضي البستانية وأراضي الحقول الزراعية، حيث سجلت 14 و 12 كومة/الجحر الواحد بينما كانت 10 و 9 كومة/الجحر في أراضي الغابات والأراضي البور، على التوالي. كما اختلفت عدد غرف تخزين الطعام حسب المنطقة، وعموماً تراوحت ما بين 3-4 غرف/الجحر، واختلف عدد جحور الخلد الفاعلة باختلاف منطقة الدراسة. كما أوضحت الدراسة أن الغذاء الشائع للخلد هو درنات البطاطا/البطاطس والبصل كنباتات تنمو تحت سطح التربة، وثمار البرقوق والتين كثمار فاكهة. واختلف الغذاء المخزن حسب البيئة المحيطة بالخلد، إذ وجدت درنات البطاطا/البطاطس والبصل وكذلك حبوب القمح والشعير والذرة في الجحور التي في حدائق الفاكهة. بينما وجدت درنات البطاطا/البطاطس وحبوب القمح والشعير والذرة وثمار الزيتون في منطقة المحاصيل الحقلية. كما سجلت درنات البطاطا/البطاطس والبصل وجذور بعض النباتات وحبوب الشعير فقط في منطقة الغابات. بينما كان الغذاء المخزن في جحور الخلد في المناطق البور يتألف من درنات البطاطا/البطاطس وحبوب القمح والشعير وثمار الزيتون والتين.

RO 2

التغيرات النسيجية المرضية الناتجة عن تجرع المبيد الحشري كلوربايروفوس على الجرذان البيضاء. إبراهيم سالم حسين¹، أفضل عمر سالم العوامي²، غياث صالح محمود³ وفهيم عبد الكريم بن خيال⁴. (1) قسم علم الحيوان، كلية آداب وعلوم المرج، جامعة قارونس، ليبيا؛ (2) كلية الزراعة، جامعة عمر المختار؛ (3) كلية الطب البيطري، جامعة عمر المختار؛ (4) قسم الصناعات الغذائية، كلية الزراعة، جامعة عمر المختار، ليبيا، البريد الإلكتروني: ghariani99@yahoo.com

هدفت الدراسة إلى معرفة تأثير المبيد الحشري كلوربايروفوس تجريبياً في أنسجة الأعضاء الداخلية للجرذان البيضاء. استخدم لهذا الغرض 110 ذكور من السلالة المخبرية البيضاء للجرذ النروجي (*Rattus norvigicus*). قسمت الجرذان المختبرة إلى أربع مجموعات، وخصصت المجموعة الأولى لتحديد الجرعة المميتة النصفية (LD_{50}) التي تبين أن مقدارها 81.2 مغ/كغ من وزن جسم الذكور. أعطيت المجموعة الثانية من الجرذان جرعة يومية مقدارها 10/1 من قيمة LD_{50} . وأعطت المجموعتين الثالثة والرابعة جرعة واحدة مقدارها 10/1 و 30/1 من قيمة LD_{50} ، على التوالي. أظهر الفحص النسيجي المرضي احتقان الأوعية الدموية لمعظم الأعضاء مع وجود باحات نزفية ونخرية تحت محفظة الكبد والطحال والكلية وتحت غشاء الجنب للرئة، كما لوحظ النفاخ الرئوي للأسناخ الرئوية مع وجود القوالب الزجاجية في أسناخ أخرى للرئة. لوحظ خضاب الهيموسيدرين في أنسجة الكبد والطحال والكلية. أما أنسجة القلب والأمعاء فقد اتسمت بوجود بؤر نخرية وارتشاح بالكريات الدموية الحمراء والخلايا اللمفية، كما لوحظت القوالب الزجاجية في تجاويف الأنبيبات الكلوية أيضاً. لوحظ في أنسجة الخصي نخر شديد وتوقف عملية تكوين النطاف. أما الدماغ فكان يعاني من الارتشاح الليمفاوي الشديد والتهاب أغشية السحايا عند معظم الحيوانات المختبرة.

RO 3

الأداء الحقلية لثلاثة من مبيدات القوارض في مكافحة الجرذ الليبي *Meriones libycus* في سورية. إبراهيم مام خير¹، فوزي سماره² وعدوان شهاب¹. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: mamkher@hotmail.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، ص.ب. 30621، سورية.

أجريت تجربة حقلية، لتقييم الأداء الحقلية لثلاثة من مبيدات القوارض (فوسفيد الزنك، البروديفاكوم، فوسفيد الألمنيوم) في مكافحة مستعمرات الجرذ الليبي *Meriones libycus* في مناطق شبه جافة شرقي دمشق وجنوب شرق حمص خلال شهر شباط/فبراير 2005. تم التطبيق باستخدام طعوم فوسفيد الزنك (حبوب القمح مع المادة الفعالة بتركيز 2%)، والطعوم الجاهزة

القوارض والطيور

السورية في ظروف مدينة دمشق، من أجل تحديد الوقت المناسب للمكافحة. أظهرت النتائج ازدياد معدل تكاثر مجتمع الفاروا بصورة كبيرة خلال فصل الربيع، ولوحظ أيضاً اختلاف معدل التساقط الطبيعي اليومي للخلية الواحدة من فترة لآخرى. ويبدأ معدل تكاثر الطفيل بالارتفاع اعتباراً من نهاية أيلول/سبتمبر، وتكون أعداد الطفيل مرتفعة في شهر تشرين الثاني/نوفمبر وكانون الأول/ديسمبر تبعاً للظروف المحيطة.

BI 11

التأثيرات التغذوية لأوراق التوت المزود بفيتامين "الرايبوفلاين" في الصفات الحياتية والإقتصادية لدودة الحرير *Bombyx mori* L. روح الله رجبى¹، رحيم عبادي¹، محمد فضيلتي² وسيد ضياء الدين مير حسيني³. (1) قسم وقاية النبات، جامعة أصفهان للتكنولوجيا، أصفهان، إيران؛ (2) قسم علم الأغذية، جامعة أصفهان للتكنولوجيا، أصفهان، إيران؛ (3) قسم علم الحيوان، كلية الزراعة، جامعة جويلان، رشت، إيران، البريد الإلكتروني: r_r_iut_msc@yahoo.com

تمت دراسة إضافة "الرايبوفلاين" على نمو وصفات شرنقة دودة الحرير *Bombyx mori* L. (Lepidoptera: Bombycidae). تم تغذية اليرقات بأوراق التوت المعاملة "بالرايبوفلاين" مرة واحدة باليوم. تم نقع الأوراق بالمحاليل المحضرة لمدة 15 دقيقة و تم جففت بالهواء ثم أطحمت لليرقات من الطور الأول إلى الثالث. واطعم الطور الرابع والخامس بأوراق مرشوشة بالمحاليل من كل تركيز. وقد تم استعمال أوراق توت غير منقوعة ولا مرشوشة بالمحاليل كشاهد للتجربة. وقد تم تسجيل كل العوامل الإقتصادية والحياتية وفق المعايير المتبعة في علم صناعة الحرير. وكان أكبر وزن لشرنقة الذكر والأنثى عند 77 جزء بالمليون (1.195 غ) وعند 127 جزء بالمليون (1.622 غ). وكان أكبر وزن لعنقاء الذكر والأنثى عند 37 جزء بالمليون (0.895 غ) وعند 127 جزء بالمليون (1.169 غ). زاد وزن القشرة للذكر والأنثى معنوياً عند 77 جزء بالمليون بـ 0.311 و 0.318 غ بالمقارنة مع الشاهد (0.276 و 0.277 غ). كانت أعلى نسبة زيادة لقشرة الذكر والأنثى عند 77 جزء بالمليون، وبلغت 26.06% و 21.46%، على التوالي. يمكن الإستنتاج من النتائج ضرورة تزويد أوراق التوت "بالرايبوفلاين" يمكن استعماله بتركيز 77 جزء بالمليون لتحسين الصفات الإقتصادية لدودة الحرير.

BI 7

دراسة تأثير العوامل المناخية في فاعلية النحل البري المربي بمنطقة المتيجة. ليلي بن ضيف الله - تازروتي¹، كمال لوادي² وصلاح الدين دومنجي³. (1) قسم البيولوجيا، كلية العلوم، جامعة محمد بوقرة بومرداس، الجزائر، 67 شارع أول نوفمبر، الرويبة، الجزائر، البريد الإلكتروني: bendif_1@yahoo.fr؛ (2) قسم علم الحشرات، جامعة منتوري للعلوم، قسنطينة، الجزائر؛ (3) مخبر أبحاث الحشرات، المعهد القومي للفلاحة، الحراش، الجزائر.

أنجزت الدراسة على النحل البري الانفرادي والاجتماعي والمربي سنة 2003 بحقل التجارب الكائن بالمعهد القومي للفلاحة بالحراش (الجزائر). وقد تم دراسة تأثير عاملي الحرارة والرطوبة في نشاط النحل. أظهرت النتائج أن نشاط هذه الحشرات مترابط ايجابيا مع الحرارة وسلبيا مع الرطوبة. لقد تمت الدراسة على بعض أنواع من النحل وهي: *Apis mellifera* (Haliictida) *Lasioglossum discum* (Andrenidae) *Andrena flavipes* (Apidae) *Bombus terrestris* (Anthophoridae) *Anthophora atripes* (Megachilidae) *Osmia* sp. تمت دراسة تأثير هذين العاملين على النحل بواسطة عامل الربط الخطي أو المستقيم (r). أسفرت النتائج أن الحد الأدنى لنشاط *Apis mellifera* يكون عند درجة حرارة 8°س و 60% رطوبة. أما بالنسبة للنحل البري فالحد الأدنى هو بين 11-16°س و 45-60% رطوبة.

BI 8

دراسة تأثير بعض المغذيات الصناعية (عجينة محلية/عجينة ألمانية) في نشاط نحل العسل الإيطالي *Apis mellifera Ligustica* بمنطقة طرابلس في ليبيا. صلاح انبية¹، سليمان أبو سيف¹، الهاشمي اغليو². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، طرابلس، ليبيا، البريد الإلكتروني: najla_elzaidi@yahoo.com

أجريت دراسة لإختبار تأثير نوعين من المغذيات الصناعية (عجينة محلية وعجينة ألمانية) مقارنة بالشاهد (دون استخدام أي نوع من المغذيات الصناعية) على أربعة صفات لنحل العسل الإيطالي *Apis mellifera Ligustica* (Hymenoptera: Apidae) (مساحة حبوب الطلع، مساحة الحضنة، وزن الخلية، والكثافة العددية لمجتمع النحل في الخلية). استخدم في هذه الدراسة 15 خلية بمعدل خمسة خلايا لكل معاملة بما فيها الشاهد خلال الموسمين الشتوي والصيفي. أظهرت النتائج أن متوسط مساحة حبوب الطلع لكل من العجينة المحلية والألمانية والشاهد بلغ 8.12، 6.45 سم²، ومتوسط مساحة الحضنة 258، 257.77 و 225.68 سم²، ووزن الخلايا 32.12، 32.25 و 30.41 كغ، ومتوسط الكثافة النحلية 4، 4 و 3.43 قرصا، على التوالي. يبين التحليل الإحصائي للنتائج وجود فروقات معنوية بين الشاهد والعجنتين المحلية والألمانية وعدم وجود فروق معنوية بين العجنتين، وذلك لكل الصفات المدروسة. نستخلص من هذه الدراسة كفاءة الوجبات الصناعية في تغذية النحل.

BI 9

دراسة التأثير التثبيطية لمادة العكبر في عدد من الجراثيم الموجبة والسالبة لصبغة جرام. محمود عبد الجبار الطوبجي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: altobje@yahoo.com
تم في هذه الدراسة تحديد التأثير التثبيطي لمادة العكبر التي تعد أحد منتجات النحل المهمة، إذ درس تأثيرها ضد بعض أنواع من البكتيريا الموجبة (*Staphylococcus*، *Streptococcus*، *Enterococcus*) والسالبة صبغة جرام (*Escherichia coli*، *Klebsiella*، *Pseudomonas*، *Proteus*، *Salmonella*). أظهرت النتائج امتلاك هذه المادة فاعلية مضادة للبكتيريا *Staphylococcus*، *Streptococcus* و *Klebsiella*. حدد التركيز المثبط الأدنى له على هذه الأنواع من الجراثيم التي أظهرت حساسية له وكان التركيز المثبط الأدنى للنوع *Staphylococcus aureus* هو 2.5 مايكروغرام/قرص ولكل من *Streptococcus* و *Klebsiella* 0.25 مايكروغرام/قرص.

BI 10

دراسة دينامية مجتمع طفيل الفاروا *Varroa jacobsoni* Oud. نور الدين يوسف ظاهر حبيج¹ وعلي خالد البراقي². (1) قسم بحوث الحشرات، إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، ص ب 113، دوما، دمشق، سورية، البريد الإلكتروني: nouraldinz@yahoo.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، ص.ب. 30621، سورية، البريد الإلكتروني: ali-alb@scs-net.org

يعد طفيل الفاروا (*Varroa destructor* Anderson and Trueman, 2000) أكبر مشكلة تواجه النحال في العالم. أجري هذا البحث في منحل ومختبر بحوث نحل العسل في كلية الزراعة بجامعة دمشق (سورية) ومختبراتها، خلال أعوام 2002، 2003 و 2005. هدف هذا البحث إلى دراسة دينامية مجتمع الفاروا خلال فصلي الربيع والخريف على نحلة العسل

BI 4

تأثير بعض المناطق الجغرافية في شمال العراق ضمن محافظة أربيل في عمر شغالات نحل العسل. عمر عبد الرحيم مصطفى¹ ومزاحم أيوب الصانع². (1) قسم وقاية النبات، مديرية زراعة أربيل، أربيل، العراق؛ (2) قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: muzahimelsaiegh@yahoo.com
أجريت هذه الدراسة في محافظة أربيل/العراق في أربعة مناطق جغرافية مختلفة الارتفاع عند سطح البحر وهي: خبات (200 م)، أربيل (450 م)، ديانا (740 م) وشقلاوة (970 م)، بدءاً من 2001/10/11 إلى 2002/11/28. تأثرت أعمار الشغالات بارتفاع الموقع عن سطح البحر وارتبطت بالموسم والموقع الجغرافي. كان عمر النحل الفاقس في تشرين الأول/أكتوبر أطول مقارنة بالنحل الفاقس في أيار/مايو الذي كان أقصر عمراً اعتماداً على ارتفاع الموقع الجغرافي. وهكذا بلغ أطول عمر للشغالات 137.76 يوماً في شقلاوة (في التجربة الأولى) وأقصر عمر بلغ 18.91 يوماً في موقع شقلاوة أيضاً في التجربة الرابعة.

BI 5

تأثير العسل والعكبر على عزلتين مختلفتين من البكتيريا النافعة. سراء أبو رداد¹، إبراهيم الناظر²، ومالك حدادين³. (1) كلية الزراعة، الجامعة الأردنية؛ (2) قسم وقاية النبات؛ (3) قسم الأغذية، كلية الزراعة، الجامعة الأردنية، الأردن، البريد الإلكتروني: sraddad@gmail.com
تقوم هذه الدراسة على تقييم أثر ثلاث عينات محلية من العسل وعينة عكبر في نمو وفاعلية عزلتين من البكتيريا النافعة المعزولة محلياً (*Lactobacillus acidophilus* و *Bifidobacterium infantis*) في الحليب خالي الدسم. تم فحص عينات العسل المستخدمة من حيث؛ حموضتها (الرقم الهيدروجيني)، معامل الانكسار، الرطوبة، محتوى المعادن وكميتها. احتوت هذه الدراسة على ثلاث تجارب أساسية؛ أثر العسل، أثر العكبر، وأثر خليط العسل والعكبر. عززت جميع عينات العسل نمو *B. infantis* و *L. acidophilus*. أظهر مستوى 7.5% لجميع أنواع العسل أفضل تأثير في أعداد *B. infantis*، بينما حدث أفضل نمو بالنسبة لبكتيريا *L. acidophilus* عند مستوى 1% لعسل 1 و 2.5% لعسل 2 وعسل 3. وأعطى الشاهد في تجربة العكبر مع *B. infantis* أكبر عدد من البكتيريا مقارنة مع المستويات الأخرى. من جهة أخرى، أعطى مستوى 16% من العكبر أفضل تأثير في بكتيريا *L. acidophilus*. زاد خليط العسل والعكبر من نمو *B. infantis* و *L. acidophilus* مقارنة مع الشاهد. تم فحص الحليب المخمر المنتج من التجارب السابقة لتكوين الأحماض الدهنية قصيرة السلسلة، الرقم الهيدروجيني، نسبة حمض اللاكتيك، والقدرة المضادة لثلاث جراثيم ممرضة. وجد أن الأحماض الدهنية قصيرة السلسلة موجودة بكميات كبيرة. أظهرت هذه الدراسة أن استخدام العسل والعكبر كمحفزات حيوية، له تأثير إيجابي في نمو وفاعلية *L. acidophilus* و *B. infantis*، إضافة للصفات المدعمة لصحة الجهازين الهضمي والمناعي.

BI 6

دور النحل البري الانفرادي والاجتماعي في تأبير النباتات وانتشاره في بعض مناطق شمال الجزائر. ليلي بن ضيف الله تازروتي¹، كمال لوادي² وصلاح الدين دومنجي³. (1) قسم البيولوجيا، كلية العلوم، جامعة محمد بوفرة بومرداس، 67 شارع أول نوفمبر، الرويبة، الجزائر، البريد الإلكتروني: bendif_l@yahoo.fr؛ (2) قسم علم الحشرات، جامعة منتوري للعلوم، قسنطينة، الجزائر؛ (3) مخبر أبحاث الحشرات، المعهد القومي للفلاحة، الحراش، الجزائر.
أنجزت الدراسة على النحل البري الانفرادي والاجتماعي، رتبة غشائية الأجنحة وفوق فصيلة النحل (Hymenoptera: Apoidea) خلال 3 سنوات من 2003 إلى 2005 في مناطق مختلفة في شمال الجزائر (المتيجة الشرقية، بومرداس وبويرة). أجري الحصر لمعرفة وتحديد أجناس الحشرات النافعة مع دراسة دورها في تلقيح النباتات البرية والمزروعة. تم التعرف في الوسط الطبيعي على قائمة مهمة من 107 أنواع موزعة على 14 جنسا و 5 عائلات. فكانت عائلة Halictidae موجودة بأعلى نسبة (40.6%) تلتها عائلة Andrenidae (35%)، ثم عائلة Anthophoridae (14.4%)، والعائلة Megachilidae (8.7%) وأخيرا العائلة Apidae (0.54%). كما وجد عددا من الأنواع وتحت الأنواع التي لم يكن قد أشير إليها في بداية القرن، منها: *Anthophora atriceps* Perez, 1763 و *Lasioglossum (Lasioglossum) discum* Smith, 1853 تحت النوع *Aegyptiellum*. وأثبتت النتائج أن للنحل الانفرادي دور مهم واستثنائي في التأبير فوق نحل العسل *Apis mellifera*.

BI 1

أثر تأثير نحل العسل (*Apis mellifera* L.) لأزهار اليانسون (*Pimpinella anisum* L.) في زيادة المحصول وتحسين نوعيته. أنس خنشور وعلي البراق، قسم وقاية النبات، كلية الزراعة، ص.ب. 30621، جامعة دمشق، دمشق، سورية، البريد الإلكتروني anaskhanshour@yahoo.com

أجريت هذه الدراسة على نبات اليانسون (*Pimpinella anisum* L.) في حقل منحل بحوث نحل العسل التابع لكلية الزراعة في جامعة دمشق، بهدف دراسة تأثير نحل العسل (*Apis mellifera* L.) للأزهار، وتأثير ذلك في زيادة العقد ووزن المحصول ونوعيته. تم تقدير وزن المحصول المتشكل من جراء زيارة النحل وقورنت بالشاهد الذي غُزل لمنع وصول النحل إليه، فكان معدل وزن البذور المنتجة 219.5 غ/ 2 م² في معاملة التأبير بعدد وافر من النحل مقابل 65.6 غ/ 2 م² فقط في الشاهد. وبينت دراسة نوعية البذور الناتجة، أن البذور التي نتجت عن معاملة التأبير قد ازدادت سماكتها بشكل واضح مقارنة بالشاهد، وكذلك بلغ وزن 100 حبة في معاملة التأبير 0.255 غ مقابل 0.093 غ فقط في الشاهد. ولدى مقارنة متوسط محتوى البذور من الزيت كانت 4.8% في معاملة التأبير، 4.2% في معاملة التأبير المفتوح و 3.2% في الشاهد. أظهر التحليل الإحصائي F-test فروقا معنوية عالية ($P < 0.01$) بين المعاملات والشاهد، سواء بالنسبة لكمية الإنتاج، أو وزن 100 حبة وكذلك محتوى البذور من الزيت. كما تناولت التجربة دراسة سلوك شغالة نحل العسل في جمع الرحيق وحبوب الطلع من أزهار اليانسون. بينت نتائج هذه الدراسة أن وجود نحل العسل في حقول اليانسون وإسهاماته في تأثير الأزهار عامل حاسم، ليس فقط في زيادة العقد، بل وفي تحسين نوعيتها وبخاصة محتواها من الزيت.

BI 2

دور المكملات الغذائية في تحمل الحرارة المنخفضة وفي بعض الخصائص البيولوجية لشغالة نحل العسل. طلال طاهر محمود وزهرة نايف شمدين، جامعة دهوك، كلية الزراعة، العراق، البريد الإلكتروني: taherm47@yahoo.com

أظهرت النتائج أن أعلى معدل لأبعاد فصوص الغدد البلعومية كان 171.0 ميكرونا في التغذية بفيتامين C. وكان أعلى معدل لأبعاد خلايا غدد الشمع 26.73 ميكرونا في الطول و 23.07 ميكرونا للعرض و 27.14 ميكرونا في الطول و 22.06 ميكرونا للعرض في التغذية على فول الصويا أو الحليب الفرز، على التوالي. وكان أعلى إنتاج للشمع والعسل 1817.6 غ / طائفة و 9.92 كغ لكل طائفة مع التغذية بفول الصويا + فيتامين C. وتحملت الشغالات المتغذية على فيتامين C درجات الحرارة 15 °س لمدة 6 أيام و 10 °س لمدة 7 أيام و 5 °س لمدة 5 أيام. وبقيت الشغالات التي غذيت على فول الصويا حية لمدة 15 يوما عند درجة حرارة 15 °س ولمدة 7 أيام عند 10 °س ولمدة 5 أيام عند 5 °س. وتحملت الشغالات التي غذيت على فيتامين C + فول الصويا درجة حرارة 15 °س لمدة 15 يوما، و 10 °س لمدة 8 أيام و 5 °س لمدة 5 أيام. أما تلك التي تغذت على فيتامين C + الحليب الفرز فبقيت حية لمدة 14 يوما عند درجة حرارة 15 °س ولمدة 7 أيام عند 10 °س ولمدة 4 أيام عند 5 °س.

BI 3

الاستخدامات الطبية لبعض منتجات نحل العسل: العسل وسم النحل. عبد السلام أنور محمد، قسم وقاية النبات، كلية الزراعة، جامعة المنيا، المنيا، مصر، البريد الإلكتروني: abdo52@yahoo.com

ساهمت منتجات النحل على مر العصور في مجالات الصحة العامة وساعدت في إثراء الحياة البشرية في الحضارات المختلفة، وما زالت هذه المنتجات تستخدم في "الطب الشعبي" إلى الآن. ويطلق على استخدام منتجات النحل في علاج الأمراض المختلفة مصطلح المداوات بالنحل Apitherapy. ولم يكن لدى الأطباء القدماء الذين وصفوا منتجات النحل لعلاج العديد من الأمراض منذ القدم، أي معرفة بالأسس الطبية والعلمية لتأثيرات هذه المنتجات، ولكنهم اكتسبوا خبراتهم في هذا الشأن فقط من خلال ممارستهم التجريبية لهذه المواد وملاحظة تأثيراتها المختلفة على المرضى. أما الآن فإن أطباء العصر الحديث بصفة عامة لا يعيرون الأدوية التقليدية والشعبية المتعارف عليها سابقا أي اهتمام إلا بعد تفهم واضح لتأثيراتها الطبية أولا. وهناك العديد من الكتابات التي تتناول استخدام منتجات النحل في المجالات الطبية، ولكن الكثير منها يفتقر إلى الدراية العلمية والمهنية. والذي يزيد المشكلة تعقيدا أن التقارير المهنية الدامغة نجدتها مبعثرة خلال نطاق واسع جدا من المجالات العلمية الشاملة، كما أن بعض التفسيرات للتأثيرات الطبية لمنتجات النحل غالبا ما تكون موجودة ضمنا في مقالات بعيدة الصلة عن نحل العسل. لذا فقد كان الهدف من الدراسة المرجعية الحالية هو تجميع مختلف التقارير والأدلة العلمية التي تدعم استخدام منتجات النحل المختلفة في المجالات الطبية المتعددة، وتأكيد الصلة بين خصائص هذه المنتجات من ناحية، واستعمالاتها التطبيقية من أجل رفاهية البشرية وتقديمها من ناحية أخرى.

حشرات نافعة

تختلف فترة نشاط الحشرة الأعظمي باختلاف الأشهر المختلفة من السنة، وتتأثر فاعلية المصائد الفيرومونية بكل من الفيرومون المستخدم وتركيزه، الوقت من السنة، المادة الغذائية المستخدمة، تبديل الفيرومون والغذاء، استمرار وجود الماء، المسافة الفاصلة بين كل مصيدتين، شدة الإصابة في الحقل، توزيع المصائد الفيرومونية، استخدام الكيرمونات وصيانة المصائد.

C 14

تقييم مبيد الفاراس 0.25% بوردرة تعفير (سايبيرمثرين) لمكافحة حشرة بقعة السمسم (*Elasmolomus ordidus*) في السودان. الناير حامد سليمان، محطة بحوث القصارف، مركز بحوث وقاية المحاصيل، هيئة البحوث الزراعية، السودان، البريد الإلكتروني: elnayer15@yahoo.com

يزرع محصول السمسم منذ عدة سنوات في المناطق المطرية كمحصول نقدي ومصدراً للزيوت وكمادة خام لصناعة الكيك والحلويات. ولدية المقدرة على التمدد والتوسع في الإنتاج لمقابلة الطلب المحلي وتقليل استيراد الزيوت. أصبحت مشاكل الحشرات خطيرة نتيجة للتوسع في الإنتاج. ويحتّم ذلك تحسين طرائق الإدارة المتكاملة للأفات الحشرية للحصول على إنتاج عال. تعدّ حشرة بقعة السمسم (الكعوك) *Elasmolomus ordidus* واحدة من أهم الحشرات التي تهاجم محصول السمسم، وهي تهاجم بذور السمسم عند نضج المحصول. أجريت التجارب خلال موسمي 2004/2003 و 2005/2004 في محطة بحوث القصارف (منطقة توابا) ومحطة بحوث حلفا الجديدة. كان أداء مبيد الفاراس 0.25% بوردرة تعفير بجرعة 100 غ منتج للمتر المربع جيداً في مكافحة حشرة بقعة السمسم في محصول السمسم، وبلغت النسبة المئوية لموت الحشرات 90% خلال الموسمين. وكان وزن 1000 حبة (بذرة) 3.1 غ مساوياً للقياسي خلال الموسمين، بينما كان وزن 1000 حبة في حلفا الجديدة 3 غ. وكانت نسبة محتويات الزيت 40.2 و 40.4 في القصارف للموسمين و 40.2 في حلفا الجديدة.

C 15

مقارنة فاعلية بعض المصائد والمواد الجاذبة في صيد ذبابة فاكهة البحر الأبيض المتوسط *Ceratitis capitata* Wiede في سورية. ماجدة مفلح¹ ومحمد أحمد². (1) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية باللاذقية، اللاذقية، سورية؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: magdamofleh@yahoo.com

بينت نتائج مقارنة عدة مواد جاذبة لذبابة فاكهة البحر الأبيض المتوسط *Ceratitis capitata* Wiede (Diptera: Tephritidae) باستخدام مصائد رطبة "فيرمون + هيدروليزات" أن المعاملة TMLcap تفوقت على بقية المعاملات، سواء في كمية الحشرات المنجذبة أو في استمرار الجذب، وعند مقارنة مستحضرات مختلفة من فيرمون "Trimedlure" باستخدام مصائد جاكسون الجافة، تفوقت المعاملة "TML115A" على بقية المستحضرات. لم يعبر لون المصيدة عن اتجاه عام يشير إلى تفوق لون أو أكثر في المستحضر الواحد ولكن رجحت كفة اللونين الأصفر والأخضر الغامق في أغلب المستحضرات. كما أن مستحضرات "Trimedlure" جميعها تجذب الذكور فقط، أما الإناث فقد انجذبت إلى هيدروليزات البروتين بنسبة أكبر، وكذلك للمصائد الحاوية على الماء فقط. وعلى الرغم من أن المستحضر "Biolure" مادة جاذبة على أساس غذائي، إلا أنه لم يجذب سوى أعداد قليلة من الحشرات الكاملة. استمرت فاعلية مستحضرات "Trimedlure" المختلفة المستخدمة 4-6 أسابيع.

C 16

مكافحة سوسة النخيل الحمراء *Rhynchophorus ferrugineus* Oliv. باستخدام الفيرومونات التجميعة. أحمد حسين السعود ومبارك علي القصيلي المنصوري، قسم وقاية النبات، الإدارة العامة لزراعة أبو ظبي، أبو ظبي، ص.ب. 263، الإمارات العربية المتحدة، البريد الإلكتروني: ranahm58@hotmail.com

تعد سوسة النخيل الحمراء *Rhynchophorus ferrugineus* Oliv. (Coleoptera: curculionidae) من أهم وأخطر الحشرات التي تصيب أشجار النخيل في معظم مناطق زراعته في العالم. بينت التجارب التي أجريت في دولة الإمارات العربية المتحدة خلال الفترة ما بين حزيران/يونيو 2003 ولغاية تموز/يوليو 2004 حول دور المصائد الفيرومونية في مكافحة هذه الحشرة، أن استخدام المصائد الفيرومونية التجميعة أعطت نتائج جيدة في مكافحة هذه الآفة من خلال تجميع أعداد كبيرة منها ومنعها من التكاثر وزيادة شدة الإصابة ونشرها في مناطق جديدة. وتفيد المصائد الفيرومونية في تحديد أماكن انتشار الحشرة، وفترات نشاطها على مدار العام. تفيد هذه المعطيات، في وضع الخطط اللازمة لمكافحة سوسة النخيل الحمراء والحد من أضرارها، وتقييم فاعلية عمليات مكافحة المتبعة. بالإضافة لذلك، فإن هذه الطريقة لا تسبب أية أضرار للبيئة وللقائمين عليها، كما أنها رخيصة الثمن وسهلة التطبيق. وبينت النتائج فاعلية التراكيز 200، 400 و 700 مغ من الفيرومون 4-Methyl-5-Nonanol 90%+4-Methyl-5-Nonanol 10% في تجميع أعداد كبيرة من الحشرة، وتفوقت التراكيز 400 و 700 مغ على التركيز 200 مغ، ولم تلاحظ أية فروق معنوية بين بقية المعاملات والشاهد. فقد تم جمع 184، 269، 308 و 277 حشرة لكل تركيز من التراكيز الثلاثة والشاهد، على التوالي. كما تم جمع 1038 حشرة خلال هذه الفترة (سنة) منها 403 ذكور و 635 أنثى. وبينت النتائج أن ليس للحشرة فترة بيات شتوي، فهي تتواجد على مدار العام، وتتشط بشكل كبير خلال فترتين من السنة الأولى في شهري آذار/مارس ونيسان/أبريل والثانية في فترة أيلول/سبتمبر وتشرين الأول/أكتوبر.

68.3، 44.2 و 28.3%، وعلى الحوريات 68.2، 58 و 42.3% بعد مرور 3، 4، 7 أيام، على التوالي. وقد تبين بأن الزيوت ذات اللزوجة ما بين 12-14 سيليست كانت أفضل في تأثيرها ضد بيوض وحوريات ذبابة الياسمين البيضاء مقارنة بالزيوت منخفضة اللزوجة.

C 11

طريقة جديدة لمكافحة دودة ثمار الفستق (*Recurvaria pistachicola* (Danil.) في منطقة الموصل. محمد عبد الكريم الحياي، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: nbl_mstf@yahoo.com
نفذت الدراسة في حقل الفستق الواقع في منطقة حاوي الكنيسة بالموصل في بداية شهر أيار/مايو عام 1995 وقبل نزول يرقات دودة ثمار الفستق (*Recurvaria pistachicola* (Danil.) (Lepidoptera: Gelechiidae) إلى الساق الرئيسي للأشجار بغرض السكون. وتم استخدام ثلاث طرائق ميكانيكية جديدة، وذلك بعمل أحزمة بعرض 5 سم من قطع القماش والاترارات وزيت التشحيم ووضعها أعلى الجذع الرئيسي للشجرة عند نقطة النفرع. أشارت النتائج إلى أن معظم اليرقات المصطادة كانت في الأسبوع الثاني والثالث من شهر أيار/مايو ونسبة قدرها 87.07%. وكانت المعاملة باستخدام القماش أفضل من المعاملات الأخرى، وبلغت نسبة اليرقات المصطادة 61.60، 39.39 و 0.0% لمعاملات القماش والاترارات وزيت التشحيم، على التوالي. أما بالنسبة لأعداد اليرقات الهاربة (غير المصطادة) قبل مكان المعاملة فإن نسبة كبيرة من اليرقات (76.06%) امتنعت من اختراق زيت التشحيم وتجمعت فوق مكان المعاملة بمسافة 10-15 سم، في حين بلغت نسبة اليرقات الهاربة فوق مكان المعاملة للقماش 6.56% والاترارات 17.37%. وبلغت نسبة أعداد اليرقات الهاربة قبل مكان المعاملة 91.89% ونسبة أعداد اليرقات الهاربة بعد مكان المعاملة 11.8%.

C 12

دراسة تأثير المعاملات الميكانيكية في الحد من انتشار الحشرة القشرية الرخوة (*Exaeretopus tritici* (Williams) في حقول القمح في نينوى، العراق. عزيز رمو البنا، سعاد أرديني عبد الله وسالم جميل جرجس، كلية الزراعة والغابات، جامعة الموصل، البريد الإلكتروني: sarmadamjad2003@yahoo.com
أجريت دراسة ميدانية في حقلين للقمح في محافظة نينوى موبونين بالحشرة القشرية الرخوة للموسم الزراعي 1998/1997 لمعرفة تأثير ثلاثة أنواع من المحارث كمعاملات رئيسية (حفار، مطرحي قلاب وقرصي قلاب) بأربعة مستويات لتكرار الحراثة، حراثة واحدة خلال تموز/يوليو، حراثة متعامدتان في تموز/يوليو، حراثة متعامدتان في تموز/يوليو وأب/أغسطس وأربع حراثة متعامدة بالتتابع في تموز/يوليو وأب/أغسطس، في الكثافة العددية لأكياس البيض للحشرة المذكورة. استخدم تصميم القطاعات العشوائية الكاملة RCBD بثلاث مكررات، وتم توزيع المعاملات داخل القطاع الواحد بطريقة الألوام المنشفة، خصصت الألوام الرئيسية لأنواع المحارث والألوام المنشفة لتكرار الحراثة ومواعيدها. تتلخص أهم النتائج بأحراز المحراث القرصي القلاب تفوقاً معنوياً على بقية المعاملات في إظهار عدد أكبر لمجموع الأكياس السليمة والمتضررة واعتبرت المعاملة الخاصة بالحراثتين المتعامدتين في شهر تموز/يوليو ملائمة فنياً واقتصادياً في الحد من انتشار هذه الحشرة.

C 13

دراسة أولية لمكافحة حشرة بسبلا الزيتون باستعمال الفيولولات الطبيعية. يامنة أكاس¹ واسماعيل الحضرمي². (1) مخبر أبحاث الحشرات، معهد البحث الزراعي، ص.ب. 533، مراكش، المغرب، البريد الإلكتروني: aminaouguas1@yahoo.fr
(2) كلية العلوم السملالية، مراكش، المغرب، البريد الإلكتروني: elhadrami@ucam.ac.ma
اهتمت هذه الدراسة بالعلاقة بين شجرة الزيتون وحشرة بسبلا الزيتون (*Euphyllura olivina*) وبالحوانب التي تساعد في فهم كيفية استجابة شجرة الزيتون للإصابة بهذه الآفة. اهتم الجانب الأول من هذا البحث بتقييم إصابة ثمانية أصناف من الزيتون بهذه الحشرة اعتماداً على معايير عينية، واهتم الثاني في تقييم كفاءة محلول الفيولولات الطبيعية المستخرجة من أوراق الزيتون في حياة الحشرة البالغة. وأظهرت النتائج قابلية إصابة الأصناف الثمانية بنسب متفاوتة. وكانت الأصناف التي تحمل أزهاراً كثيرة تحمل بالموازاة إفرازات بيضاء تعرف بالقطن تغطي الأزهار والأغصان الفتية. ولم يكن للأصناف ذات الأزهار المبكر تأثير مهم في درجة الإصابة إلا إذا كانت الشجرة محملة بثمار الزيتون أو الأزهار كثيرة. وتشير نتائج المعالجة بالفيولولات الطبيعية إلى قتل نسبة تتجاوز 20% من عدد الحشرات البالغة.

C 7

تصميم نموذج لتقدير الحد الحرج الإقتصادي لحشرة حميرة النخيل *Batrachedra amydraula* Meyrick في وسط العراق. رضا صكب الجوراني¹ وخميس عبود الدليمي². (1) كلية الزراعة، جامعة بغداد، بغداد، العراق، البريد الإلكتروني: redha_aljorany@yahoo.com؛ (2) دائرة البحوث الزراعية تكنولوجيا و الغذاء، بغداد، العراق. نفذت الدراسة في بساتين نخيل منطقة الطارمية، محافظة بغداد، العراق، خلال العام 2003 بهدف تحديد الحد الحرج الإقتصادي لحشرة حميرة النخيل (*Batrachedra amydraula* Meyrick) على نخيل التمر (*Phoenix dactylifera* L.) صنف زهدي وخستاوي. تم حساب دالة ضرر الحاصل والعلاقة بين عدد الثمار المتساقطة والنسبة المئوية للثمار المصابة المتساقطة وعدد اليرقات فيها. صمم النموذج لتقدير الحد الحرج الإقتصادي لإصابة الثمار على أساس عدد اليرقات/100 ثمرة متساقطة والنسبة المئوية للثمار المتساقطة المصابة. وجد أن الحد الحرج الإقتصادي كان 3 يرقات، و يرقة واحدة/100 ثمرة متساقطة أو عندما تكون النسبة المئوية للإصابة في الثمار المتساقطة 14.05 و 5.42% لكل من صنف النخيل زهدي وخستاوي، على التوالي. دالة ضرر الحاصل كانت $Y = -0.2768x + 146.45$ للصنف زهدي أما في الصنف خستاوي فقد كانت $Y = -1.7014x + 127.58$.

C 8

بعض جوانب مكافحة الزراعية والميكانيكية لحشرة دبور الحنطة المنشاري (*Cephes pygmaens* L.) في حقول القمح في محافظة نينوى، العراق. سالم جميل جرجيس وعبد الكريم هاشم، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nbl_mstf@yahoo.com. أوضحت نتائج الدراسة الخاصة بالمكافحة الزراعية والميكانيكية لحشرة دبور الحنطة المنشاري (*Cephes pygmaens* L.) (Cepidae: Hymenoptera) أن تعريض أعقاب النباتات المصابة لأشعة الشمس المباشرة ولمدة شهر واحد في فصل الصيف أدى إلى ارتفاع نسبة القتل في اليرقات الساكنة إلى 96.6% بينما أدى تعريضها لدرجات الحرارة المنخفضة والتي تراوحت بين 0-4°س إلى قتل نسبة 70% من اليرقات خلال فترة شهرين. كما أوضحت الدراسة أن لعملية حرق مخلفات النباتات تأثيراً في قتل اليرقات الساكنة بنسبة بلغت 64% في الحقل المحروق في حين كانت نسبة اليرقات الحية 35% مقارنة بالحقل غير المحروق.

C 9

المكافحة الكيميائية لدودة ثمار التفاح (*Cydia pomonella* L.) وتوقيت استخدامها. ابراهيم جدوع الجبوري¹، حسين فاضل الربيعي² وسميرة عودة خليوي². (1) قسم وقاية النبات، كلية الزراعة، جامعة بغداد، العراق؛ (2) وزارة العلوم والتكنولوجيا، مركز البحوث الزراعية والبيولوجية، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: Samirabh85@yahoo.com. أظهرت نتائج التجارب الحقلية الخاصة بتحديد أنسب الأوقات للمعاملة بالمبيدات الكيميائية لدودة ثمار التفاح (*Cydia pomonella* L.)، أن رش المبيدات عند وصول أعداد الذكور الممسوكة بالمصانيد الفرمونية إلى 6 حشرة/مصيدة/أسبوع والمتمثل بـ 45.85 وحدة حرارية متجمعة، قد أدى إلى تقليص معدل نسبة الثمار المصابة لكافة المعاملات إلى 6.78% في الجيل الأول وإلى 0.88% في الجيل الثاني مقارنة بـ 30.6% و 12.5% في معاملي المقارنة، على التوالي. في حين أظهرت نتائج تجارب قياس فاعلية المبيدات الكيميائية في منطقة الطارمية، أن خليط مبيدي منظم النمو الحشري Supracid و Fenoxycarb أعطى أعلى كفاءة في السيطرة على دودة ثمار التفاح، وتم تقليص النسبة المئوية للثمار المصابة للجيل الأول إلى 1% عند مسك المصانيد الفرمونية 6 ذكور/مصيدة/أسبوع. وأعطى خليط مبيدي Fenoxycarb و Supracid نسبة مكافحة عالية بلغت 96.7% في منطقة أبي غريب.

C 10

كفاءة عدد من الزيوت الصيفية ضد ذبابة الياسمين البيضاء على الحمضيات/الموالح (*Aleuroclava jasmine*). حسين علي طه، منتهى صادق حسن، انفال مهدي أحمد ووفاء هادي صالح، الهيئة العامة للبحوث الزراعية بغداد، العراق، البريد الإلكتروني: hu_alani@yahoo.co.uk

اختبرت كفاءة ثلاثة زيوت صيفية مختلفة للزوجة ضد ذبابة الياسمين البيضاء (*Aleuroclava jasmine*) على الحمضيات/الموالح خلال صيف 2005 في منطقة الفحامة ببغداد. بينت نتائج البحث كفاءة الزيت الصيفي ذو الزوجة 12.2 سيليست على البيض وبلغت فاعليته 85، 47.3 و 41.1%، وعلى الحوريات 69، 60 و 43.6% بعد مرور 3، 4 و 7 أيام، على التوالي. وبلغت كفاءة الزيت الصيفي ذو الزوجة 14.5 سيليست على البيض 75.8، 86.2 و 67.5%، وعلى الحوريات 71.4، 62.4 و 45.6%، للفترات السابقة، على التوالي. بينما كانت كفاءة الزيت منخفض للزوجة 6.2 سيليست على البيض

C 4

المكافحة الميكانيكية لحشرة الجعل الإفريقي باستخدام المصائد الضوئية. محمد مسعود عبد الله دودو¹ وعلى رمضان عبد الله الديب². (1) مشروع تساوة لإنتاج البذور المحسنة، مرزق، فزان، ليبيا؛ (2) كلية المعلمين بمرزق، جامعة سبها، فزان، ص. ب. 26، مرزق، ليبيا، البريد الإلكتروني: AS-RMNM@yahoo.com

تعتبر المصائد الضوئية أحد أهم الطرق البديلة المستخدمة في مكافحة الآفات الحشرية التي تطير ليلاً وتتجذب لأنواع معينة ومتفاوتة من الإضاءة. وفي السنوات القليلة الماضية ظهر في المناطق الجنوبية والوسطى من الجماهيرية (ليبيا) نوع جديد من الحشرات هو *Euserica murzka* (Ram, Mas) يتبع رتبة Coleoptera وفصيلة Scarabaeidae والجنس *Euserica*. ولهذا النوع من الحشرات قدرة كبيرة على التكاثر وله جيلان في السنة، أما الآثار الاقتصادية التي تحدثها الحشرة فهي تهاجم أزهار وأوراق العديد من المحاصيل وأشجار الفاكهة، منها نبات علف البرسيم، الملوخية، أشجار التفاحيات والزيتون والنبق. أما اليرقات فتهاجم درنات البطاطس/البطاطا وكل الجذور الوندية المتواجدة تحت سطح التربة مثل جذور اللفت والفجل والجزر. تظهر الحشرة ليلاً بعد غروب الشمس مباشرة ولها خاصية الإنجذاب للضوء لذلك تم إستغلال هذه الخاصية حيث قمنا بإجراء العديد من الأبحاث والتجارب على عدة مصائد ضوئية بأشكال ووضعيات وأنواع إضاءة مختلفة. ويهدف هذا العمل إلى جذب أكبر عدد ممكن من هذا النوع من الحشرات، ونتج عن ذلك تصميم نموذج لمصيدة ضوئية عام 2003 تتلاءم وطبيعة هذه الحشرة. وتتميز المصيدة بسهولة تصنيعها وخفة وزنها وقلة تكلفتها وإمكانية استخدامها في المزارع والأماكن العامة. ومن النتائج المتحصل عليها في منطقة الدراسة كان متوسط عدد الحشرات في المتر المربع بمل فيها اليرقات والعداري والحشرات الكاملة من 60-84 حشرة. أما عدد الحشرات التي تم اصطيادها خلال فترة تواجد الحشرة الكاملة (حوالي 120 يوماً تقريباً) فتراوح ما بين 3118-4992 حشرة في اليوم الواحد. عليه فإن المصيدة تستطيع تحقيق نسبة قتل تصل إلى 62.3-71.3% في الموسم. وتعتبر هذه النتيجة جيدة إذا ما قورنت بطرق المكافحة الكيميائية الأخرى.

C 5

استخدام غاز الأوزون O₃ في مكافحة حشرات المخازن. عماد قاسم، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: e_madk@maktoob.com

يعد غاز الأوزون O₃ من الغازات الفعالة في قتل الأحياء الدقيقة بتركيز منخفضة وكذلك في قتل الحشرات التي تصيب الحبوب المخزونة. أعطى غاز الأوزون نسبة قتل 100% لبالغات (وجميع اطوار الحشرتين بيوض ويرقات وعداري) سوسة الحبوب *Sitophilus granarius* L. وبالغات سوسة الرز *Sitophilus oryzae* L. وبالغات ثاقبة الحبوب الصغرى *Rhizopertha domenicana* بعد تعريضه بتركيز 0.07 غ/م³ ولفترة 5-15 ساعة. فيما أعطى ذات التركيز نسبة قتل 50% لبالغات خنفساء الطحين المتشابهة *Tribolium confusum* Duv وبالغات خنفساء الحبوب المنشارية *Oryzaephilus urinamensis* L. وقتل غاز الأوزون 100% من بالغات سوسة الحبوب وسوسة الرز عند استخدامه بتركيز 1.45 غ/م³ بعد فترة ساعة من التعريض، فيما أعطى بعد فترة تعريض 5-10 ساعات نسبة قتل 100% لبالغات ثاقبة الحبوب الصغرى وخنفساء الطحين المتشابهة وخنفساء الحبوب المنشارية. وكان لتأثير درجات الحرارة 10 إلى 35 °س تأثيراً تصاعدياً في زيادة نسبة قتل بالغات سوسة الحبوب وسوسة الرز بغاز الأوزون، فيما لم يكن هناك فرق معنوي في تأثير رطوبة الحبوب 12 إلى 18% في نسبة قتل بالغات سوسة الحبوب وسوسة الرز بغاز الأوزون.

C 6

فاعلية المصائد المانوية المطعمة بزيوت عطرية في مكافحة جعل الورد الزغبى (*Tropinota squalida* Scop). همام بخيت همام، ومنى عبد الحميد محمد، معهد بحوث وقاية النباتات، شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: dr_homam@hotmail.com

هدفت التجارب إلى إثبات أن الرائحة تلعب دوراً فاعلاً في جذب الحشرات البالغة لجعل الورد الزغبى. تم غرلة ثمانية زيوت عطرية هي (الورد، القرنفل، الفانيليا، الفل، النعناع، الياسمين، التفاح، والخوخ) لتحديد أكثر رائحة مناسبة يمكن استخدامها في المصائد المانوية لجذب الحشرة البالغة لجعل الورد الزغبى. وأمكن ترتيب المصائد المختبرة تنازلياً تبعاً لقدرتها على جذب خنافس جعل الورد الزغبى كالاتي: القرنفل، الفل، الورد، التفاح، النعناع، الياسمين، الفانيليا، الخوخ. وكانت كفاءة الجمع معبراً عنها بالمتوسط اليومي 161.07، 71.00، 49.53، 24.80، 16.53، 14.80، 12.67 و 6.20 خنفسة/مصيدة، على التوالي. أعطت مصائد الماء المطعم بزيت القرنفل نتائج واعدة بأنها الأكثر رائحة مناسبة. واعتبرت مصيدة الماء المطعم بزيت القرنفل مع الجمع اليدوي أكثر طرق العلاج براعة وأماناً لمكافحة الحشرة البالغة لجعل الورد الزغبى على أشجار المشمش.

C 1

استخدام الطاقة المايكروية لمكافحة ثلاث من حشرات منتجات البرغل. اياد يوسف اسماعيل، قسم علوم الحياة، كلية التربية، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: aeadismail@yahoo.com
استخدمت ثلاثة مستويات من الطاقة المايكروية (260، 520 و 780 واط) لمكافحة بالغات خنفساء الحبوب المنشارية *Oryzaephilus surinamensis* (L.) وخنفساء الطحين الحمراء (*Tribolium castenum* (Herbst) وخنفساء الخابرة *Trogoderma granarium* (Evert)، في منتجات محلية للبرغل (الجريش والبرغل والحبية) بواقع ثلاثة أوقات تعريض (1، 1.5 و 2 دقيقة). أظهرت النتائج أن أعلى نسبة قتل كانت في خنفساء الحبوب المنشارية (75.67%) تلتها خنفساء الطحين الحمراء (68.64%) ثم خنفساء الخابرة (66.29%). وفي مستويات الطاقة المايكروية، فإن المستوى العالي (780 واط) أعطى نسبة قتل 100% ثم المستوى المتوسط (99.63%) وأخيراً المستوى المنخفض (10.98%)، أما من حيث نسبة القتل لحشرات الدراسة في منتجات البرغل فكانت أعلاها في البرغل (71.48%) في حين كانت أقلها في الحبية (67.9%). وفي أوقات التعريض، فإن نسبة القتل بلغت 75.18، 68.64 و 66.79%، عند تعريضها لمدة 1، 1.5 و 2 دقيقة، على التوالي. كما وجد أن درجات الحرارة الناتجة عن التجربة كانت متقاربة في الجريش والحبية والبرغل (72.7-69.77°س) في حين كانت في معاملة الشاهد 25.33°س. وفي مستويات طاقة التعريض بلغت درجات الحرارة 87.08°س في المستوى العالي ثم 62.41°س في المستوى المتوسط ثم 31.83°س في المستوى المنخفض من الطاقة المايكروية.

C 2

المساحيق الخاملة لمكافحة حشرات المواد المخزونة في القمح. رياض أحمد العراقي¹ وسالم قاسم النقيب². (1) قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: riyadaliraqi@yahoo.com؛ (2) مركز بحوث البيئة والموارد المائية، جامعة الموصل، العراق.
ان استخدام المساحيق المعدنية الطبيعية الخاملة يعتبر أحد الطرق الجديدة لوقاية الحبوب المخزونة من الإصابة بالآفات الحشرية. اختبرت أربعة مساحيق صخرية محلية ضد أربعة من حشرات المواد المخزونة، وأظهر مسحوق صخر النينفايت كفاءة أكثر من بقية المساحيق المختبرة حيث أعطى أعلى قيم LC_{50} وكانت 0.14، 0.12، 0.06 و 0.08% لكل من خنفساء الطحين المتشابهة (*T. confusum*)، خنفساء الخابرة (*T. granarium*)، خنفساء سورينام (*O. surinamensis*) وثاقبة الحبوب الصغرى (*R. dominica*)، على التوالي. وأظهر مسحوق صخر البينتونايت فعالية أقل وأعطى قيم LC_{50} بلغت 0.74، 0.85، 0.13 و 0.20% للحشرات المختبرة، على التوالي. وكان ترتيب تأثير تلك المساحيق في الحشرات وفق التسلسل الآتي: نينفايت، كاولينايت، مونتوريلونايت وبينتونايت. أظهر مسحوق النينفايت ضد خنفساء سورينام تأثيراً يفوق بمقدار 2.41، 2 و 1.4 مرة مقارنة بتأثيره في خنفساء الخابرة وخنفساء الطحين المتشابهة وثاقبة الحبوب الصغرى، على التوالي. ولذلك فإن استخدام مسحوق النينفايت ممكن أن يعتبر بديلاً ناجحاً عن المبيدات الحشرية لوقاية الحبوب المخزونة من الإصابة بحشرات المواد المخزونة.

C3

الأهمية الاقتصادية من زيادة عدد الرشاشات في مكافحة دودة ثمار الرمان *Ectomyelois ceratoniae* في منطقة المقدادية (ديالى). ناصر عبد الصاحب الجمالي، الهيئة العامة لوقاية المزروعات، بغداد، العراق، البريد الإلكتروني: nassir_aljamali@yahoo.com
نفذت الدراسة في بساتين الرمان في المقدادية/ديالى خلال موسمي 2001 و 2002 وذلك لمعرفة الأهمية الاقتصادية من زيادة عدد الرشاشات الكيماوية بمبيد الأكتليك (Pirimiphos-methyl) 50% مادة فعالة بمعدل 4 سم³/غالون ماء في مكافحة دودة ثمار الرمان (*Ectomyelois ceratoniae* (Lepidoptera: Pyralidae)). أوضحت نتائج الدراسة بأن عدد الرشاشات لأكثر من أربع مرات لم يكن ذو جدوى اقتصادية حيث لم تظهر فروقات معنوية بين نسبة الإصابة في الثمار وعدد الرشاشات من 4-8 إذ بلغت نسبة الإصابة 6.9% في الرشاة السابعة مقارنة في الرشاشات 1، 2، 3، 4، 5، 6 والشاهد، وقد بلغت 22.2، 18.6، 14.57، 11.0، 9.12، 8.1 و 50.7%، على التوالي.

مكافحة الحشرات

BC 61

إستخدام بكتيريا المحيط الجذري للنبات لمكافحة مرض الذبول الفيوزاريومي على القطن وبكتيريا التخطيط على القمح تحت الظروف المخبرية في سورية. صلاح الدين خباز^{1&2}، د. لادالكشمي¹، ف. فالوفاباريداسان¹، بسام بياعة² وأحمد الأحمد². (1) قسم أمراض النبات، مركز دراسات حماية النبات، جامعة تامليل نادو الزراعية، ولاية تامليل نادو، كومباتور 641003، الهند، البريد الإلكتروني: salah_edk@yahoo.co.uk؛ (2) إيكاردا، ص.ب. 5466، حلب، سورية.

جمعت 28 عينة ترابية من أغلب مناطق زراعة المحاصيل في سورية، وتم عزل البكتيريا المضادة لمرض الذبول على القطن الذي يسببه فطر *Fusarium oxysporum* f. sp. *vasinfectum* ومرض تخطط القمح البكتيري الذي تسببه بكتيريا *Xanthomonas translucens* على القمح. وقد ضمت المناطق الزراعية المحاصيل التالية: القمح، القطن، عباد الشمس، البطاطا، الذرة، الشوندر السكري، الثوم، الفصّة، البطيخ، الحمص، البازلاء، العدس، الفول، الشعير. وتم عزل 58 عزلة بكتيرية وتم اختيارها وفقاً لشكل المزرعة، وتم إختبار هذه العزلات ضد المرضين السابقين تحت الظروف المخبرية، ومن بين هذه العزلات تم الحصول على العزلتين SL-22 و SH-16 اللتين أظهرتا نتائج جيدة وذلك بإحداث مناطق خالية من نمو المرض في تجربة الأطباق البترية، وقد تم تحديد العزلة SL-22 على أنها *Bacillus subtilis* والعزلة SH-16 على أنها *Pseudomonas fluorescens* وذلك من خلال الطرائق الشكلية والكيميائية الحيوية والجزئية.

نباتات الباذنجان بعد 10 أسابيع من نموها في تربة ملوثة *M. incognita* والمعاملة بتركيزات مختلفة من بكتيريا الباستوريا (مخلوط من جذور وتربة ملوثة بالبكتيريا). وتم إضافة التربة التي تحمل جراثيم البكتيريا بتركيزات مختلفة (0، 20، 40، 60، 80 و 100%). أوضحت نتائج التجربة الأولى أن أعداد اليرقات المصابة بالبكتيريا ازدادت بازدياد تركيز البكتيريا بالتربة. كذلك نتج عن إضافة البكتيريا خفض معنوي لكثافة وأعداد *M. incognita* بعد مضي ستة شهور من بداية التجربة. وكانت أعداد النيماتودا أقل في الأصص التي تحوي التركيز الأعلى من البكتيريا. وفي نهاية العام الثالث للتجربة، بلغت النسبة المئوية لليرقات المصابة بالبكتيريا والميتة 90% و 100% في الأصص التي تحوي التركيزات الأعلى (11.25 و 15 كغ، على التوالي). أوضحت نتائج التجربة الثانية قدرة البكتيريا على خفض كتل البيض للنيماتودا والعدد الكلي للعقد في الجذور. كذلك كان هناك علاقة خطية سالبة بين تركيز البكتيريا وكتل البيض والعقد الجذرية. وتؤكد هذه الدراسة على أهمية بكتيريا الباستوريا في ضبط وخفض أعداد يرقات نيماتودا تعقد الجذور في التربة بعد فترة زمنية تكفي لزيادة عدد الجراثيم إلى الدرجة التي تمكنها من تحقيق هذا الغرض. ولكن هناك حاجة لعمل دراسات حقلية لتحديد أعداد جراثيم البكتيريا الفعلية الضرورية لخفض أعداد النيماتودا.

BC 59

تأثير بكتيريا التضاد المضافة إلى الكمبوست أو إلى الأسمدة المعدنية في بعض أمراض بادرات القطن. مورييس صبري ميخائيل¹، كامل كمال ثابت¹، ماجي السيد محمد²، منى حنفي محمد قناوي³ و خالد قاسم قاسم⁴. (1) قسم أمراض النبات، جامعة القاهرة، مصر، البريد الإلكتروني: kaldkas5@hotmail.com؛ (2) معهد بحوث أمراض النبات، مركز البحوث الزراعية، الجيزة، مصر؛ (3) معهد بحوث التربة والمياه والبيئة، مركز البحوث الزراعية، الجيزة، مصر؛ (4) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث الزراعية، حماه، سورية.

أدى استخدام بكتيريا التضاد مع كل من الكمبوست أو العناصر المعدنية أو خليطهما إلى انخفاض ملحوظ في شدة الإصابة بأمراض بادرات القطن. كما أدت هذه المعاملة إلى زيادة عدد النباتات السليمة مقارنة بالنباتات المصابة غير المعاملة، باستثناء المعاملة بالبكتيريا *Azospirillum sp.* مع العناصر المعدنية أو مع العناصر المعدنية والكمبوست. كما حققت معاملة كل من البكتيريا *Bacillus subtilis* والبكتيريا *Pseudomonas putida* مع الكمبوست أعلى نسبة بقاء للبادرات وصلت حتى 82.5% مقارنة بالشاهد 42.5%. ولقد أدت بعض المعاملات السابقة إلى زيادة ملحوظة في طول النباتات وكذلك الوزن الجاف والرطب للنباتات مقارنة بالنباتات غير المعاملة في كل من التربة المصابة والسليمة. كما تأثر محتوى التربة والنبات من العناصر الكبرى والصغرى نتيجة استخدام البكتيريا سواء مع الكمبوست أو مع التسميد المعدني، وزادت العناصر الكبرى (نتروجين - فوسفور - بوتاسيوم) في كل من النبات والتربة في معظم المعاملات مقارنة بالشاهد غير المعامل، كما زادت أيضا العناصر الصغرى (منجنيز - زنك - حديد) في التربة والنبات وذلك في بعض المعاملات مقارنة بالشاهد.

BC 60

العلاقة بين العائل وعامل مكافحة الإحيائية لمرض موت بادرات القطن. فاخر رحيم حميد¹، محمد عبد الخالق الحمداني² وفرقد عبد الرحيم عبد الفتاح³، (1) جامعة ديالى، كلية العلوم، ديالى، العراق؛ (2) قسم أمراض النبات، دائرة البحوث الزراعية وتكنولوجيا الغذاء، وزارة العلوم والتكنولوجيا، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: ma_alhamdany@yahoo.com؛ (3) جامعة بغداد، كلية الزراعة، العراق.

درس احتمال وجود علاقة بين عوامل مكافحة الإحيائية والعائل النباتي من خلال اختبار قدرة أربعة عزلات من الفطر المضاد *Trichoderma spp.* وهي TV، T160، T194 و T211 في اختزال ضرر الفطر الممرض *Rhizoctonia solani* على بادرات اصناف القطن كوكر 310 وأشور ولاشانا وتأميم 4959. تضمنت الدراسة كذلك إمكانية اعتماد فاعلية أنزيم البيروكسيداز في أنسجة البادرات المصابة لتحديد تفاعل العائل بدلا من نسب الإصابة. أشارت نتائج مكافحة الإحيائية للفطر الممرض بالعزلات المذكورة وكل من المبيد الأحيائي تحدي والمبيد الكيميائي سلسنت، إلى وجود علاقة واضحة بين العزلة والصنف انعكست في تباين قدرة العزلة الواحدة على مكافحة المرض على الأصناف المدروسة. أعطت العزلات الثلاثة الأولى أفضل النتائج مع الأصناف كوكر 310 ولاشانا وتأميم 4959، على التوالي، بينما فشلت جميع العزلات والمبيد الأحيائي تحدي في أحداث اختزال معنوي للمرض في بادرات الصنف أشور. وعلى الرغم من تماثل النسب المئوية للإصابة في بادرات الصنفين كوكر 310 وتأميم 4959 (50%)، فإن القيم المعبرة عن فاعلية أنزيم البيروكسيداز في الأنسجة المصابة لبادرات هذه الأصناف أشارت إلى وجود تفاعل حساسية عالية للفطر الممرض *R. solani* في الصنف تأميم 4959 فقط، وبلغت الفاعلية 591.50 وحدة أنزيم/دقيقة/غ نسيج طري بالمقارنة مع 211.50 في بادرات الصنف كوكر 310. وبلغ مقدار الزيادة في فاعلية الأنزيم المسجلة في بادرات الصنف تأميم 2.8 مرة بالمقارنة مع بادرات الصنف كوكر 310.

58.33، وبلغت نسب تثبيطها للمرض *F. oxysporum*، *F. solani* و *R. solani* باستخدام العزلات M-30، M-39 و PI-5، وبلغت نسب تثبيطها للمرض 48.83 و 60.87%، على التوالي.

BC 56

تقويم تأثير معيق النمو ككتار ضد الفطريات المسببة لتعفن جذور الباقلاء/الفول تحت الظروف المظلة الخشبية والكشف عن آلية تأثيره في العائل والمسبب. حرية حسين الجبوري، كامل سلمان جبر ومحي الدين أيوب عباس، قسم وقاية النبات، كلية الزراعة، أبو غريب، جامعة بغداد، بغداد، العراق، البريد الإلكتروني: hhaljboor@yahoo.com

أجريت هذه الدراسة في كلية الزراعة/ جامعة بغداد خلال الموسم الزراعي 2001/2000 لتقويم كفاءة معيق النمو ككتار في حماية نباتات الباقلاء من الإصابة بمسببات تعفن جذور الباقلاء تحت الظروف المظلة الخشبية والكشف عن آلية تأثيره في العائل والمسبب. أثبتت النتائج أن معاملة بذور الباقلاء بمعيق النمو ككتار بتركيز 25 مغ/لتر ماء وفرت حماية كافية للبذور من الإصابة بفطريات التربة الممرضة *F. solani*، *F. semitectum*، *Fusarium oxysporum* و *Rhizoctonia solani* وخليط الفطرين *F. solani* و *R. solani*، وحقق رفعا معنويا للنسبة المئوية للإنبات وخفضا معنويا لشدة الإصابة مقارنة بمعاملة المقارنة الملوثة بالفطريات بمفردها. وتراوح النسبة المئوية للإنبات بين 30 و 62.5% والنسبة المئوية لشدة الإصابة 26 و 39%، في حين تراوحت النسبة المئوية في معاملة المقارنة الملوثة بالفطريات بين 22.5 و 57.5% والنسبة المئوية لشدة الإصابة 37 و 56.5%. وأظهرت نتائج التشريح النسيجي لسوق وجذور نباتات الباقلاء المعاملة بمعيق النمو ككتار زيادة سمك الأدمة وسمك جدران الخلايا مقارنة بالنباتات غير المعاملة، كما أظهرت النتائج وجود النخاع في مركز المقطع العرضي للساق في النباتات المعاملة وعدم وجوده في النباتات غير المعاملة، وأدت المعاملة بمعيق النمو إلى زيادة عدد خلايا الخشب واللحاء في الحزم الوعائية.

BC 57

التضاد الحيوي لثلاث عزلات محلية وعزلة أجنبية من فطر *Trichoderma* مع الفطر *Verticillium dahliae* Kleb المسبب لمرض ذبول الزيتون مخبريا. حسين حلاق، بهاء الدين النص وياسر جيس، قسم بحوث الزيتون، ادلب، سورية، البريد الإلكتروني: h-hallak@maktoob.com

يعد مرض ذبول الزيتون المتسبب عن الفطر *Verticillium dahliae* Kleb أحد الأمراض المهمة التي تصيب أشجار الزيتون في سورية وتسبب لها الموت التراجعي. وتعد مكافحة الأحيائية ضرورية لمكافحة الفطر *V. dahliae* حفاظا على سلامة البيئة. أخذت ثلاث عزلات محلية من المنطقة الساحلية (T3، T5 و T9) وعزلة أجنبية TB من فطر *Trichoderma*، وتم إختبار تأثير هذه العزلات في مكونات الفطر *V. dahliae* مخبريا. أظهرت النتائج سيطرة إنتاش أبواغ العزلات المحلية من فطر *Trichoderma* على إنتاش أبواغ الفطر *V. dahliae* بوضعها معا في وسط البطاطا السائلة، وكان تأثير أبواغ العزلة TB ضعيفا، فقد وصلت نسبة إنتاش أبواغ الفطر *V. dahliae* إلى 36% مقارنة مع الشاهد. كما سيطرة نمو الغزل الفطري/ميسيليوم لمزارع عزلات الفطر *Trichoderma* الأربع على نمو غزل/ميسيليوم الفطر *V. dahliae* ومنعه من النمو في الطبق البتري نفسه. كما بينت النتائج تأثير الإطراحات الغازية لعزلات الفطر *Trichoderma* الأربع المختبرة في نمو الفطر *V. dahliae* وتثبيط نمو غزل الفطر/الميسيليوم على المستتبت. وبينت النتائج تأثير إطراحات العزلات T3 و TB في المستتبت على أبواغ الفطر *V. dahliae* ومنعها من الإنتاش وبلغت نسبة إنتاش أبواغ الفطر *V. dahliae* 70% و 95%، أما مع إطراحات السلالتين T9 و T5، على التوالي.

BC 58

خفض أعداد نيماتودا تعقد الجذور *Meloidogyne incognita* باستخدام بكتيريا الباستوريا *Pasteuria penetrans* في أراضي منطقة القصيم، المملكة العربية السعودية. سليمان بن محمد الرحياني، كلية الزراعة والطب البيطري، جامعة القصيم، بريده، ص.ب. 1482، القصيم، المملكة العربية السعودية، البريد الإلكتروني: alreh@yahoo.com

تعد بكتيريا الباستوريا *Pasteuria penetrans* من أهم الأعداء الحيوية المعروفة لنيماتودا تعقد الجذور، وتعتبر نيماتودا تعقد الجذور أهم وأخطر الآفات النيماتودية المنتشرة في أراضي وحقول منطقة القصيم في المملكة العربية السعودية. تم في هذا البحث دراسة تأثير بكتيريا الباستوريا (عزلة من منطقة القصيم) في نيماتودا تعقد الجذور *Meloidogyne incognita* من خلال تجربتين في الصوبة/الدفينة. تم في التجربة الأولى متابعة أعداد يرقات الطور الثاني للنيماتودا (J2) في أصص تحوي 20 كغ تربة تحت ظروف البيوت المحمية لمدة ثلاث سنوات. تم إضافة البكتيريا في بداية التجربة فقط باستخدام تربة ملوثة بها بتركيز مختلفة (0.0، 3.75، 7.5، 11.25 و 15.0 كغ تربة ملوثة لكل أصيص). تم زراعة ثلاثة نباتات بانجنان في كل أصيص ثم لقت هذه النباتات بإضافة 20000 يرقة (J2) من *M. incognita*. وتم في التجربة الثانية حصاد

الأحيائية لفطري المكافحة من بين المستحضرات الأخرى المختبرة. وحقق هذا المستحضر للفطر *T. harzianum* خفضاً معنوياً لمرض ذبول الطماطم/البندورة المتسبب عن الفطر *Rhizoctonia solani* فضلاً عن تحقيق زيادة معنوية في الوزن الجاف للمجموع الجذري والخضري للنباتات. كما أظهر المستحضر نفسه للفطر *P. lilacinus* خفضاً معنوياً لمرض تعقد جذور الطماطم/البندورة المتسبب عن النيما تودا *Meloidogyne javanica* فضلاً عن زيادة معنوية في الوزن الجاف للمجموع الخضري. استناداً إلى هذه النتائج اقترح اعتماد هذا المستحضر لمعاملة التربة بكلا فطري المكافحة الأحيائية.

BC 53

تأثير مستويات مختلفة من الدالة الهدروجينية ودرجة التوصيل الكهربائي في نمو وتبوغ فطريات التريكوثيرما. حمدية زاير علي حافظ، هادي مهدي عيود، نبال خليل موسى، فاطمة حسين جاسم وشفق مهدي عبد، وزارة العلوم والتكنولوجيا، دائرة البحوث الزراعية وتكنولوجيا الغذاء، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: Hamdiazali@yahoo.com
أظهرت نتائج دراسة أثر ثلاثة مستويات من الدالة الهيدروجينية (4، 6 و 8) وثلاث درجات من التوصيل الكهربائي (12.92، 14.30 و 17.8) في معيارين للنمو الفطري (النمو القطري والتبوغ) لأربع وثلاثين عزلة من فطريات التريكوثيرما (*Trichoderma spp.*) على المستنبت الغذائي أكار سكرور مستخلص البطاطا/البطاطس، أن قيمة الدالة الهيدروجينية 6 كانت المثالية لنمو وتبوغ معظم العزلات المدروسة، بينما أظهرت قيمة الدالة 8 انخفاضاً معنوياً في معياري النمو مقارنة بقيمة الدالة 4. كما أظهرت النتائج أن درجة التوصيل الكهربائي 17.8 قد خفضت بصورة معنوية النمو الفطري لفطريات التريكوثيرما وتبوغها مقارنة بدرجة التوصيل الكهربائي 12.92 و 14.30. وتفسر هذه النتائج انخفاض كفاءة المكافحة الحيوية لهذه الفطريات في الأراضي القلوية المالحة.

BC 54

تأثير فوسفات البوتاسيوم ومستخلص البروبليس (صمغ النحل) ورواشح بكتيريا *Bacillus* وفطر *Trichoderma* لمكافحة البياض الدقيقي على الخيار (*Sphaerotheca fuliginea*) تحت ظروف البيوت المحمية التجارية. عبده مهدي محمد مهدي، محمد هارون عبد المجيد، فاتن محمود عبد اللطيف وجمال محمد عاشور، قسم النبات الزراعي، كلية الزراعة، جامعة بنها، مصر، البريد الإلكتروني: abdou_mahdy@hotmail.com

أجريت تجربتان خلال موسمي الربيع والخريف من عام 2003. تم في التجربة الأولى دراسة تأثير فوسفات البوتاسيوم، ومستخلص البروبليس/صمغ النحل، ورشاحة بكتيريا *Bacillus subtilis* وفطر *Trichoderma harzianum*، كل على حدة، أو خلطات من مستخلص البروبليس ورشاحة عاملي المكافحة الحيوية في إنبات أبواغ الفطر *Sphaerotheca fuliginea* المسبب لمرض البياض الدقيقي على الخيار تحت ظروف المختبر. وزعت نباتات الخيار صنف بريمو (عمر 4 أسابيع) في التجربة الثانية إلى ثلاث مجموعات تحت ظروف البيوت المحمية التجارية. تم رش نباتات المجموعة الأولى بمحلول فوسفات البوتاسيوم بتركيز 50، 75 و 100 ملليمول، ونباتات المجموعة الثانية بمستخلص البروبليس بتركيز 5000 جزء في المليون أو براشح بكتيريا *B. subtilis* أو براشح فطر *T. harzianum* أو بخليط يجمع مستخلص صمغ النحل مع راشح البكتيريا أو مع راشح الفطر أو بخليط من الثلاثة معاً. وتم رش نباتات المجموع الثالثة بماء الصنبور أو بالمبيد توباس بمعدل 12.5، 25، 50 مل/100 لتر، واستخدمت كشاهد للمقارنة. وكانت النتيجة حدوث تناقص معنوي في نسب إنبات أبواغ الفطر الممرض، وفي النسب المنوية لحدوث المرض وشدته كلما زاد تركيز كل من فوسفات البوتاسيوم أو عند استخدام مستخلص البروبليس أو رشاحة البكتيريا *B. subtilis* أو رشاحة الفطر *T. harzianum* أو خليط يجمع مستخلص البروبليس مع رشاحة البكتيريا أو رشاحة فطر المكافحة الحيوية أو خليط الثلاثة معاً.

BC 55

دراسة تأثيرات التضاد لبعض العزلات البكتيرية في تعفن جذور وعنق (تاج) أشجار التوت. أفساني ميراث¹، مصطفى نيكينجاد كازيمبور²، وإسماعيل كامران¹. (1) مركز بحوث دودة القز الإيراني، ص.ب. 41635-1763، راشات، جولان، إيران، البريد الإلكتروني: merat2530@yahoo.com؛ (2) قسم أمراض النبات، كلية الزراعة، جامعة جولان، إيران.
تم في هذه الدراسة البحث في تأثيرات التضاد لخمس عزلات بكتيرية جمعت من محيط جذور أشجار التوت في أربعة فطريات مسببة لتعفن جذور وعنق أشجار التوت. تنتمي العزلات الثلاثة M-30، M-39 و M-163 إلى الجنس *Pseudomonas*، والعزلتان M-148 و PI-5 إلى الجنس *Bacillus*. أظهرت النتائج التأثيرات المضادة للبكتيرية تجاه الفطريات الممرضة تحت ظروف المختبر. وكان أكبر التأثيرات المثبطة لنمو الفطريات *Lasiodiplodia theobromae*، *Fusarium solani*، *F. oxysporum*، و *Rhizoctonia solani* قد تحقق باستخدام العزلات M-148 (93.7%)، PI-5 (80.76%)، و M-163 (60.78%). وأمكن في ظروف البيت الزجاجي تثبيط تطور المرض المتسبب عن الفطريات *L. theobromae*

BC 49

دراسة تأثير ثلاثة أنواع بكتيرية من جنس *Bacillus* في نمو فطر *Ascochyta rabiei*. الويزة بوعيد الله ومليكة خواجية، مخبر ميكروبيولوجيا، قسم بيولوجي، جامعة السانبا وهران، الجزائر، البريد الإلكتروني: Khouaidjia_malika@yahoo.fr
يعتبر الحمص من أهم البقوليات المستهلكة في الجزائر وتكمن أهميته من حيث غناه بالبروتينات ودوره الهام في تثبيت الأروت في التربة. يتعرض الحمص للإصابة بفطر *Ascochyta rabiei* مسببا له مرض اللقحة الذي قد يؤدي إلى تلف المحصول بأكمله إذا كانت الظروف البيئية ملائمة لنمو الفطر. استعملت عدة وسائل (كيميائية ووراثية) لمكافحة هذا المرض، إلا أن هذه الأخيرة أدت إلى ظهور سلالات فيزيولوجية. لهذا السبب يعتبر هدف هذا البحث هو إيجاد وسيلة مكافحة بديلة وهي مكافحة الحيوية حيث يتم استغلال ظاهرة التضاد الحيوي بين الأحياء الدقيقة كالبكتيريا، الفيروسات أو الفطريات ضد فطر *A. rabiei*. في هذا البحث، تم استخدام عزلتين (S1 و S2) من فطر *A. rabiei* ضد ثلاث أنواع من البكتيريا، وتم زرع الشاهد بغياب البكتيريا. بعد مدة التحضين، أظهرت النتائج تفاوتاً في درجة تثبيط نمو الفطر باستخدام الأنواع الثلاث من *Bacillus*. يعد نوع *B. subtilis* أكثرها قدرة في تثبيط نمو الفطر إلى درجة انعدام نمو العزلتين. وكان النوعان *B. circulairs* و *B. firmans* أقل قدرة في تثبيط عزلتي الفطر S1 و S2، على التوالي، وكان معدل نمو العزلتين مقارب لمعدل نمو الشاهد.

BC 50

إمكانية استخدام الكائنات الحيوية الدقيقة في مكافحة مرض البيوض على نخيل التمر وبعض الأمراض الوبائية الأخرى. مولاى الحسن سدره، المنظمة العربية للتنمية الزراعية، مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، ص.ب. 533، المعهد الوطني للبحث الزراعي، مراکش، المغرب، البريد الإلكتروني: sedramh@menara.ma،
mhsehra@yahoo.fr، sedramh@hotmail.com

يعد مرض البيوض من أخطر الأمراض على نخيل التمر ومن الأمراض التي تصعب مكافحتها في العالم. على الرغم من استنباط بعض الأصناف والسلالات المقاومة للمرض، لا تزال أصناف عديدة ذات شهرة تجارية وسلالات جديدة جيدة حساسة للمرض وتعاني من الإبادة والإنقراض من الواحات المغربية بسبب انتشار المرض وشدة ضراوة سلالات الفطر المسبب له. وبهدف حماية واستغلال هذه الأصناف الثمينة و/أو النادرة أمام هذا الخطر، يعد استخدام مكافحة الحيوية أمراً ممكناً. أسفرت نتائج تجارب البيت الزجاجي المقدمة في هذا البحث أن قدرة بعض الكائنات الحية الدقيقة في خفض إصابة نباتات النخيل بمرض البيوض بالمقارنة مع استخدام المبيدات الكيميائية وكذلك أبانت هذه الكائنات المضادة قدرتها في حماية نباتات الطماطم والكتان من إصابتها بالأمراض الخاصة بها. من خلال المناقشة، تبين أنه أصبح ممكناً استغلال هذه الكائنات المضادة في مجال وقاية وحماية النخيل من مرض البيوض، كما يمكن تطبيق هذه النتائج في نماذج أخرى للمزروعات.

BC 51

المكافحة الحيوية لمسبب مرض البيوض باستخدام فطري *Trichoderma harzianum* و *Trichoderma viride*. مها رشيد محسن¹، عبد العزيز تكسانة²، مبارك بقة². (1) قسم علوم الحياة، جامعة سطيف، سطيف، 19000 الجزائر، البريد الإلكتروني: taxanna@yahoo.fr (2) قسم علوم الحياة، جامعة قسنطينة، 25000، الجزائر.

تعد نخلة التمر (*Phoenix dactylifera* L.) من الأشجار المهمة في شمال أفريقيا لما توفره من غذاء لسكان المناطق التي تزرع فيها، إلا أنها تصاب بفطر يؤدي إلى هلاكها والقضاء عليها. عزل المسبب المرضي *Fusarium oxysporum* f. *albendinis* sp. من جريد نخلة مصابة على وسط مستخلص الشعير وتمت تنقية الفطر بطريقة البوغة المفردة، وشخص الفطر اعتماداً على صفاته الشكلية المرئية والمجهريّة. أظهرت النتائج وجود عزلة جديدة للفطر المدروس اختلفت في لون المستعمرة وشكلها وأبعاد الأبواغ الكونيدية عما ذكر في المراجع. وكانت نتائج مكافحة الحيوية للفطر باستخدام فطري *Trichoderma harzianum* و *T. viride* مشجعة، حيث كان تأثيرهما واضحاً ومميزاً في تثبيط نمو فطر *F. oxysporum* f. *albendinis* sp. وذلك لامتلاكهما آليات عديدة، كإنتاج المضادات الحيوية أو عملية التطفل الفطري أو التنافس على الغذاء أو إنتاج المواد الاستقلابية الطيارة والتي ينفرد بها نوع *T. viride*.

BC 52

تحضير الفطرين *Trichoderma harzianum* و *Paecilomyces lilacinus* لاستخدامهما كمبيدين أحيائيين. هادي مهدي عبود وحمود مهدي صالح، وزارة العلوم والتكنولوجيا، دائرة البحوث الزراعية وتكنولوجيا الغذاء، ص.ب. 765 بغداد، البريد الإلكتروني: hadimahdiaboud@yahoo.com

أظهرت نتائج تقييم ثمانية مستحضرات مختلفة لفطري مكافحة الأحيائية *Trichoderma harzianum* و *Paecilomyces lilacinus* باستخدام بعض المخلفات الزراعية كقاعدة غذائية حاملة، أن المستحضر المكون من خليط اللقاح الفطري وجريش كوالح النرة ونخالة الحنطة (1: 2.5: 0.5/وزن: وزن: وزن) كان الأفضل في زيادة الأعداد والفاعلية

BC 46

المقاومة الحيوية لمرض عفن الساق البني في فول الصويا المتسبب عن الفطر *Phialophora gregata*. أحمد محمد حسنين¹، متولى على بركة² ومحمد عبد العظيم عبد العال¹. (1) معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجيزة، مصر؛ (2) قسم النبات الزراعي، كلية الزراعة، جامعة قناة السويس، الإسماعيلية، مصر، البريد الإلكتروني: ahmedhassanein48@yahoo.com

يعد مرض عفن الساق البني على فول الصويا المتسبب عن الفطر *Phialophora gregata* من أهم الأمراض التي تصيب فول الصويا في مصر. حيث يؤدي إلى حدوث خسائر كبيرة في عدد النباتات بالفدان وبالتالي نقص في محصول البذور يصل إلى 37%. في هذه الدراسة تم اختبار أربعة عوامل حيوية ضد الفطر *P. gregata* المسبب لمرض موت البادرات وعفن الساق البني في فول الصويا تحت ظروف المختبر والحقل. أوضحت النتائج المتحصل عليها أن العوامل الحيوية المختبرة وهي الفطر *Trichoderma harzianum*، والمبيد الحيوي Biozeid (*Trichoderma album*)، والفطر *Gliocladium virens* والمبيد الحيوي Bioarc (*Bacillus megaterium*) لها القدرة على التضاد مع الفطر *P. gregata*، حيث أدت إلى تخفيض معنوي للنمو الطولي للميسليوم على بيئة بطاطس دكستروز أجار. أظهرت نتائج الدفيئة أن كل العوامل الحيوية والمبيدات الحيوية المستخدمة أدت إلى تقليل معنوي في نسبة موت البادرات وشدة الإصابة بمرض عفن الساق البني وإلى تحسن واضح في نمو النبات ووزنه الطازج والجاف.

BC 47

تأثير ثلاث طرائق حيوية ضد مرض ذبول الفيوزاريوم في الخيار. منى عبد المنعم الشامي، قسم بحوث أمراض الخضر، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: monash512@yahoo.com
اختبرت ثلاث وسائل حيوية لمكافحة مرض الذبول الفيوزاريومي على الخيار المتسبب عن الفطر *Fusarium oxysporum f.sp. cucumerinum*، وهي: استخدام مستخلصات نباتية ممثلة في مستخلص الثوم، وعوامل مكافحة الأحيائية ممثلة في فطر *Trichoderma harzianum*، وسلالة غير ممرضة لفطر *F. oxysporum*، وقد قورنت الطرائق الثلاثة المختبرة بمعاملة كيميائية قياسية باستخدام مادة كربوكسين/ثيرام. تم الحصول على 12 عزلة من الكائن الممرض من ثلاث محافظات، وتم اختبار قدرتها الإمراضية. وبالرغم من تفوق المادة الكيميائية في مكافحة المرض إلا أن استخدام السلالة غير الممرضة قد أعطى نتائج جيدة في تثبيط المرض تلاها المعاملة بمستخلص الثوم ثم المعاملة بالفطر *T. harzianum* ودون فروق معنوية بين المعاملتين الأخيرتين. وتهدف هذه الدراسة إلى الإفادة من أفضل معاملة غير كيميائية كبديل آمن لإستخدام المبيدات وذلك للحد من تلوث البيئة والحفاظ على صحة الإنسان.

BC 48

عزلات من البكتيريا *Bacillus subtilis* (LIR225) و *Pantoea agglomerans* (HIP32) كعوامل مكافحة حيوية واعدة في التربة. خديجة فرج العربي، قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: Khadija_faraj@yahoo.com

سجلت عزلات من البكتيريا *Bacillus subtilis* و *Pantoea agglomerans* نجاحاً وتأثيراً قويا كعوامل مكافحة حيوية ضد عدد من الكائنات الممرضة للنبات. وهما الآن يستخدمان على نطاق واسع في عدد كبير من دول العالم كمنتجات تجارية. تم عزل العزلة LIR225 من تربة المحيط الجذري للزيتون في منطقة بنغازي وعزلت الثانية HIP32 من أسطح أوراق أشجار التفاح من منطقة بودابست بالمجر. وتم اختبارهما على النباتات وفي التربة وتم تعريفهما. وقد درست حيوية هذه العزلات في التربة في 4 تجارب مستقلة وكفاءتها في استعادة نمو العزلة (سم³) من *Clavibacter michiganensis* subsp. *michiganensis* مسبب مرض التقرح البكتيري على الطماطم/البندورة والسلالة SO8 من *Xanthomonas vesicatoria* مسبب مرض تبقع أوراق الطماطم/البندورة والفلفل. ففي تربة طينية رملية معقمة ومحددة المكونات والقدرة الامتصاصية للماء، تم خلط معاملات الكائن الممرض مع عامل مكافحة الحيوية بنسب محددة كل على حدة في معاملات منفصلة. وتم أخذ العينات ابتداءً من اليوم الأول للمعاملة ولمدة 5 أسابيع ومراقبة نمو الممرضين على وسط أجار مغذي NA يحتوي على مضاد حيوي Nitrofurantoin لنمو العزلة SO8 والمضاد الحيوي Licomycin لنمو السلالة (سم³)، وتثبيط نمو عاملي مكافحة الحيوية. ومن تعداد عدد الوحدات المشكلة للمستعمرات (CFU) لكل من العزلتين الممرضتين وجد أن هذه العوامل الحيوية قد خفضت بفاعلية نمو وعدد مستعمرات العزلة SO8 في التربة. بينما كان لها كفاءة متوسطة في خفض نمو مستعمرات السلالة (سم³). وكان ذلك التأثير واضحا بعد 3 أسابيع من التجربة مما يظهر نتائج واعدة ضد مسببات الأمراض البكتيرية. ولم يسجل وجود مستعمرات مقاومة أثناء هذه التجارب.

و 35 مقارنة مع الشاهد (المرض لوحده) التي كانت 100%. وبذلك تكون هذه الدراسة الحالية قد فتحت أبواباً على دراسات مستقبلية عن استغلال هذه البكتيريا أو منتجاتها في مكافحة البيولوجية لهذا المسبب المرضي.

BC 43

المكافحة الحيوية لأمراض تعفن الجذور في الموز ويليماز. حاتم محمد الديب ومحمد عبد العزيز النجار، قسم أمراض النبات، المركز القومي للبحوث، شارع البحوث، الدقي، جيزة، مصر، البريد الإلكتروني: seham_el_deeb@hotmail.com
تم عزل ثلاثة أنواع فطور مسببة لأعفان جذور الموز وهي *Fusarium moniliforme* (Schlect)، *Fusarium* *solani* (Martius) و *Rhizoctonia solani* (kuhn) المعزولة من الموز ويليماز المزروع في محطة بحوث البساتين بالقناطر الخيرية، مصر. تم وقف نمو الفطريات الثلاثة المسببة لأعفان الجذور باستخدام تركيز 2.5 غ/لتر ماء من المستحضر الحيوي *Bacillus subtilis* حيث أوقف النمو الطولي للفطريات الثلاثة وكان أقل المركبات الحيوية تأثيراً هو *Streptomyces scabies*. التطبيق الحقل للتركيز الأمثل للمركب الحيوي تحت ظروف الصوبة باستخدام تربة ملوثة بالفطريات المسببة لأعفان الجذور والرّي بتركيز 2.5 غ/لتر ماء قلل من شدة الإصابة للفطريات الثلاثة مقارنة بالشاهد ومقارنة بمعاملة جذور فسائل الموز بالمركب الحيوي وبنفس التركيز. وبشكل عام فإن استخدام المركب الحيوي *Bacillus subtilis* بتركيز 2.5 غ/لتر والرّي لمدة 45 يوماً يحد من نشاط فطريات أعفان الجذور.

BC 44

فاعلية بعض عزلات البكتيريا والفطريات المضادة في مقاومة أمراض الفول السوداني. مدحت سعد عبد المجيد¹، أحمد غنيم رحال²، نشوى عبد العليم فتّيان² ومحمد فاضل³. (1) معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجيزة، مصر؛ (2) معهد بحوث الأراضي والمياه والبيئة، مركز البحوث الزراعية، الجيزة، مصر؛ (3) قسم كيمياء الكائنات الدقيقة، المركز القومي للبحوث، الدقي، القاهرة، البريد الإلكتروني: omniamedhat2006@yahoo.com
تم دراسة تأثير ثلاث عشرة عزلة من عزلات البكتيريا *Bacillus subtilis* و *B. thuringensis* وبعض أنواع من الفطريات على مرض موت البادرات قبل وبعد الإنبات، وكذلك أعفان الجذور وأعفان القرون بالإضافة إلى استخدام مادة كلين روت ومبيد ريزولكس تي. وأظهرت النتائج أن معاملات بكتيريا *B. thuringensis* (عزلة رقم 536)، *B. subtilis* (عزلة رقم 50) وفطر *Trichoderma reesi* كان أفضلها من حيث تقليل الإصابة بمرض موت البادرات قبل وبعد الإنبات. بينما قللت البكتيريا *B. subtilis* (رقم 50)، *B. thuringensis* (رقم 536) ومادة كلين روت من الإصابة بأعفان جذور الفول السوداني، كما أن معظم المعاملات قللت من نسبة الإصابة بأعفان القرون 19.3-58% و 17.2-54.2% عند تقييمها خلال موسمين متتاليين، على التوالي. كما سجلت زيادة معنوية في المحصول وخاصة باستخدام البكتيريا *B. subtilis* (رقم 49 و 22)، *B. thuringensis* (رقم 341 و 536) وفطر *Trichoderma reesi*. أظهرت النتائج زيادة في أطوال المجموع الخضري والجذور والوزن الجاف والطازج لكليهما باستخدام المعاملات البكتيرية والفطرية المضادة وذلك عند مقارنتها بالشاهد. وقد وجد أن معاملة بذور الفول السوداني بالكائنات الحيوية المضادة تقلل من نشاط النيتروجين في التربة عند المقارنة بالشاهد. أيضاً سجلت النتائج زيادة في أعداد البكتيريا الكلية المتواجدة في التربة مع كل المعاملات ماعدا كلين روت وريزولكس تي. أدى استخدام بكتيريا *B. thuringensis* (رقم 341 و 536) إلى زيادة في التعداد الكلي للبكتيريا، بينما أدى استخدام بكتيريا *B. subtilis* (رقم 47 و 64)، الفطر *Trichoderma reesi* و *B. thuringensis* (رقم 133 و 341) لزيادة أعداد الفطريات مقارنة بالمعاملات الأخرى.

BC 45

فاعلية الفينازينات المناهضة لنمو الفطور المستخلصة من سلالة من البكتيريا *Pseudomonas aureofaciens*. عبد الهادي قسي وسامية مزعاش، مخبر الأحياء الدقيقة وأمراض النبات، كلية العلوم، جامعة فرحات عباس، سطيف، 19000 الجزائر، البريد الإلكتروني: guechi.abdelhadi@caramail.com
امتازت البكتيريا *Pseudomonas aureofaciens* المعزولة من محيط جذور نبات البطاطا/البطاطس بقدرتها على مناهضة نمو الفطرين المرضيين *Fusarium solani* و *Fusarium oxysporium* اللذان يسببان مرض تعفن جذور البطاطا عند إختبارها في ظروف المختبر. تم تثبيط هذا النشاط بعد معاملة البكتيريا *Pseudomonas aureofaciens* بمادة Ciprofloxacin، التي أحدثت طفرات في البكتيريا لا تنتج الفينازينات. بينت النتائج أن البكتيريا المعزولة كانت سلالة برية لها القدرة على تثبيط نمو الفطرين السابق ذكرهما أعلاه، وذلك بإنتاج ثلاثة أنماط من الفينازينات.

العزلات بمستوى تضادها العالي والذي يتجاوز 82%. ولمتابعة باقي برامج البحث المتبقية، تم الاحتفاظ بعزلتين هما Ach1-1 و 5-1113.

BC 40

تأثير مخلفات عصر الزيتون (ماء الجفت والعرجوم) في نمو بعض فطور التربة ونباتات البندورة/الطماطم. صباح المغربي، قسم وقاية النبات، جامعة تشرين، كلية الزراعة، اللاذقية، سورية، البريد الإلكتروني: tabbache@scs-net.org
تم دراسة تأثير مخلفات عصر الزيتون (ماء الجفت والعرجوم) بتركيزين 0.5 و 1% على نمو 5 أنواع فطرية، 4 منها وهي *Fusarium*، *Sclerotinia*، *Botrytis* و *Alternaria* ممرضة للنبات، والفطر تريكوديرما يستخدم في مكافحة الحيوية واختبرت مخبريا في أطباق بتري، وفي الأصص لمعرفة تأثيرها في بادرات البندورة بوجود الفطور المدروسة. أظهرت النتائج بأن لماء الجفت والعرجوم تأثير مثبت في نمو الفطور المدروسة وفي جميع الفترات باستثناء الفطر تريكوديرما ويمكن ترتيبها حسب نسبة تثبيطها، على التوالي: *Alternaria*، *Fusarium*، *Botrytis* و *Sclerotinia*. كذلك أظهرت تأثيرا سلبيا في نمو بادرات البندورة بوجود الفطور، إذ ماتت البادرات بتأثير ماء الجفت بعد سقاية الأصص لمرة واحدة بعد الزرع في الأسبوع الأول والثاني. وعند إعادة الزرع قل التأثير المثبط للنمو بوجود الفطور تريكوديرما وفيوزاريوم، وكان للعرجوم تأثيرا مشابها وخصوصا بالتركيز 10%. انخفض متوسط طول الساق والجذر في معظم المعاملات، وكذلك الوزن الرطب للنباتات وتراوح ما بين 4-39.8% لماء الجفت، و4.6-76.3% للعرجوم حسب المعاملة.

BC 41

المكافحة الحيوية بواسطة ثلاثة أنواع من البكتيريا (*Corynebacterium spp.*، *Micrococcus spp.*، *Bacillus subtilis*) ضد الفطر *Rhizopus stolonifer* المرافق لحبوب الشعير بمدينة مصراتة، ليبيا. الطاهر مصطفى الحقي وعادل عمر عاشور، قسم الأحياء الدقيقة، كلية العلوم، جامعة 7 أكتوبر مصراتة، ليبيا، البريد الإلكتروني: aoammg76@yahoo.com
أجريت هذه الدراسة لمعرفة تأثير عزلات البكتيريا *Bacillus subtilis*، *Corynebacterium spp.* و *Micrococcus spp.* في نمو الفطر *Rhizopus stolonifer* المرافق لحبوب الشعير بالمخازن، وكذلك تأثيرها في نسبة إنبات هذه الحبوب، ومقارنة تأثيرها مع تأثير ثلاث أنواع من المبيدات الفطرية وهي التوبسين والبنليت والدايثين M45. استخدمت في هذه الدراسة أربعة عينات من حبوب الشعير لأربع مناطق مختلفة من مدينة مصراتة وأربعة عينات من التربة لنفس هذه المناطق، وتم الحصول على عدد من العزلات البكتيرية والفطرية من بينها الأنواع السابقة الذكر. واختبرت ظاهرة التضاد (*antagonism*) على أطباق بتري تحتوي على وسط PDA. أظهرت النتائج مقارنة مع الشاهد والمبيدات المستخدمة أن الأنواع البكتيرية الثلاث أبدت قدرة تضادية جيدة للفطر *Rhizopus stolonifer* وهذا التثبيط يعزى إلى احتمالية التطفل الفائق (*hyperparasitism*) أو إنتاج مواد أيضية سامة ضد هذا الفطر، أما بالنسبة لتأثير الرواشح البكتيرية في الحبوب فإنها لم تؤد إلى خفض نسبة إنباتها مما يشير إلى إمكانية اتباع طريقة معاملة حبوب الشعير برواشح هذه الأحياء المضادة مع أخذ العوامل البيئية والفسولوجية الأخرى بعين الاعتبار. نحتاج لدراسات لاحقة للتأكيد على أنه لا يوجد تأثيرات سلبية لهذه الأحياء.

BC 42

المكافحة الحيوية لمرض العفن الفحمي المتسبب عن الإصابة بفطر *Macrophomina phaseolina* باستخدام عزلات من الكائنات الدقيقة المعزولة من البيئة الأردنية. محمود أحمد الخشاشنة¹ وخالد ماجد حميد¹. (1) قسم الإنتاج النباتي، كلية الزراعة، جامعة العلوم والتكنولوجيا الأردنية، ص.ب. 3030، اربد 22110، الأردن، البريد الإلكتروني: hameed@just.edu.jo، mahmoudk@just.edu.jo

يعتبر مرض عفن الجذور على المحاصيل الخضرية وأشجار الفاكهة وغيرها المتسبب عن الإصابة بفطر *Macrophomina phaseolina* من الأمراض الهامة التي تصعب مكافحتها، خاصة أنه لا يوجد أصناف مقاومة أو مبيد فطري فعال لهذا الفطر. يستطيع هذا الفطر البقاء في التربة لعدة سنوات وتحت ظروف بيئية قاسية على شكل أجسام حجرية. لهذا السبب كان التوجه للمكافحة الحيوية كإجراء بديل وواعد للسيطرة على هذا المرض. عرف عن بكتيريا *Pseudomonads* و *Actinomycetes* قابليتها بالتضاد مع بعض المسببات المرضية. لذلك تم استخدام عزلات محلية من تلك البكتيريا في دراسة مكافحة البيولوجية لمسبب هذا المرض. إن البكتيريا التابعة لمجموعة *Pseudomonads* أظهرت قدرتها على تثبيط النمو الفطري لهذا المرض مخبريا ومنع تكون الأجسام الحجرية، كما أظهرت النتائج أن مجموعة *Actinomycetes* لديها القدرة على إنتاج الأنزيم المحطم للكيتين وتثبيط النمو الفطري. وتحت ظروف الإصابة الإصطناعية لهذا المرض على النباتات القائمة من العائلة القرعية واستخدام تلك البكتيريا مضافة إلى التربة أظهرت الدراسة نتائج متباينة في وقوع الإصابة وشدها، إذ تراوحت الإصابة ما بين الحد الأدنى 20% في حالة العزلات ذات الأرقام 17، 40 و 38 والحد الأعلى 80% للعزلات 12

BC 37

المكافحة الأحيائية لمرض ذبول البندورة/الطماطم الفيوزاري. جاهاشير أميني، قسم وقاية النباتات، كلية الزراعة، جامعة كردستان، شارع بازاندران، ص.ب. 416، رمز بريدي 66177-1517، سننداج، إيران، البريد الإلكتروني: aminij2002@yahoo.com

يعد الفطر *Fusarium oxysporum* f. sp. *lycopersici* (FOL) ممرضاً منقولاً مع التربة يسبب الذبول وقد يترافق أحياناً بخسائر عالية في الإنتاج. وتعد مكافحة الأحيائية للمرض سياسة إدارة بديلة للمرض. وفي هذا البحث، تمت دراسة التأثيرات التضادية لـ 9 عزلات من *Pseudomonas fluorescens*، *Bacillus subtilis* و *Serratia marcescens* في المختبر على مستنبت King'B ومستخلص بطاطا دكستروز أغار إزاء الفطر FOL وتم تسجيل مساحة المستعمرات، ومقارنتها بالشاهد ومن ثم حساب نسبة تثبيط النمو. وفي تجارب في الدفيئة، تم قطع جذور أشتال طماطم/بندورة بعمر 3 أسابيع وغطست في معلق بكتيري تركيزه 10^6 وحدة مشكلة للمستعمرات CFU/مل لمدة 30 دقيقة. وبعد 7 أيام تم إعادة قطع الجذور وغطست في معلق الأبواغ الكونيدية لفطر FOL تركيزه 10^6 بوغة/مل. وتم تقدير شدة الإصابة بعد 4 أسابيع من الإلقاح وكانت المعايير المستخدمة للتقدير: معامل المرض للورقة، ارتفاع النبات، وتلون الأوعية الناقلة. اعتمدت التجربة بتصميم كامل العشوائية وضمن أصص تحت ظروف الدفيئة وحللت إحصائياً ببرنامج MSTATC. وتم إعادة عزل البكتيريا *P. fluorescens* من سوق الطماطم/البندورة بعد 7 أيام تركيزه 10^4 وحدة مشكلة للمستعمرات/وزن رطب. في المختبر تبين أن النسبة المنوية لتثبيط النمو تختلف معنوياً ما بين عزلات الكائنات المضادة فكانت تتراوح ما بين 20-60%. وأظهرت العزلات CW2، W34 و C81 من *P. fluorescens* آثاراً تضادية في المختبر والدفيئة إزاء FOL. وتشير النتائج المتحصل عليها إلى أن أربعة عزلات مختارة من *P. fluorescens* كانت قادرة على خفض الشدة المرضية بفاعلية تتراوح ما بين 2-8 مرات وتخفيف نمو النبات 3 أضعاف مقارنة مع الشاهد المصاب، في حين لم تكن عزلات *B. subtilis* و *S. Marcescens* فاعلة بشكل دائم.

BC 38

دراسة تأثير مركبات زيت نبات *Lavandula officinalis* في مرض اللفحة النارية. روح الله كرمي - أوسبو¹ ومهدي خودا فردي². (1) معهد أفات وأمراض النبات، شارع يمان سانت شامران، طهران، إيران و(2) جامعة آزاد الإسلامية، طهران، إيران، البريد الإلكتروني: karamiosboo@yahoo.ca

عرفت الزيوت النباتية الطيارة منذ الأزل بامتلاكها لأنشطة بيولوجية/حيوية. واللفحة النارية هي مرض بكتيري يمكنه إتلاف بسنتين التفاح والإجاص في موسم واحد، وتحديثه البكتريا *E. amylovora*. وتستخدم عدة مواد كيميائية بما في ذلك مركبات النحاس والمضادات الحيوية لمكافحة اللفحة. وباستثناء الستربتومايسين، لا يوجد حتى الآن منتج مسجل يمكنه مكافحة اللفحة النارية بفاعلية. وكان للزيت الأساسي من نبات *Lavandula officinalis* أثر في هذه البكتريا. وتم الحصول على الزيت بتقشير مائي. وتم القيام بتحليل GC-MS لمعرفة تركيب الزيت. وباستخدام عمود الكروماتوغرافيا، تم فصل مركبات الزيت الأساسي ودرس أثر كل جزء منها في البكتريا. وسناقش الباحث نتائج تحليل زيت اللاوند وتأثير مركباته في البكتريا

BC 39

انتقاء مضادات لفظور أعفان ما بعد الجني عند التفاح (*Botrytis cinerea* و *Penicillium expansum*). الحسن اشباني¹، ربيعة مونير^{1,3}، سمير الجعفاري²، علاء دويرة³، عبد اللطيف بنبوعزة¹ وعصام جيجاكلي⁴. (1) مختبر أمراض الجراثيم من أصل بكتيري والمكافحة الحيوية، المركز الجهوي للبحث الزراعي مكناس، ص.ب. 578، مكناس، 50100 المغرب، البريد الإلكتروني: achbani5@yahoo.fr؛ (2) مختبر التكنولوجيا الحيوية والتحسين الوراثي، جامعة مولاي اسماعيل، ص.ب. 4010، مكناس، المغرب؛ (3) مختبر البيولوجيا ووقايات النبات، جامعة بن طفيل، كلية العلوم، ص.ب. 133، 14000 القنيطرة، المغرب؛ (4) وحدة أمراض النبات، الكلية الجامعية للعلوم الزراعية، ممر الديبورت، ص.ب. 5030، جومبلو، بلجيكا.

يهدف هذه العمل إلى البحث عن مضادات لمسببين لأمراض ما بعد الجني عند التفاح وهما *Penicillium expansum* و *Botrytis cinerea*. تم عزل من سطح فاكهة التفاح (صنف *Golden delicious*) 33 عزلة مختلفة تنتمي إلى البكتيريا والخمائر والفطريات. وأظهرت ست من الخمائر قدرة تضادية عالية جداً إزاء *Penicillium expansum* داخل غرفة الإنبات عند درجة حرارية 25 ± 0.5 °س. كما أظهرت عزلات Ach1-1، Ach2-1، Ach2-2، Ach2-3، 1113-10 و 1113-5 عن نشاط مضاد عال يزيد على 80% من حماية التفاح ضد فطر *P. expansum*. وذلك بعد 5 أيام من المواجهة. وسجلت أكبر نسبة تضادية عند العزلة Ach2-1 (96%). أما تجاه *B. cinerea*، فنسب الحماية المسجلة من طرف كل من Ach2-1 و Ach2-2 تتراوح بالتتالي ما بين 100 و 96 بعد 6 أيام من المواجهة. وتبين أيضاً أنه عند درجة حرارة 15 ± 1 °س، تحتفظ

BC 35

عزل المضادات البيبتيدية من بكتيريا *Bacillus brevis* و *Bacillus polymyxa* المثبطة لخطر التعفن الرمادي *Botrytis cinerea* على الفراولة/الفريز. وفاء محمد حجاج، قسم أمراض النبات، المركز القومي للبحوث، الدقي، مصر، البريد الإلكتروني: wafaa_haggag@yahoo.com

يعتبر مرض التعفن الرمادي والمتسبب عن الفطر *Botrytis cinerea* من الأمراض المهمة والمدمرة حيث تؤدي إلى حدوث خسائر كبيرة في محصول الفراولة/الفريز. تم عزل كل من البكتيريا (*Brevibacillus brevis*) *Bacillus brevis* و (*Paenibacillus polymyxa*) *Bacillus polymyxa* والتي أظهرت قدرة تضادية عالية للفطر الممرض *B. cinerea*. ومن فوائد استخدام هذه البكتيريا يرجع للتأثير الكيميائي والفيولوجي للبيبتيدات التي تنتجها والتي تعتبر كمضادات حيوية للميكروبات. صممت هذه الدراسة لقياس النشاط الحيوي لكلا النوعين وإنتاجهما من البيبتيدات المستخدمة كمضادات حيوية للممرض *Botrytis cinerea* على الفراولة/الفريز مختبرياً وحقلياً. أظهرت الإختبارات المختبرية أن كلا من الميكروبين ثبت بشدة إنبات الأبواغ ونمو الميسيليوم وإنتاجه للأنزيمات الخارجية. وكانت *Bacillus brevis* بصفة عامة هي الأكثر تأثيراً في تقليل نمو الفطر الممرض *Botrytis*. تم استخلاص البيبتيدات Gramicidin S و Polymyxin B كمضادات حيوية من رشح كل من النوعين *B. brevis* و *B. polymyxa*، على التوالي، وتم تنقيتهما باستخدام الفصل الكروماتوجرافي وعرف بواسطة High Performance Liquid Chromatography (HPLC). ووجد أن إنبات الأنواع ومعدل النمو الميسليومي وإنتاج الأنزيمات الخارجية للممرض كان أكثر حساسية للمضادات الحيوية. وكان Gramicidin S هو الأكثر نشاطاً في تثبيط الفطر الممرض عند أقل تركيز هو 15 ميكرومول. وكذلك أظهر Polymyxin B نشاطاً في تثبيط الفطر الممرض عند تركيز 25 ميكرومول. تحت الظروف المتحكم بها (18-22 °س، 90% رطوبة نسبية و 12 ساعة ضوء). تم رش نباتات الفراولة بكل من الممرض (10⁵ بوغة/مل) والبكتيريا المضادة (10⁸ خلية/مل) والمضادات البيبتيدية (0-30 ميكرومول) لتقليل حدوث الإصابة بالعدوى الرمادي. وأظهرت النتائج إنخفاضاً في حدوث الإصابة عند وجود *B. brevis*. كذلك أظهر استخدام كل من البيبتيدات تأثير تثبيطي لنمو البكتيريا الذي تم ملاحظته باستخدام الميكروسكوب الإلكتروني الماسح. وعلاوة على ذلك أظهرت النتائج أيضاً وجود إدمصاص الأوراق النباتية لكميات من المضادات الحيوية ترواحت ما تصل بين 46.1-67.5% من تركيز المحلول الأصلي. وتحت ظروف الحقل الطبيعية، تم إختبار كل من الميكروبات والبيبتيدات كمبيدات فطرية بتركيزات مختلفة خلال موسمي 2003/2004 و 2004/2005 ضد التعفن الرمادي. ووجد أن معاملة النباتات بالميكروب *B. brevis* كان له تأثيراً عالي المعنوية ضد حدوث وتطور المرض على الفراولة. كما أن Gramicidin S أظهر فاعلية عالية في تقليل حدوث الإصابة تبعه في ذلك Polymyxin B، واللذان تمثلتا كمبيدات حيوية لتأثيرهما في تثبيط نمو الممرض. وكان تثبيط الفطر الممرض *Botrytis* بواسطة كل من الميكروبين مماثلاً في تأثيرهما للمضادات الحيوية المنتجة، كانت الإضافة إلى أن هذه المعاملات لها تأثير معنوي واضح في تقليل حدوث الإصابة وزيادة معدل المحصول. وبذلك يمكن اقتراح أن *B. brevis* و *B. polymyxa* ذو فاعلية في مقاومة المرض على الفراولة من خلال قدرتهما على إنتاج المضادات الفطرية البيبتيدية Gramicidin S و Polymyxin B. لذلك يعتبر كل من Gramicidin S و Polymyxin B كعوامل مكافحة حيوية ويمكن أن يلعب دوراً معنوياً في المجال التطبيقي لإدارة إنتاج الفراولة مستقبلاً.

BC 36

المقاومة الحيوية لتعفن جذور الفاصولياء. نهال يونس المراد¹، علي كريم محمد الطائي². (1) قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق؛ (2) قسم الوقاية، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nihaly04@yahoo.com

أثرت عناصر المقاومة المستخدمة معنوياً في خفض النسبة المئوية للإصابة بمرض موت البادرات قبل وبعد ظهورها المتسبب عن الفطريات *Fusarium solani*، *Macrophomina phaseolina* و *Rhizoctonia solani* مفردة أو مختلطة، إذ اختلفت معنوياً فيما بينها، وأظهرت جميعها فرقاً معنوياً مع معاملة الشاهد. وكان لعناصر المقاومة تأثيراً معنوياً في تحسين الخصائص المدروسة لنبات الفاصولياء. وأوضحت النتائج أن معاملة البذور بالمبيد الحيوي البكتيري *Bacillus subtilis* أعطت أقل نسبة إصابة بالفطر *F. solani*. أما أفضل خليط لعناصر مقاومة الفطر *F. solani* فكانت (معاملة البذور بالبليت + معاملة التربة بـ *T. harzianum* + معاملة التربة بالزيت مع مبيد التحدي). أما مع فطر *M. phaseolina* فقد كان أفضل المعاملات الفردية هي معاملة البذور بالبليت، وجاءت بالمرتبة الثانية معاملة البذور بالمبيد الحيوي البكتيري *P. fluorescens* في حين أن معظم المعاملات الثنائية والثلاثية التي احتوت على المبيد بنليت مع عناصر المقاومة الأخرى كانت ذات نتائج جيدة وتفوقت على معاملة الشاهد. وتفوقت معاملة التربة بـ *T. harzianum* في حالة الفطر *R. solani* على بقية المعاملات الفردية وأن أفضل خليط لعناصر المقاومة هي (معاملة البذور بالبليت + معاملة التربة بـ *T. harzianum*).

النباتات لمدة 45 يوماً بعد اللقاح لتكملة دراسة قدرة تلك الأفراد على اختراق الجذور والنمو والتكاثر على العائل. أعطت كل أنواع فطريات التريكوودما المختبرة تأثيراً معنوياً جداً في تقليل نشاط وحركة النيماتودا الكلوية ونيماتودا تعقد الجذور بعد يومين من التعريض في أطباق بتري، وزاد معدل التأثير بعد أسبوع من المعاملة. كذلك وجد أن الفطرين *T. harzianum* و *T. hamatum* الأكثر تأثيراً من باقي أنواع الفطريات المختبرة إذ كانت نسبة الأفراد غير النشطة 89 و 100% عند تعريض النيماتودا الكلوية للفطر *T. harzianum* لمدة يومين وأسبوع، على التوالي. بينما كانت نسبة الأفراد غير النشطة نتيجة لتعريض إناث النيماتودا الكلوية للفطر *T. hamatum* هي 93 و 100% بعد يومين وأسبوع من التعريض، على التوالي، وتبعه الفطور على التوالي *T. koningii*، *T. viride* و *T. reesei* بدون فروق كبيرة بينها. وعند تعريض بيض نيماتودا تعقد الجذور *Meloidogyne javanica* لفطريات التريكوودما لمدة أسبوع انخفض كثيراً نسبة فقس البيض واختراق الجذور ثم التكاثر والنمو على نباتات الباذنجان صنف "بلاك بيوتي". ولم تسجل عقد جذرية أو أطوار غير الناضجة أو إناث ولا أكياس بيض عند معاملة البيض بفطر *T. harzianum* تبعه الفطور التالية على التوالي *T. hamatum*، *T. koningii*، *T. viride* و *T. reesei* الذي سجل 11 عقدة نيماتودية وبرتقن وثمانية أكياس بيض، بينما كانت الأعداد على الشاهد 109 عقدة جذرية و 40 طور يرقي و 94 أنثى منهم 74 واضعة للبيض. أكدت النتائج صدارة كل من الفطر *T. harzianum* والفطر *T. hamatum*، حيث كانت عدد العقد النيماتودية 4 و 6 عقد نيماتودية للفطريين، على التوالي، والإناث الواضحة للبيض 3 و 5، على التوالي. وكانت الأعداد للشاهد 100 عقدة نيماتودية و 94 أنثى ناضجة منها 74 أنثى واضعة للبيض ثم تلاه الفطرين *T. koningii* و *T. viride* فالفطر *T. reesei* بدون فروق معنوية.

BC 33

مكافحة نيماتودا الحمضيات/الموايح *Tylenchulus semipetrans* على أشجار البرتقال أبو سرة باستخدام مركب تجاري يحتوي على عزلة من البكتيريا *Bacillus thuringiensis*. وفاء محمد عبد الحميد النجدي ومحمود محمد أحمد يوسف، قسم أمراض النبات، مختبر النيماتودا، المركز القومي للبحوث، الدقي، القاهرة، مصر، البريد الإلكتروني: wafaa_elnagdi@yahoo.com

استخدم تحت ظروف الحقل مركب تجاري (أجارين) يحتوي على عزلة من البكتيريا *Bacillus thuringiensis* لمكافحة نيماتودا الحمضيات/الموايح *Tylenchulus semipetrans* على البرتقال أبو سرة. وتم تطبيق هذا المركب التجاري بمعدلات 1، 2 و 3 كغ للفدان في شهر أيار/مايو 2004 مقارنة بالمبيد النيماتودي كاربوفوران 10% محبب بمعدل 40 كغ/فدان وبالأشجار غير المعاملة. تبين من نتائج التجربة أن المعدل المتوسط (2 كغ/فدان) من المركب التجاري المستخدم أدى إلى تخفيض الكثافة العددية لليرقات في التربة وكذلك الإناث في جذور الحمضيات/الموايح بنسبة تصل إلى 47.9 و 40.3%، على التوالي، يليها المعدل المرتفع (3 كغ). كذلك أدى المبيد النيماتودي كاربوفوران إلى تخفيض عدد اليرقات في التربة والإناث في الجذور بنسبة 12.9 و 44.4%، على التوالي، وذلك بعد شهر من المعاملة. وفي فترة الحصاد أدى المعدل المتوسط من المبيد الحيوي إلى خفض الكثافة العددية ليرقات النيماتودا في التربة بنسبة 70.8% يليه المعدل المرتفع. وبالنسبة لمحصول الثمار فقد أدى المعدل المتوسط من المادة الحيوية إلى زيادة كل من عدد الثمار ووزنها لكل شجرة وكذلك وزن الثمار لكل فدان وذلك بنسبة 180، 180 و 181.3%، على التوالي، يليها المعدل المرتفع. وقد أدى استخدام المبيد النيماتودي إلى زيادة مقدارها 30، 30 و 31.3% في الخصائص الثمرية السابقة للثمرة، على التوالي.

BC 34

إفرازات جذور الذرة الشامية وعلاقتها بنشاط بعض الفطريات الممرضة للنبات وبكتيريا *Azotobacter chroococum*. عادل الصادق أحمد اسماعيل، بهاء الكردي أحمد الليثي وسحر محمود الباز، معهد بحوث أمراض النبات، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: ranahm58@hotmail.com

تم دراسة تأثير إفرازات جذور الذرة الشامية في نمو بعض الفطريات الممرضة للنبات خصوصاً *Cephalosporium maydis* Samra, Sabet and Hingorani و *Fusarium moniliforme* Sheldon) وعلى أعداد بكتيريا *Azotobacter chroococum* المتواجدة في التربة الزراعية. تم تحليل كيميائي لهذه الإفرازات الجذرية ووجد أنها احتوت على عشرة أحماض أمينية وسكريات مختزلة وغير مختزلة وفينولات حرة ومرتبطة وثمانية أحماض عضوية. واتضح أن مفرزات الجذور قد تناسبت طرداً مع عمر النبات وقد أدت هذه المفرزات إلى زيادة الوزن الجاف لميسليوم الفطريات الممرضة وإلى زيادة أعداد خلايا بكتيريا *Azotobacter chroococum* المثبتة للتروجين. واتضح أن الصنف هجين فردي عشرة ينتج مفرزات جذرية أكثر من الصنف البلدي، وأن إفرازات جذور الصنف الأول المقاوم كانت أقل تأثيراً من تلك المفرزة من الصنف البلدي من حيث تأثيرها في الوزن الجاف لميسليوم الفطريات.

BC 30

دراسة فاعلية مجموعة من عزلات تريكودرما في مكافحة الحبوية لمرض ذبول الحمص المتسبب عن الفطر *Fusarium oxysporum f.sp. ciceris* مع دراسة الخصائص الزراعية والجزيئية لهذه العزلات. هدى بورغدة، زاوي بوزناد وسليم بن كراوش، قسم علم النبات، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر، البريد الإلكتروني: houdabouregghda@yahoo.fr

يعد مرض ذبول الحمص المتسبب عن الفطر *Fusarium oxysporum f.sp. ciceris* من الأمراض المهمة التي تصيب محصول الحمص والمنقلة عن طريق التربة. يعد استعمال السلالات المقاومة من نبات الحمص من أهم طرق مكافحة، لكن استعمالها يبقى محدوداً بسبب الظهور المستمر لعزلات جديدة للفطر المسبب للمرض أكثر شراسة والتي بإمكانها كسر هذه المقاومة. وفي هذه الدراسة، تم إجراء مقارنة لفاعلية القدرة التضادية لمجموعة من العزلات تنتمي إلى ثلاث أنواع من جنس تريكودرما (*T. longibrachiatum*, *T. harzianum* و *T. atroviride*) إزاء الفطر المسبب للمرض في المختبر، وذلك من حيث دراسة فاعلية العزلات في تقليل النمو وإنتاج الأبواغ من خلال التقليل من شدة الإصابة بالمرض، وذلك تحت ظروف البيت الزجاجي. بينت النتائج أن هناك فرق معنوي بين فاعلية العزلات التي تنتمي إلى أنواع مختلفة من جنس تريكودرما في المختبر وفي البيت الزجاجي، كما أن الاختلاف كان جلياً أيضاً بين العزلات التي تنتمي إلى ذات النوع. كما أن دراسة الخصائص الزراعية والجزيئية لهذه العزلات بواسطة تقنية RAPD أظهرت من جهة اختلاف واضحاً بين عزلات تريكودرما التي تنتمي إلى أنواع مختلفة ومن جهة أخرى بين العزلات التي تنتمي إلى ذات النوع. وهذا ما يمكن من تفسير التباين الواضح للقدرة التضادية لهذه الأخيرة إزاء الفطر المسبب للمرض تحت ظروف المختبر والبيت الزجاجي من خلال التقليل في شدة الإصابة بالمرض.

BC 31

آليات المقاومة المستحثة بـ"البیون" في نباتات البندورة/الطماطم ضد الفطر *Phytophthora infestans*. محمود محمد محمد عطية¹، هنرش بوخناور²، أحمد زكي علي¹ ومحمد ابراهيم أبو زيد¹. (1) قسم النبات الزراعي وأمراض النبات، كلية الزراعة، جامعة الزقازيق، الزقازيق، مصر، البريد الإلكتروني: usamaatia2@yahoo.com؛ (2) معهد الطب النباتي (360)، جامعة هوهن هايم، ص. ب. 70599، شتوتجارت، ألمانيا.

أدت المعاملة بتركيزات مختلفة من "البیون" إلى استحثات المقاومة موضعياً (على الأوراق المعاملة) وجهازياً (على الأوراق العليا غير المعاملة للنبات نفسه) إزاء العدوى بالفطر على الأوراق المنزوعة والنباتات الكاملة. وقد استمر التأثير لمدة 14 يوماً موضعياً وجهازياً. في حين لم يكن للبیون تأثير في تحرر الأبواغ/الجراثيم الهدبية أو انبات الأبواغ/الجراثيم السابحة مع العلم بأنه أثر جزئياً في نمو الفطر *Phytophthora infestans*. وأظهرت دراسة آليات استحثات المقاومة بالبیون أن المعاملة بالبیون تؤدي لزيادة نشاط إنزيم البيروكسيداز موضعياً وجهازياً مقارنة بالنباتات غير المعاملة، وكان أعلى نشاط بعد 36 و 48 ساعة من المعاملة. و أدت المعاملة أيضاً لتحفيز السوبر-أوكسيد حيث قدر بالصينغ عن طريق النيتروبلو تترازوليم، وكذا فوق أكسيد الهيدروجين حيث قدر بالصينغ عن طريق 3-3 داي أمين بنزادين هيدروكلوريد. كما زاد محتوى حامض الساليسيليك الحر والكلبي في أنسجة الأوراق المعاملة. وقد أدت المعاملة بالبیون إلى تراكم أنواع من البروتين المرتبط بالدفاع ضد المرض والمعروف بالبروتين المرتبط بالإصابة مثل البيا 1 و 3 جلوكونيز والكيتينيز والبروتين 14 موضعياً وجهازياً. ومن خلال تلك الدراسة يتضح أنه توجد علاقة بين المعاملة بالبیون وإنتاج أنواع الأكسجين الحر النشط مثل السوبر-أوكسيد وفوق أكسيد الهيدروجين، وكذا المحتوى العالي من حامض الساليسيليك الحر والكلبي في أنسجة الأوراق وتراكم البروتين المرتبط بالدفاع ضد المرض والتي قد تسهم في تفسير آلية استحثات المقاومة الموضعية والجهازية بالبیون في نباتات البندورة/الطماطم في حين أن البیون لا يؤثر مباشرة في نمو وإنبات أبواغ/جراثيم الفطر.

BC 32

المكافحة الأحيائية لكل من نيماتودا تعقد الجذور *Meloidogyne javanica* والنيماتودا الكلوية *Rotylenchulus reniformis* باستخدام فطريات التريكودرما. أمين وقدي أمين¹ وفرديوس السيد معروف بخاري². (1) قسم الحيوان والنيماتولوجيا، كلية الزراعة، جامعة القاهرة، مصر، البريد الإلكتروني: Amin_Amin280@yahoo.com؛ (2) قسم علوم الحياة، كلية العلوم، جامعة الملك عبد العزيز، المملكة العربية السعودية.

تمت دراسة خمسة أنواع من فطريات التريكودرما (*Trichoderma harzianum*، *T. viride*، *T. koningii*، *T. reesei* و *T. hamatum*) المنماة في بيئة سائلة كراشح فطري في المختبر بغرض استخدامها كمنتج حيوي لدراسة نشاط وحركة كل من النيماتودا الكلوية *Rotylenchulus reniformis* وبيض ويرقات نيماتودا تعقد الجذور *Meloidogyne javanica* لمدة أسبوع من التعريض في أطباق بتري. ثم نقل كمية منها إلى نباتات البانجان صنف "بلاك بيوتي" عمر شهر مزروعة في تربة طمية رملية بنسبة 1:1 في أصص بلاستيك قياس 12 سم تحتوي على 1 كغ تربة عند درجة حرارة 30±5°س. تركت

واسط) بعد أربعة أشهر من الإطلاق. أما في محافظة واسط فكانت كفاءة المفترس أفضل، حيث انخفضت الإصابه من 23.64 إلى 6.06 بيضة/ورقة ومن 78.01 إلى 3.54 حورية /ورقة (للموقع الأول) ومن 26.02 إلى 16.26 بيضة /ورقة ومن 48.19 إلى 16.00 حورية /ورقة (للموقع الثاني) ولنفس الفترة. كذلك سجل ازدياد كثافة أطوار المفترس تزامناً مع تقدم الوقت وتراكم جرع الإطلاق. في حين أشارت المعطيات الحقلية إلى تذبذب كثافة المفترس خلال أشهر الدراسة تبعاً للظروف المناخية السائدة والعائل. سجلت نروتين ربيعية -خريفية للمفترس على *A. jasmini* على الحمضيات وبمعدل 2.6-2.16 كاملة/ورقة عند درجات حرارة صغرى وعظمى ورطوبة نسبية 8°س، 23°س و 44%، على التوالي. بينما تراوحت كثافة المفترس على *T. ricini* من 1.16-4.83 كاملة/ورقة كذروة ربيعية ومن 1.75-23.5 كاملة/ورقة كذروة خريفية يقابلها 5.9°س، 12.2°س و 62%، 5°س، 20.8°س و 36% للذروة الربيعية و 20.5°س، 43.7°س و 35%، 16.8°س، 33.5°س و 52% درجة حرارة صغرى وعظمى ورطوبة نسبية، على التوالي للذروة الخريفية. وهذا يشير بشكل واضح لتفضيل المفترس *C. arcutus* لذبابه الخروج *T. ricini* بالمقارنة بذبابه الياسمين *A. jasmine*.

BC 28

المكافحة البيولوجية وتطور القراديات الصفر *Tetranychus urticae* Koch على زراعة الذرة الكلتية ووضع استراتيجيات لمكافحة هذه الآفة بالمغرب. سمير فخور، المعهد الجهوي للبحث الزراعي لتادلة، ص.ب. 567، 23000 بني ملال، المغرب، البريد الإلكتروني: sfakhour@caramail.com

أثبتت النتائج المتحصل عليها أن انتشار القراديات الصفر *T. urticae* في حقول الذرة، يبدأ خلال الطور الفينولوجي (4 أوراق) (الطور المستقبل) عن طريق هجرة بعض الأفراد من الأعشاب الضارة المحيطة بحقول زراعة الذرة. ونظراً للظروف المناخية طورت القراديات الصفر العديد من الأجيال التي مكنتها من إصابة كل النباتات في الطور الفينولوجي (12 ورقة). أبدت القراديات المفترسة المنتمة لصنف *Phytoseiulus persimilis* كفاءات عالية في مهاجمة القراديات الصفر بالرغم من الظروف المناخية التي لم تكن ملائمة لتطورهما بشكل سريع. برهنت الأبحاث التجريبية التي أجريت لمقارنة ثلاثة أنواع من الذرة بعد خضوعها لثلاث طرق للمكافحة بأن المكافحة الكيميائية لوحدها لم تمكن من تقليص الأضرار الكيفية والكمية للنوعين من ذوي الدورة النباتية المتوسطة V2 و V3 باستثناء النوع ذو الدورة القصيرة VI؛ كما برهنت طرق المكافحة المتكاملة والبيولوجية على نتائج مشجعة عند جميع أنواع الذرة، في حين تبقى المكافحة المتكاملة ذات النسبة 5 القراديات المفترسة المنتمة لصنف *Phytoseiulus persimilis* لكل 10 من القراديات الصفر الطريقة الأمثل لمكافحة هذه القراديات. أظهرت النتائج أيضاً أن القراديات المفترسة المنتمة لصنف *P. persimilis* ذات كفاءات عالية في مكافحة القراديات الصفر رغم عدم ملائمة الظروف المناخية لتطورهما بشكل سريع. ويمكن رفع فعاليتها بتدخل كيميائي اعتماداً على مبيدات غير ضارة بها.

BC 29

حساسية بعض أصناف التبغ للإصابة بالمعقد المرضي لنيماتودا تعقد الجذور *Meloidogyne javanica* والفطرين *Fusarium solani* و *Macrophomina phaseolina* ومكافحتها احيائياً وكيميائياً. باسمه جورج انطون، زهير عزيز اسطيفان ومنى حمودي الجبوري، قسم بحوث وقاية النبات، الهيئة العامة للبحوث الزراعية، أبو غريب، بغداد، العراق، البريد الإلكتروني: basimanematod@yahoo.com

نفذت دراسة التأثير ما بين نيماتودا تعقد الجذور *Meloidogyne javanica* وفطري التربة *Fusarium solani* و *Macrophomina phaseolina* على حساسية 4 أصناف من التبغ (بغداد، سومر، ربيع، محلي شرقي) ومكافحة هذا المعقد المرضي احيائياً وكيميائياً داخل المظلة الخشبية التابعة لقسم بحوث وقاية النبات، الهيئة العامة للبحوث الزراعية، أبو غريب، بغداد، العراق. كانت معاملة المعقد المرضي أكثر تأثيراً في تدهور جميع الأصناف فيما يخص معايير النمو لنباتات التبغ وبفروق معنوية عن بقية المعاملات والشاهد. وكانت حساسية هذه الأصناف بالمعقد المرضي للنيماتودا مع الفطر *F. solani* أشد تأثيراً لمعايير النمو من معاملة النيماتودا مع الفطر *M. phaseolina*. كذلك أثبتت النتائج قدرة كل من مادة الفورفورال، مسحوق أوراق التبغ 4 غ/أصيص، المبيدين الإحيائيين *Paecilomyces lilacinus* و *Trichoderma harzianum*، مسحوق أوراق التبغ 2 غ/أصيص والمبيد الكيميائي كاربوفوران على السيطرة، ولكن بدرجات متفاوتة، على الفطرين المرضيين *Fusarium* و *Macrophomina* أو تداخلهما مع نيماتودا تعقد الجذور، وذلك عند إضافتها إلى التربة قبل أسبوعين من الزراعة. فمادة الفورفورال كانت أفضل قدرة على تثبيط نشاط الفطرين المرضيين إذ تراوحت ما بين 96.7-100% و 88-100% للنيماتودا. بينما المبيد الكيميائي كاربوفوران كان أقلها قدرة سيما تأثيره في الفطريات، إذ تراوحت نسبة التثبيط ما بين 0-3.3% فقط بينما بلغت 58-82% للنيماتودا.

(Hymenoptera: Braconidae) بأعداد كبيرة وفاعلة. كما لوحظ أن مستوى التطفل يختلف حسب المنطقة والسنة بالإضافة إلى تباينه من موقع إلى آخر في نفس الحقل.

BC 25

تقييم كفاءة أبو العيد ذو السبع نقاط في خفض تعداد من التفاح الصوفي على أشجار التفاح. أشرف عبد السلام هندي منجود، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، السدقي، جيزة، مصر، البريد الإلكتروني: ashrafhendy2001@yahoo.com

يعتبر من التفاح الصوفي من أكثر الآفات إصابة لأشجار التفاح خاصة الأشجار المطعمة على أصول بلدي في مصر. يرتبط بهذا النوع من المن بمفترس قوي وهو مفترس أبو العيد ذو السبع نقاط. وقد أجري هذا البحث لتقييم معدلات مختلفة (30، 60 و 90 بيضة موضوعة على كروتون) في خفض تعداد من التفاح الصوفي على أشجار التفاح بمحافظة القليوبية خلال عامين متتاليين 2004، 2005. أدى إطلاق هذا المفترس بمستوي 30 بيضة/شجرة إلى خفض الإصابة بمن التفاح الصوفي بنسبة وصلت أقصاها إلى 72.3% وذلك في بداية تشرين الثاني/نوفمبر خلال عام 2004. بينما كان إطلاق هذا المفترس بمستوي 60 بيضة/شجرة إلى خفض من التفاح الصوفي بنسبة وصلت أقصاها إلى 87.3% وذلك في بداية تشرين الثاني/نوفمبر 2004. وأخيرا فقد أدى إطلاق المفترس بمستوي 90 بيضة/شجرة أدى إلى خفض من التفاح الصوفي بنسبة وصلت أقصاها إلى 95.5% وذلك في بداية تشرين الثاني/نوفمبر 2004. كما أدى إطلاق هذا المفترس بذات المستويات السابقة 30، 60 و 90 بيضة/شجرة إلى خفض نسبة الإصابة بمن التفاح الصوفي بنسبة وصلت أقصاها إلى 77.1، 90.1 و 96% وذلك في بداية تشرين الثاني/نوفمبر 2005. ومن النتائج السابقة يمكن استخدام مفترس أبو العيد ذو السبع نقاط بنجاح كأحد عناصر مكافحة البيولوجية كما يعتبر عنصر فعال في برامج مكافحة المتكاملة لمن التفاح الصوفي على أشجار التفاح.

BC 26

تأثير حجم كتلة بيض حفار ساق الذرة في كفاءة المتطفل *Telenomus busseolae* Gahan. جاسم خلف محمد وعبد الستار عارف علي، الهيئة العامة للبحوث الزراعية، ص.ب. 39094، أبو غريب، بغداد، العراق، البريد الإلكتروني: Jasim_Aljanabi1968@yahoo.com

يعد المتطفل *Telenomus busseolae* Gahan (Hymenoptera: Scelionidae) من العوامل الرئيسية المؤثرة في حفار ساق الذرة *Sesamia cretica* Led. في معظم مناطق إنتشاره في العراق. ولهذا المتطفل القدرة على البحث والوصول إلى كتل بيض الحفار المحمية تحت أعواد نبات الذرة. وتعتمد نسبة التطفل على عدد بيض العائل المتوفر وعدد الإناث الموجودة في الحقل وتأثير الظروف البيئية فيها. نفذت الدراسة الحالية لمعرفة توزيع ونسب تواجد أحجام كتل بيض حفار ساق الذرة خلال مراحل نمو المحصول وعلاقتها بنسبة التطفل بالنوع *Telenomus busseolae*. أشارت النتائج أن الكتل التي تحوي على 1-25 بيضة هي الأكثر وجودا في الحقل. وقد تبين وجود علاقة عكسية بين عدد البيض في الكتلة الواحدة ونسبة التطفل، إذ انخفضت نسبة التطفل في الكتل الكبيرة التي تحوي على أكثر من 35 بيضة. وقد لوحظ وجود تأثير واضح لمرحلة نمو المحصول في نسبة التطفل. حيث كانت منخفضة في شهر آب/أغسطس عندما كانت النباتات في مراحل نموها الأولى ولكنها ارتفعت بشكل كبير وتجاوزت 90% في حالات عدة خلال شهر أيلول/سبتمبر. إن كفاءة المتطفل في اكتشاف ومهاجمة بيض الحفار المحمي بين الأعواد تستدعي أهمية المحافظة عليه وتعزيز الوسائل التي تساعد على استخدامه في برامج مكافحة حفار ساق الذرة في العراق.

BC 27

بنية وكفاءة المفترس المحلي *Clitostethus arcutus* Rossi في السيطرة على ذبابة الياسمين البيضاء *Aleuroclava jasmini* (Takahashi) على الحمضيات. نزار نومان حمه، أمال سلمان عبد الرزاق، أحمد عطية عافي، ليث عادل محمد ونداء سعود عبد، المركز الوطني للإدارة المتكاملة للآفات الزراعية، الهيئة العامة للبحوث الزراعية، وزارة الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: nazar_sbar@yahoo.com

كجزء من متطلبات برنامج الإدارة المتكاملة لذبابة الياسمين البيضاء (*Aleuroclava jasmini*) على الحمضيات، نفذت محاولة لإكثار الدعسوقة *Clitostethus arcutus* تحت الظروف المسيطر عليها. أطلق المفترس على ثلاث جرعات تطعيمية شهرية وبمعدل 8 كاملة /شجرة في أربعة بساتين حمضيات في محافظتي ديالى وواسط خلال الموسم الزراعي 2006/2005. انخفضت معدلات الإصابة بأطوار ذبابة الياسمين من 31 إلى 14.81 بيضة/ورقة ومن 4.67 إلى 10.98 حورية/ورقة (للموقع الأول- ديالى) ومن 20.60 إلى 3.11 بيضة/ورقة ومن 2.7 إلى 3.95 حورية/ورقة (للمواقع الثاني-

80% مقارنة بالمبيدات الكيميائية. بالإضافة لذلك، وجد إمكانية استخدام المركبات البيولوجية للنيماتودا مع المركبات الكيميائية ضد الحشرات الزراعية بهدف زيادة الفاعلية تحت بعض الظروف.

BC 22

إختبارات على تأثير النيماتودا الممرضة للحشرات ضد دودة ورق القطن *spodoptera littoralis* Biosd. ودودة الشمع *Galleria mellonella* (L). عاطف سيد عبد الرازق¹ ومحفوظ عبد الجواد²، (1) قسم آفات ووقاية النبات؛ (2) قسم أمراض النبات، المركز القومي للبحوث، شارع التحرير، الدقي 12622، القاهرة، مصر، البريد الإلكتروني: abdelrazek820@yahoo.com

تم دراسة فاعلية سبعة أنواع من النيماتودا الممرضة للحشرات من عائلتي Steinernematidae و Heterorhabditidae ضد العمر الأخير من يرقات دودة ورق القطن ودودة الشمع الكبرى وذلك بإختباري أطباق بتري وأعمدة الرمل. أعطى تركيز 100 طور معدي من أنواع *Heterorhabditis* sp. سلالة ELG، *H. indica*، *Heterorhabditis* sp. سلالة ELB في إختبار أطباق بتري نسبة موت 100% ضد يرقات دودة ورق القطن بعد 24 ساعة من بداية المعاملة، وتراوحت نسبة الموت عند باقي أنواع النيماتودا ما بين 50 و 90% بعد 24 ساعة و 100% بعد 48 ساعة من بداية المعاملة. وأعطت السلالات من نوع *Heterorhabditis* sp. (سلالة ELB)، *S. riobravae* و *S. carpocapsae* أعلى كفاءة بنسبة موت 100% ليرقات دودة ورق القطن بعد 24 ساعة من المعاملة في حالة إختبارات الأعمدة الرملية. أظهرت الإختبارات ضد دودة الشمع الكبرى أن السلالة من نوع *H. indica* أعطت أعلى كفاءة في إختبارات أطباق بتري، بينما كانت سلالة *H. egyptii* الأعلى في الكفاءة في إختبارات أعمدة الرمل. وكانت النيماتودا *Heterorhabditis* sp. (نوع ELB) الأكفا من حيث معدل الإختراق 62.3%، تلاها في الأهمية نوع *S. carpocapsae* (61.4%) ضد دودة ورق القطن في إختباري أطباق بتري والأعمدة الرملية على التوالي. وفي حالة دودة الشمع الكبرى كانت أنواع *Heterorhabditis* sp. (ELG) و *S. riobravae* الأكفا وبلغ معدل إختراقها 68.3 و 65% في إختباري أطباق بتري وأعمدة الرمل، على التوالي.

BC 23

المكافحة الحيوية لذبابة الخوخ (*Bactrocera zonata*) باستخدام النيماتودا الممرضة للحشرات *Steinernema feltiae* cross N 33. محمد عبد النعيم محمد عثمان ومحمود فرج محمود، قسم وقاية النبات، كلية الزراعة، جامعة قناة السويس، الاسماعيلية، مصر، البريد الإلكتروني: naeim70@hotmail.com، mfmfmousa@hotmail.com

أجريت التجارب المخبرية لتحديد مدى كفاءة وفاعلية النيماتودا الممرضة للحشرات *Steinernema feltiae* وذلك على كل من العمر اليرقي الثاني والثالث وعلى العذارى عمر يوم وأربعة وستة أيام لذبابة الخوخ *Bactrocera zonata* في أطباق بتري تحتوى على أوراق ترشيح رطبة. اتضح من خلال التجارب أن نسبة الموت في العمر اليرقي الثالث بعد 72 ساعة من المعاملة بتركيزات النيماتودا الحشرية تراوحت بين 32-88% و 8-56% للعمر اليرقي الثاني، بينما كانت نسبة الموت في العذارى كالتالي 4-56% للعذارى عمر يوم واحد، 0-32% للعذارى عمر 4 أيام، 0-20% للعذارى عمر 6 أيام. تم حساب كل من خط السمية وكذلك LC_{20} ، LC_{50} و LC_{90} . تراوحت قيمة خط السمية ما بين 1.25-1.44 ليرقات العمر الثاني ويرقات العمر الثالث، وبلغت 1.1، 1.6، 0.97 لكل من العذارى عمر يوم، 4 و 6 أيام، على التوالي. أوضحت النتائج أن يرقات العمر الثالث وكذلك العذارى عمر يوم لذبابة الخوخ كانت أكثر حساسية للإصابة بالنيماتودا الحشرية بالمقارنة مع يرقات العمر الثاني وكذلك العذارى عمر 4 و 6 أيام عند كل التركيزات (50، 100، 200، 400 و 800 نيماتودا حشرية).

BC 24

المكافحة الحيوية لدبور الحنطة المنشاري (*Hymenoptera: Cephidae*) في شمالي سورية. محمد عزت الغنوم¹، نايف السلتي² وجمعة ابراهيم². (1) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: I.Ghannoum@cgiar.org؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية.

يعتبر دبور الحنطة المنشاري من الآفات الحشرية الرئيسية على محصولي القمح والشعير في شمال سورية، إذ تتغذى يرقاتها على محتويات ساق العائل مؤدية إلى تشكل سنابل فارغة أو ذات حبوب ضامرة. وتتجه اليرقة في طريقها إلى أسفل الساق وتشكل حجرة تقضي فيها بياتها الشتوي بطور اليرقة المكتملة النمو مؤدية إلى نقص الساق وفقد جزء هام من المحصول. إحدى الطرق المهمة في الإدارة المتكاملة المستعملة لتنظيم مكافحة مجتمعات هذه الحشرة تكمن باستعمال العدو الطبيعي. لذلك تم مسح عدد من الحقول لتحديد مستوى الإصابة والنوع المتطفل الأكثر إنتشاراً على هذه الآفة. وجدت *Collyria coxator* Villers (*Hymenoptera: Ichneumonidae*) و *Bracon terebella* Wesmal

البكتيولوفيروس المضادة للأفات مثل: *Spodoptera littoralis*, *Helicoverpa armigera*, *Cryptophlebia leucotreta* و *Spodoptera exigua*.

BC 19

التأثير النسيجي المرضي لمستحضرات البكتيريا *Bacillus thuringiensis* (Berliner) ضد دودة اللوز الشوكية والقرنفلية. سليم محمد طاهر خوجة¹، جورج نصرالله رزق²، مديحة أبو المكارم رزق² وحمد السعيد محمد حنفي². (1) مركز البحوث العلمية الزراعية بحلب، حلب، سورية، البريد الإلكتروني: khoja90@maktoob.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة عين شمس، شبرا الخيمة، القاهرة، مصر.

أجريت تجارب مخبرية لدراسة تأثير اثنين من مستحضرات البكتيريا *B. thuringiensis* (دايل و برونكتو) على المعى الأوسط ليرقات دودة اللوز الشوكية والقرنفلية والتغيرات الحاصلة فيه. وتم تغذية يرقات حديثة الفقس على بيئة غذائية صناعية معاملة بتركيز 1 غ/لتر من المستحضرات التجارية لمدة يومين، ثم نقلت إلى بيئة غذائية صناعية سليمة غير معاملة لمدة ثمانية أيام. أخذت اليرقات المصابة بعد ذلك وتم عمل مقاطع في المعى الأوسط لدراسة التغيرات النسيجية المرضية. أظهرت النتائج بوضوح العديد من التغيرات النسيجية المرضية في المعى الأوسط بالمقارنة مع الشاهد. لوحظ عند تقطيع المعى الأوسط لليرقات المصابة انفصال كامل للخلايا الطلائية عن الغشاء القاعدي وتقطع بعض الخلايا الطلائية والغشاء حول غذائي، وانكماش معظم الخلايا الطلائية، وتمزق في العضلات.

BC 20

استخدام الفطور الممرضة للحشرات: طرائق واعدة لإدارة متكاملة لحشرة السونة. بروس باركر¹، ماركاريت اسكزرا¹، مصطفى البوحسيني²، بيل ريد¹، ديفد مور³، س. إيدينغتون³ وزياد صيادي² (1) مخبر أبحاث الحشرات، جامعة فيرمونت، بورلنغتون، الولايات المتحدة الأمريكية 3400-05405؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: z.sayyadi@cgiar.org؛ (3) CABI للعلوم الحيوية، المملكة المتحدة.

تعتبر حشرة السونة *Eurygaster integriceps* Puton آفة حشرية شديدة الضرر للقمح في وسط وغرب آسيا. طورت إيكاردا بالتعاون مع شركائها في مراكز البحوث الزراعية الوطنية في وسط وغرب آسيا، إلى جانب جامعة فيرمونت (الولايات المتحدة الأمريكية) و CABI للعلوم الحيوية (المملكة المتحدة)، خيارات إدارة متكاملة لحشرة السونة، ويشكل استعمال الفطور القاتلة للحشرات العمود الفقري لاستراتيجية مكافحة. جمعت 250 عزلة فطرية من أماكن بيئات حشرة السونة في وسط وغرب آسيا، كما جمعت 7 عزلات من *Beauveria bassiana* من بالغات الجيل الجديد للسونة من حقول القمح في تركيا وسورية، وتشكل هذه أكبر عملية جمع للفطور الممرضة لحشرة السونة في العالم. وكان أكثر الأنواع المعزولة شيوعاً النوع *B. bassiana*. يمكن أن ينتج هذا النوع على حبوب النجيليات ويطبق بشكل رخيص بالتعاون مع المزارعين. واعتماداً على الاختبارات الحيوية في المخبر والبيت البلاستيكي والعمل الحقل الأولي، أظهرت عدة عزلات إمكانية كبيرة لاستخدامها كعوامل مكافحة حيوية في أماكن البيئات الشتوي (الشكل الحبيبي) وفي الحقل (الشكل الزيتي). تستهدف استراتيجية الاستخدام الأقرب للشكل الزيتي إلى التطبيق على أطراف الحقول لتصيب البالغات المشتبطة حالما تدخل حقول القمح في الربيع. أشارت النتائج الأولية إلى نسبة قتل < 80% بين عدة عزلات باستخدام معدلات تطبيق حقلية قريبة من معدلات تطبيق الأشكال المصنعة. أشارت أعمال إضافية لاختبار استراتيجيات أشكال مختلفة للتطبيق في كل من أماكن البيئات الشتوي وحقول القمح إلى إمكانية إنتاج هذه الفطور كماً، وسوف لن تكون مرتفعة الثمن وبسيطة التطبيق. وسيوصى بالعزلات الفطرية الواعدة وبالصيغ المناسبة لإدارة حشرة السونة، إلى جانب الخيارات الأخرى للإدارة المتكاملة للأفات.

BC 21

دور النيماطودا الممرضة للحشرات في ضبط تعداد الآفات الحشرية. محمد بن مسلم علي هيبس، محطة البحوث الزراعية بصلالة، ص.ب. 2773، صلالة 211، سلطنة عمان، البريد الإلكتروني: hugir1966@yahoo.com اكتسبت النيماطودا الممرضة للحشرات في الأونة الأخيرة أهمية كبيرة في مكافحة الأحيائية وذلك لفاعليتها ضد الكثير من الآفات الحشرية الزراعية. تمت دراسة النيماطودا الممرضة للحشرات في مناطق مختلفة من محافظة ظفار، حيث عزلت 10 عزلات من عائلتي *Steinernema* و *Heterorhabditis*، وتمت دراسة الخصائص البيولوجية لهذه الأنواع والعلاقات البيولوجية بالنسبة للأطوار الحشرية المختلفة. كما تم اختيار الوسط الغذائي الصناعي والطبيعي بهدف الإكثار الكمي للأطوار المعديّة. أظهرت النتائج تحت ظروف سلطنة عمان، أن أعلى معدل كان خلال الأشهر من آذار/مارس - نيسان/أبريل وأيلول/سبتمبر - تشرين الأول/أكتوبر بمعدل تراوح ما بين 27.9-46.4%. وكانت المركبات النيماطودية أفضل بنياً وإقتصادياً من المركبات الكيميائية، حيث وصلت فعالية المركبات النيماطودية إلى أكثر من 60% ومدى أمان استخدامها إلى أكثر من

BC 16

تأثير بعض المواد الحيوية ضد حشرة *Bruchus rufimanus*. م. م. صبور وشادية عبد العزيز، قسم الوبائيات ووقاية النبات، المركز القومي للبحوث، الدقي، القاهرة، مصر، البريد الإلكتروني: sabbourm9@yahoo.com
تعدّ المواد المخزونة مصدرا للبروتينات في مصر، ولكنها تصاب ببعض الحشرات مما يؤدي إلى نقص محتواها من البروتين. تعدّ *Bruchus rufimanus* من أهم الحشرات في الحقل والمخزن. أجريت دراسة مخبرية لمكافحة هذه الحشرة عن طريق استخدام 5 أنواع من الزيوت النباتية (البنزلهديد، زيت البصل، زيت الخردل، زيت القرنفل وحبّة البركة). دلت النتائج على أن زيت البصل يقلل نسبة الإصابة بالحشرة عند تركيز 0.5% إلى 5.8±50.6. وعند استعمال أنواع مختلفة من الأكياس (مصنوعة من السولوفان والبلاستيك وورق الذبذبة وورق الألمونيوم وأكياس الورق المقوى والخيش) أثناء التخزين وبعد معاملتها بالزيوت المختبرة، تبين أن الإصابة بالحشرة قد انخفضت أثناء التخزين في الأكياس المعاملة بزيت حبة البركة تلاه أكياس السولوفان ثم بزيت البصل. كما انخفضت نسبة الإصابة في الحقل إلى 20، 21 و 25% بعد 20 يوما من معاملة نبات الفول بكل من زيت حبة البركة، البنزلهديد وزيت البصل، على التوالي.

BC 17

تقييم فاعلية الإبادة الحيوية لعزلات جغرافية تونسية للفيروس الحبيبي (Baculoviridae) الممرض لفراشة درنات البطاطا/البطاطس (*Phthorimaea operculella* Zell.) وتأثيره في عملية التطور لدى الشرنقة. محمد ماهر بن لطيفة¹، أسماء العريف²، سامي فتوش³ ومحمد الحبيب بن حمودة^{1,2}. (1) المدرسة العليا للبستنة و تربية الماشية بشط مريم، ص. ب. 47، شط مريم، 4042، تونس، البريد الإلكتروني: mohamed.maher.beltaifa@gmail.com؛ (2) المعهد الوطني للبحوث الوطنية بتونس (PRRD-CM)، شارع 7050، 2080 أريانة تونس؛ (3) مخبر الهندسة البيولوجية، المعهد الوطني للبحوث التطبيقية والتكنولوجيا، تونس.

في هذا البحث وقع تجربة 10 عزلات جغرافية مرقمة من 1 إلى 10 للفيروس الحبيبي من عائلة العصويات والممرضة لفراشة درنات البطاطا (Lepidoptera : Gelechiidae) والتي وقع جمعها من أهم المناطق المنتجة للبطاطا في تونس والتأكد من حملها للفيروس بواسطة تقنية اليزا من قبل الدكتور أسماء العريف في عمل سابق. وضعت يرقات جديدة النفس للحشرة على درنات بطاطس ملوثة بجرعات متفاوتة التركيز من هذه العزلات لتحديد مدى فاعليتها في مقاومة آفة فراشة البطاطس/البطاطا. وقد لوحظ أن استعمال جرعة قوية (5 مكافئ يرقة) مكنت من الحصول على نسبة إبادة لليرقات أكبر بثلاث مرات على الأقل مقارنة بالشاهد بالنسبة للعزلات 5 إلى 10. أما في طور الشرنقة فسجلت نسبة موت متوسطة مقارنة مع الشاهد بالنسبة للعزلات الأخرى. ومع التخفيض التدريجي لتركيز العزلات المستعملة لتلوّث درنات البطاطس/البطاطا فقد لوحظ، رغم انخفاض نسبة الموت الكلية للحشرة، فإن استعمال العزلات 1، 6، 7 و 8 مكنت من الحصول على نسبة إبادة على مستوى الشرنقة ما بين 164 و 270% مقارنة مع الشاهد. رافق ذلك طول في مستوى أمد التطور؛ وعمر الجيل وظهور مكثف لعلامات التشوه على مستوى الشرنقة أدى في الغالب إلى موتها مما يدعو إلى التفكير بوجود عامل خاص قادر على تعطيل وتشويش التوازن الفيزيولوجي على مستوى اليرقة.

BC 18

الباكيولوفيروس كعوامل مكافحة للأفات: خبرة من خلال تجاربنا في الماضي ونظرة إلى المستقبل. فيليب كسلر ومارتن أندرمات، شركة Andermatt BIOCONTROL AG، مقرها: 6, Stahlermatten 6146, Grossdietwil، سويسرا، البريد الإلكتروني: kessler@biocontrol.ch

تعدّ الباكيولوفيروسات ممرضات للحشرات، حيث تلعب دورا مهما للغاية في مكافحة الحيوية ضد الحشرات الضارة. وهي انتقائية جدا ولا تنتج مواد سامة أو فضلات ومأمونة. يتم في أوروبا منذ 20 عاما تسجيل وتسويق منتجات مبنية أساسا على الباكيولوفيروسات. وازدادت المساحة التي تطبق فيها منتجات الباكيولوفيروسات في الأونة الأخيرة، وتراوحت بين 2-3 مليون هكتار على المستوى العالمي. ولا يتم استعمال هذه المنتجات فقط في الأنظمة الزراعية العضوية، بل وقد أثبتت أنها من بين أفضل الخيارات الملائمة في حالة الإنتاج المتكامل. وعلى سبيل المثال، طبق الفيروس التحبيبي *Cydia pomonella* في كل أنحاء العالم ليس فقط في حقول الزراعة العضوية بل وأيضا في حقول الإنتاج المتكامل (IP) للسيطرة على دودة ثمار التفاح. وبغض النظر عن كفاءته العالية، عدّ الفيروس التحبيبي *Cydia pomonella* أداة ممتازة لإدارة المقاومة خاصة مع ارتفاع المقاومة تجاه المبيدات الحشرية الكيميائية في الوقت الحاضر. وقد لوحظ ارتفاع المقاومة تجاه الفيروس التحبيبي *Cydia pomonella* بعد الرش الكثيف لسنوات عديدة، ويمكن الحد من هذه الظاهرة باستعمال خلطات جديدة لطرز وراثية من الفيروس التحبيبي. يعدّ الفيروس التحبيبي *Cydia pomonella* دليل قيم على كيفية استخدام الباكيولوفيروس كوسيلة تحكم فعالة ومستدامة ضد الآفات الحشرية. هذا وتم حديثا تسويق أشكال جديدة من

التخزين تحت ظروف المراقبة (درجات الحرارة $2\pm 30^\circ\text{C}$ ونسبة الرطوبة $70\pm 5\%$). بينت النتائج أن بذور الصنفين المحليين (واحة وكبير) كانتا حساسة جداً لتطور حشرة ثاقبة الحبوب الصغرى، بينما أبدى الصنف الإسباني (جاباطو) درجة من المقاومة للحشرة. لا يستعمل عادة الإختبار الحيوي ولا سيما الكائنات الممرضة للحشرات في حماية الحبوب المخزنة، إلا أنه وجد في هذه الدراسة أن لبعض الكائنات المنافسة مثل *Pseudomonas syringae* يمكن أن تؤمن حماية من الإصابة بحشرة ثاقبة الحبوب الصغرى بحدود 100% لمدة 48 ساعة عند استخدامها بتركيز 10.4^7 خلية/مل وعند التخزين على درجة حرارة 10°C . في حين بلغت الحماية 20، 30 و 50% عند التخزين على درجات الحرارة 30، 10 و 0°C ، على التوالي. وبلغت نسبة الموت 40% للحشرات المعرضة إلى جرعات 10.2^6 و 10.2^5 خلية/مل عند درجة حرارة 10°C لمدة 48 ساعة.

BC 14

القدرة الإمراضية للعامل الممرض *Beauveria bassiana* تجاه حشرة الذبابة البيضاء *Bemisia tabaci* على عوائل نباتية مختلفة. عارف عليقة¹ وشون-سيانغ رن¹. (1) مختبر مكافحة الأحيائية، جامعة جنوب الصين للزراعة، كونجو 510642، الصين، البريد الإلكتروني: aolleka@yahoo.com؛ (2) الهيئة العامة للبحوث العلمية الزراعية، دمشق، سورية. لقد أصبحت حشرة الذبابة البيضاء آفة حشرية واسعة الانتشار ومهددة للزراعات المحمية والحقلية. تقدم مكافحة الأحيائية إدارة مستقرة من الناحية البيئية والفعالة لمكافحة الآفات. يمتلك العامل الممرض *Beauveria bassiana* قدرة عالية ضد الذبابة البيضاء. في هذه الدراسة، تم تحديد تأثير العائل النباتي في حساسية الذبابة البيضاء تجاه العامل الممرض. ربيت الحشرات على أربعة أنواع من الخضار (الخيار، البانجان، البندورة/الطماطم والملفوف)، ثم أجريت التجارب في صناديق تحت ظروف محددة بالنسبة لكل من درجة الحرارة $1\pm 26^\circ\text{C}$ والرطوبة النسبية $5\pm 65\%$ لتأمين ظروف ملائمة للعدوى، تم رش حوريات الطور الثاني بمعلق الأبواغ الفطرية بتركيز $10^7 \times 1$ بوغ/مل وتم رش حشرات الشاهد بمحلول مرطب. أظهرت الحوريات استجابة متباينة تجاه العدوى بالمرض بعد عملية رش واحدة، فعلى نباتات الخيار كانت شديدة الحساسية، بينما كانت أقل حساسية على نباتات البندورة/الطماطم وبصورة معنوية. كان معدل الموت في معاملة الشاهد صفر. اختلفت القدرة الإمراضية للعامل الممرض بالاعتماد على العائل النباتي. بعد 10 أيام من المعاملة تراوحت قيم التركيز القاتل لنصف حشرات التجربة بين 5.21×10^4 على نبات الخيار و 3.23×10^6 على نبات الملفوف. تباينت قيم العمر اللازم لموت نصف حشرات التجربة بين 5.76 على نبات الخيار و 8.06 يوم على نبات الملفوف. لقد أظهر نبات الخيار تأثيراً أقل في حساسية الحشرات تجاه الممرض. أثبتت التجارب أن الممرض *B. bassiana* لديه قدرة كاملة عالية لمكافحة حشرة الذبابة البيضاء.

BC 15

اكتشاف كائنات حية دقيقة فطرية وبكتيرية مضادة للفطر المسبب لمرض البيوض على نخيل التمر ولفطريات أخرى. مولاي الحسن سدر، مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، مراكش المغرب، البريد الإلكتروني: mhsedra@yahoo.fr؛ sedramh@menara.ma؛ sedramh@hotmail.com

يعد مرض البيوض أخطر الأمراض ضرراً وتهديداً على نخيل التمر في الوطن العربي على العموم وخاصة في بلدان شمال أفريقيا. انقرضت عدة أصناف تجارية وسلالات جديدة ذات جودة عالية في التمر وقد تنقرض أصناف أخرى من الواحات المغربية بسبب مرض البيوض. من أجل حماية واستغلال هذه الأصناف الثمينة و/أو النادرة أمام عدوى المزارع المتزايد وانتشار المرض بسرعة، فيمكن أن يكون استخدام التربة المقاومة والمكافحة الحيوية من الطرائق الممكنة. أسفرت نتائج البحث عن العثور على عدة كائنات دقيقة عديدة مضادة للفطر المرض تنتمي إلى أجناس مختلفة ومصدرها التربة أوجذور النخلة، وهي قادرة على كبح الفطر الممرض ومنع انبات أبواغه ونموه في التربة. كما أبدت المواد المستمدة من هذه الكائنات الدقيقة المضادة عن قدرتها في تقلص نمو الفطر الممرض في الماء والتربة بالمقارنة مع بعض المواد المستمدة من الكائنات الدقيقة غير المضادة والمبيدات الفطرية. كما تم انتخاب بعض المواد الحاملة لهذه الكائنات الدقيقة والمحافظة عليها، ودرست كيفية تحضيرها واستعمالها. ويهدف معرفة تأثير الكائنات الدقيقة المضادة في الأمراض الأخرى، أبدت التجارب أن بعض هذه الكائنات الدقيقة المختارة أظهرت قدرتها في منع نمو الفطريات الممرضة المتسببة لأمراض متباينة على النخيل مثل تعفن الأزهار وتعفن الأوراق وتعفن التمر وعلى المزروعات الأخرى مثل أمراض ذبول الطماطم/البندورة، البطيخ، الهليون، نخيل الزيت، البسلة والكتان. ويعد اكتشاف هذه الكائنات الدقيقة المضادة والمواد المستمدة منها فتحاً جديداً في مكافحة الحيوية في مجال وقاية وحماية النخيل من مرض البيوض، ويمكن تطبيقها على نماذج أخرى للمزروعات المذكورة أعلاه.

الحموضة الذي يناسب التطور والإنتاج الأفضل للأبواغ هو ما بين 5 و 6. كما لوحظ أن نقص نشاط الماء في الوسط الذي يتواجد به الفطر يؤثر سلباً في تطور هذا الأخير.

BC 11

كفاءة الفطرين *Beauveria bassiana* و *Verticillium lecanii* في مكافحة الأحيائية لحشرة الذبابة البيضاء (*Bemisia tabaci*). حمود مهدي صالح وحسين مكطوف ديوان، مركز المكافحة المتكاملة للآفات الزراعية، وزارة العلوم والتكنولوجيا، ص. ب 765، بغداد، العراق، البريد الإلكتروني: Hamf56@yahoo.com

نفذت هذه الدراسة لمعرفة كفاءة الفطرين *Beauveria bassiana* و *Verticillium lecanii* في التطفل على الأطوار غير البالغة لحشرة الذبابة البيضاء (*Bemisia tabaci*) تحت ظروف الحقل. أوضحت النتائج بـHن الفطر *V. lecanii* قد حقق أعلى نسبة تطفل على حوريات وبالغات الذبابة البيضاء تحت ظروف الزراعة المكشوفة على نباتات البانجان في منطقة النهروان إذ بلغت 73.4% مقارنة بالفطر *B. bassiana*. عزلة رقم 1 و 2 التي مقدارها 56.7 و 50.4%، على التوالي، وذلك بعد 10 أيام من المعاملة. كما أظهر استخدام معلق أبواغ الفطر *V. lecanii* مع مادة Triton بنسبة 0.02% أفضل نتيجة، إذ بلغت نسبة التطفل 90% بعد 10 أيام من المعاملة. أما في تجربة التويئة، فقد أوضحت النتائج بأن الفطر *V. lecanii* حقق أعلى نسبة تطفل بلغت 90 و 80.66% مقارنة مع الفطر *B. bassiana* عزلة رقم 1 و 2 حيث بلغت نسبة التطفل 68.66، 60 و 53.33 و 48% عند استخدام مادة Triton بنسبة 0.02% وزيت الذرة بنسبة 0.2%، على التوالي، وذلك بعد 10 أيام من المعاملة. أما تجربة الزراعة المحمية، فقد أظهرت النتائج بأن استخدام الفطرين *V. lecanii* و *B. bassiana* عزلة رقم 1 معاً حققاً نتيجة أفضل من استخدام أي منهما بمفرده إذ بلغت نسبة التطفل على حوريات وبالغات الحشرة 90% في حين 70.3 و 81% للفطر *V. lecanii* و *B. bassiana* عزلة رقم 1، على التوالي عند استخدامها كلا على إنفراد وذلك بعد 15 يوماً من المعاملة. كما أن حيوية أبواغ الفطرين *V. lecanii* و *B. bassiana* عزلة 1 و 2 تقل بزيادة مدة الخزن. وكان الخزن عند درجة حرارة الغرفة أقل كفاءة من الخزن عند درجة حرارة 40 °س.

BC 12

المكافحة الأحيائية ليرقات بعوض الكيوليكس من نوع *Culex pipiens* بوساطة بعض سلالات النوعين *Bacillus thuringiensis* و *B. sphaericus*. باسمه أحمد عبد الله وأسراء غانم السماك، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: basimaaa138@yahoo.com، anmaraltaee1978@yahoo.com

تضمنت الدراسة عزل وتشخيص ودراسة قدرة النوعين *B. thuringiensis* و *B. sphaericus* على قتل يرقات بعوض الكيوليكس، التي عزلت من أجواء وترب مختلفة في محافظة نينوى باستخدام وسط Nutrient Yeast Salts Medium (NYSMG)، الذي يسمح بنمو أغلب التجمعات البوغية. تم انتقاء عزلات للنوع *B. sphaericus* مقاومة للستربتومايسين عند استخدام الوسط الانتقائي Media Nutrient Yeast Salts Medium Streptomycin (NYSMS) وتبين من حساب أعداد الخلايا النامية ومقارنة الوسطين أعلاه أن الوسط NYSMS يختزل عدد الأبواغ النامية بنسبة 80-90% لأغلب العينات. كذلك درست قدرة هذه العزلات على قتل يرقات البعوض من نوع *Culex pipiens*. أوضحت النتائج أن عزلة واحدة من كلا النوعين أنفي الذكر وكذلك النوع الشاهد *B. thuringiensis* استطاعت قتل 100% من يرقات البعوض خلال اليوم الأول من التحضين عند درجة حرارة الغرفة (30±2°س). واستطاعت عزلة واحدة تابعة للنوع *B. thuringiensis* قتل 100% خلال اليوم الثاني وأن ثلاث عزلات من كلا النوعين أنفي الذكر استطاعت قتل 100% خلال اليوم الخامس وتوسع عزلات تابعة للنوع *B. sphaericus* وثمانية عزلات تابعة للنوع *B. thuringiensis* لم تحدث أية نسبة للقتل خلال فترة التحضين إلى اليوم الخامس.

BC 13

مكافحة ثاقبة الحبوب الصغرى (*Rhizopertha dominica* (F.)) عبد الكريم مباركيه وعبد الهادي قشي، مختبر الميكروبيولوجيا وأمراض النبات، كلية العلوم، جامعة فرحات عباس، سطيف 19000، الجزائر، البريد الإلكتروني: mebarkiabba@yahoo.fr

وجدت حشرة ثاقبة الحبوب الصغرى (*Rhizopertha dominica* (F.)) (Coleoptera: Bostrychidae) بأعداد كبيرة عند دراسة تحديد وتردد الحشرات تحت الشروط النظامية للتخزين في منطقة شبه جافة بسطيف، شرق الجزائر خلال الموسم الزراعي 2004/2003. وتم تحديد التأثير الحقيقي لحشرة ثاقبة الحبوب الصغرى على بذور القمح المخزنة بوساطة وسائل مراقبة ملائمة في الموسم الزراعي 2005/2004، فقدرت نسبة الإصابة بحوالي 15.02%. تمت دراسة مقاومة ثلاثة أصناف من حبوب القمح الصلب لحشرة ثاقبة الحبوب الصغرى، وذلك بإصابتها بمستويات مختلفة بالحشرة ولمدة ثلاثة أشهر من

أنواع كما يلي: 3 سلالات تعود الى نوع *Bacillus thuringiensis* وسلالتان من نوع *B. mycooides* والسلالات *B.adius*، *B. polymyxa* و *B. macerans*. استخدم المعلق البكتيري لهذه السلالات في تركيزين (10×10^3 ، 10×10^6 خلية/مل) وتم مقارنتها مع المبيد الحشري التجاري (Manco Zeb) (المستخدم محليا في تعفير حبوب القمح في محافظة نينوى بتركيز 1 كغ/طن قمح). أظهرت النتائج نسبة عالية من القتل مع ظهور تغييرات بايولوجية غير طبيعية في الطور اليرقي الثالث والذي تغذى على حبوب القمح المعاملة بالمستخلصات البكتيرية الأنفة الذكر. بلغت أعلى نسبة للقتل للمعلق البكتيري العائد لنوعين *B. thuringiensis* و *B. macerans* وبمعدل 90% بعد 96 ساعة تحضين مقارنة بمعدل القتل 70% الذي سببه المبيد الحشري. من ناحية أخرى تم اختبار سمية المعلقات البكتيرية التي سببت أعلى نسبة قتل ليرقات الخنفساء على الفئران الرضية مباشرة عن طريق الإرضاع الفموي، ولم يلاحظ تأثيرات مرضية خطيرة باستثناء التغييرات الطفيفة في حجم المعدة.

BC 8

حصار وتقلب تعداد بعض الآفات التي تصيب الكرات والشبت والبقدونس والمكافحة البيولوجية باستخدام *Beauveria bassiana*. محمد حسن عبد الرحمن سليمان، معهد بحوث وقاية النباتات، شارع نادي الصيد، الدقي، الجيزة، مصر.
تبين من الدراسة أن نباتات الكرات والشبت والبقدونس تصاب بمنّ القطن، ذبابة ورق الفول، والعنكبوت الأحمر ذو البقعتين وتربس القطن. سجل تربس القطن أعلى تعداد ثم يليه العنكبوت الأحمر ذو البقعتين، منّ القطن وذبابة ورق الفول. وكان منّ القطن أعلى تعداد في اليوم السابع والرابع عشر من شهر آذار/مارس 2005/2006، بينما ذبابة ورق الفول سجلت أعلى تعداد في يوم 7 آذار/مارس 2005. أما العنكبوت الأحمر ذو البقعتين فقد سجل أعلى تعداد في يوم 21 آذار/مارس 2005 و 7 نيسان/أبريل 2006 على نباتات الكرات البلدي. كما وجد أن تربس القطن قد سجل أعلى تعداد على النباتات الثلاثة. بخصوص المكافحة البيولوجية باستخدام *Beauveria bassiana* للآفات المتواجدة باستمرار على النباتات المختبرة فقد أوضحت النتائج أن نسبة الخفض كانت تتزايد تدريجياً من اليوم الثالث حتى العاشر. تجهيزة البيوفلاي كانت أفضل من تجهيزة البيوفير (مسحوق قابل للبلل) ضد تربس القطن على نباتات الشبت بينما تجهيزة البيوفير كانت الأفضل فاعلية على تربس القطن والعنكبوت الأحمر ذو البقعتين على نبات الكرات.

BC 9

مقارنة كفاءة التطبيقات الحقلية للبكتيريا *Bacillus thuringiensis* بالليل والنهار في مقاومة دودة ورق القطن (*Spodoptera littoralis*) تحت ظروف الطقس الحار. صادق عبد الواحد سالم، قسم آفات ووقاية النبات، الدقي، القاهرة، مصر، البريد الإلكتروني: Sadeksalem2002@yahoo.com

أجريت سلسلة من التجارب لتقييم وقت وطريقة رش مبيد من بكتيريا *Bacillus thuringiensis* في مكافحة دودة ورق القطن *Spodoptera littoralis* على كل من محصول القطن والذرة. أجريت عملية الرش بالمبيد *B.t. var. galleriae* HD-234 باستخدام المرش الأرضي أو المرش الظهري، مرتين خلال فترة نمو المحصول وكان معدل الرش 750 غ / 600 أو 200 لتر ماء (للمرش الأرضي أو الظهري). بينت الدراسة أن معظم محلول الرش قد توضع على الأوراق وأعلى نسبة موت لليرقات وتوزع أفضل لأبواغ البكتيريا *B.t.* على النبات كان عند استخدام متور الرش 600 لتر. أثبتت التجارب على محصول القطن أن الرش الليلي (حزيران/يونيو) أعطى نتائج أفضل من الرش النهاري كما كانت نسبة موت اليرقات وانخفاض نسبة فقس البيوض وزيادة إنتاج محصول الذرة أفضل (أيلول/سبتمبر). يتميز الرش الليلي عن الرش في النهار باختلاف بسيط بدرجات الحرارة ونسبة بقاء أبواغ البكتيريا حية تكون أفضل من الرش النهاري .

BC 10

تأثير بعض العوامل الفيزيوكيماوية والتغذوية في النمو المشيجي وإنتاج الأبواغ للفطر المضاد الحشري *Beauveria bassiana*. بهية دومانجي متيش¹ وفاطمة الزهراء بساعد². (1) قسم علم الحيوان الزراعي والغابي، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر؛ (2) قسم البيولوجيا كلية العلوم، جامعة محمد بوقرة، ص.ب. 35000، بومرداس، الجزائر، البريد الإلكتروني: bissaad@yahoo.com

تم عزل فطر مضاد حشري محلي *Beauveria bassiana* حشرة تنتمي إلى فصيلة النحليات عثر عليها في رعاية بضواحي الجزائر العاصمة في أيار/أبريل 2006. ولمعرفة خصائص هذا الفطر، تم إختباره على عدة أوساط مغذية (PDA، ميلار-هيلنون، أوكساتراسكلين، GN، ساپورو). كما درست بعض العوامل الفيزيوكيماوية منها درجات الحرارة (10-40°س)، درجة الحموضة (3-9) ونشاط الماء ($0.75-0.99a_w$) على النمو المشيجي وإنتاج أبواغ الفطر. وأظهرت النتائج أنه بعد 15 يوماً من عملية التحضين، أن وسط التغذية المصنوع من PDA كان الأفضل للنمو (4.73 سم) وإنتاج الأبواغ (10×13 بوغ/مل). وكانت درجة الحرارة المثلى لتطور الغزل الفطري وإنتاج الأبواغ في حدود 25°س. ثابت

B. alba, *B. bassiana* ووجد أن كلا من *Zoophthora radicans* و *Panadora neoaphids*، *C. thromboides* و *Z. radicans* كانت سائدة التواجد يليها من حيث درجة السيادة النوعين *P. neoaphids* و *C. obscurus*، في حين كان النوعين *C. coronatus* و *C. thromboides* أقلها تواجداً. وجد أن تواجد جنس *Beauveria* كان من بداية شهر شباط/فبراير حتى الأسبوع الثالث من شهر آذار/مارس مع أعلى حدوث له خلال منتصف شهر شباط/فبراير. أما جنس *Conidiobolus* فقد تم تسجيله بعد الجنس السابق بثلاثة أسابيع. كان تذبذب هذا الجنس من 22 شباط/فبراير حتى 15 آذار/مارس. و جنس *Zoophthora* فقد لوحظ من 15 شباط/فبراير حتى 15 آذار/مارس مع تواجد أعلى حدوث له حدثت في 8 آذار/مارس. أما النوع *Pandora neoaphids* فقد لوحظ اعتباراً من الأسبوع الثالث من شهر شباط/فبراير حتى الأسبوع الثالث من شهر آذار/مارس مع حدوث أعلى تواجد له في منتصف شهر آذار/مارس.

BC 5

التواجد الطبيعي للفطريات الممرضة للحشرات والمعزولة من التربة بأسبوط، مصر. سعد شحاتة محمد المراغي¹، محمد علاء الدين احمد عبد الرحمن²، أحمد يحيى عبد المالك¹ وخالد عبد الله حسين. (1) قسم النبات، كلية العلوم، جامعة أسيوط، مصر؛ (2) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، مصر، البريد الإلكتروني: selmaraghy2@yahoo.com هدفت الدراسة الى إلقاء الضوء على الوجود الطبيعي للفطريات الممرضة للحشرات التي أمكن عزلها من التربة المزروعة بكل من محصولي القمح والقطن بمحافظة أسيوط - مصر. استخدمت يرقات دودة الشمع الكبيرة كطعم لحصر الفطريات. تم عزل وتعريف نوعين هامين من الفطريات الممرضة للحشرات وهما (*Beauveria bassiana* (Bals.) و (*Metarhizium anisopliae* (Metch.) وعند استخدام 2068 يرقة دودة شمع كبيرة، وجد بأن 105 يرقات منها معدية بالفطريات السابقة (ممثلة نسبة 5.08% موت). أما الفطر *B. bassiana* فتم تسجيله على 90 يرقة أخذ منها 90 عزلة، بنسبة تواجد 85.71%. وسجل الفطر *M. anisopliae* على 15 يرقة أخذ منها 15 عزلة، بنسبة تواجد 14.29%. أوضحت الدراسة أن الفطر *B. bassiana* يعتبر من أهم الفطريات الممرضة للحشرات التي يمكن عزلها من التربة بصعيد مصر، في حين أن الفطر *M. anisopliae* كان أقل تواجداً. وتجدر الإشارة إلى أن هذه الفطريات سجلت على مدار العام، إذ كان أعلى نسبة انتشارها خلال أشهر الربيع والخريف. كما أوضحت الدراسة تأثير بعض العوامل البيئية المختلفة على انتشار وتواجد هذه الفطريات.

BC 6

الفطريات الممرضة لحشرات من أوراق الذرة التي تصيب نباتات القمح بأسبوط، مصر. أحمد يحيى عبد المالك¹، محمد علاء الدين احمد عبد الرحمن²، شكرى أحمد عمر¹ وجمال همام عبد العليم همام¹. (1) قسم النبات، كلية العلوم، جامعة أسيوط مصر؛ (2) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، مصر، البريد الإلكتروني: yehyamalek2@yahoo.com أجريت هذه الدراسة خلال موسمي 2001/2000 من مواسم زراعة القمح بهدف دراسة الفطريات الممرضة لحشرات من أوراق الذرة تحت الظروف الطبيعية. وجد أن حشرات من أوراق الذرة تصاب بسبعة أنواع من الفطريات الممرضة للحشرات وهي: *Beauveria bassiana*، *B. alba*، *Conidiobolus coronatus*، *C. obscurus*، *C. thromboides*، *Panadora neoaphids* و *Zoophthora radicans* ووجد أن كلا من *Beauveria bassiana*، *B. alba* و *Zoophthora radicans* كانت سائدة التواجد تلاها النوعين *Pandora neoaphids* و *Conidiobolus obscurus*، في حين أن النوعين *C. coronatus* و *C. thromboides* كانا أقلها تواجداً. تبين أن جنس *Beauveria* كان متواجداً من بداية شهر شباط/فبراير حتى الأسبوع الثالث من شهر آذار/مارس مع أعلى حدوث معدل له خلال منتصف شهر شباط/فبراير. أما جنس *Conidiobolus* فقد تم تسجيله بعد الجنس السابق بثلاثة أسابيع. كان تذبذب هذا الجنس من 22 شباط/فبراير حتى 15 آذار/مارس. و جنس *Zoophthora* فقد لوحظ من 15 شباط/فبراير حتى 15 آذار/مارس مع تواجد أعلى حدوث له في 8 آذار/مارس. أما جنس *Pandora neoaphids* فقد لوحظ تواجده اعتباراً من الأسبوع الثالث من شهر شباط/فبراير حتى الأسبوع الثالث من شهر آذار/مارس مع حدوث أعلى تواجد له في منتصف شهر آذار/مارس.

BC 7

التأثير الحيوي لبعض أنواع الـ *Bacillus* في يرقات خنفساء الخابرة *Trogoderma granarium* Everts. سراب داؤد سليمان، خالدة عبد الله سليمان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: dr_srabalshamaa@yahoo.com هدفت الدراسة الحالية إلى تقدير التأثيرات البيولوجية لثمان سلالات من البكتريا العائدة لجنس *Bacillus* والتي عوملت مع حبوب القمح ضد يرقات خنفساء الخابرة (*Trogoderma granarium* Everts). تعود هذه السلالات إلى خمسة

BC 1

مكافحة الدودة القارضة في حقل نبات السلق باستخدام الفطر *Beauveria bassiana*. عبد الحميد حافظ، قسم وقاية النبات، كلية الزراعة، جامعة حلب، سورية، البريد الإلكتروني: hafez2224@hotmail.com
أجريت تجربة لمكافحة الدودة القارضة (*Lepidoptera: Noctuidae*) *Agrotis* spp. التي تتغذى على أوراق السلق (*Beta vulgaris* L. ssp. *cicla* f. *hortensis* Alef). باستخدام فطر مضاد للحشرات *Beauveria bassiana* في حقل بمدينة حلب، سورية، خلال عام 2004. أظهرت النتائج أن موت يرقات الديدان القارضة بسبب الفطر بدأت بعد 11 يوماً من المعاملة واستمرت لنهاية الموسم، ووصلت نسبة موت اليرقات إلى 80% مقارنة مع الشاهد. إن استخدام الفطر *B. bassiana* وإدخاله في مكافحة المتكاملة طريقة رخيصة الثمن وسهلة المنال وسليمة بيئياً، لأنها لا تسبب تلوثاً للبيئة وغير ضارة وذات استمرارية بتكوينها الأبواغ.

BC 2

التقييم الحقلية لنوعين من الفطريات الممرضة للحشرات (*Beauveria bassiana* و *Verticillium lecanii*) ضد ذبابة الياسمين البيضاء *Aleuroclava jasmine* على الحمضيات. حسين فاضل الربيعي، سميرة عودة خليوي، جواد بلبل حمود ومحمد وليد خضير، وزارة العلوم والتكنولوجيا، مركز أبحاث مكافحة المتكاملة، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: halrubeai@yahoo.com
تم تقييم القدرة الإراضية لنوعين من الفطريات الممرضة للحشرات *Beauveria bassiana* و *Verticillium lecanii* ضد ذبابة الياسمين البيضاء على الحمضيات *Aleuroclava jasmine* وتحت الظروف الحقلية لثلاثة مواقع مختلفة. أشارت نتائج معاملة أشجار الحمضيات إلى أن نسبة تطفل العزلة رقم 5 للفطر *B. bassiana* على البيض أو الحوريات كانت أعلى وبصورة معنوية من عزلة الفطر *V. lecanii* مع وجود اختلافات ما بين المناطق. ووجد أن نسب التطفل لكلا نوعي الفطرين المستخدمة تزداد بصورة معنوية بتقدم الوقت. وعلى العموم كانت نسب التطفل على البيض أدنى معنوية من نسب التطفل على الحوريات. وأشارت النتائج إلى إمكانية التأثير السلبي لارتفاع درجات الحرارة وانخفاض الرطوبة في الحقل على نسبة التطفل.

BC 3

عزل وتحديد فرمونات كابنودس اللوز (*Capnodis carbonaria* Klug) وتحكمها في أعدادها. منار بني مفرج ونعيم شرف، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: n.sharaf@ju.edu.jo
أجريت تجارب مخبرية وأخرى حقلية في الفترة الواقعة ما بين عامي 2003-2005 بهدف عزل وتحديد فرمونات كابنودس اللوز (*Capnodis carbonaria* Klug) (Buprestidae: Coleoptera) ودراسة فاعلية الفرمونات المعزولة على جذب الحشرات البالغة وإمكانية استخدام الفرمونات للتحكم في أعدادها. أظهر التحليل الكيميائي للعينات التي جمعت في شهر نيسان/أبريل عن طريق استخدام جهاز Gas Chromatography Mass Spectrometry (GC-MS)، وجود ثلاثة فرمونات من أصل هيدروكربوني، وهي: هكساكوسان (C26H54) وهيبناكوسان (C27H56) ونوناكوسان (C29H60). استجاب كل من الذكر والأنثى للأخر في المختبر وكانت المسافة الفعالة للفرمونات (Pheromone active zone) تتراوح ما بين 208.5-230.6 سم. تم عزل أجزاء الفرمونات الثلاثة (Pheromone fractions) عن طريق استخدام كروماتوغرافيا جل السيليكا. وبعد إجراء التجارب المخبرية والحقلية عليها باستخدام ثلاثة تراكيز مختلفة كان الجزء المأخوذ من جسم الأنثى FBI هو الأكثر فاعلية في جذب الحشرات البالغة، تلاه الجزء المأخوذ من جسم الذكر MBI ثم الجزء المأخوذ من القناة الهضمية للذكر MGI. كذلك كان التركيز المستخلص من وحدة الجزء المحتوي على المكون الفرمون/ في وحدة المذيب، هو الأكثر فاعلية. تمت مناقشة نتائج عزل وتحديد الفرمونات الثلاثة ومدى فعاليتها في التحكم بأعداد كابنودس اللوز. وحسب ما يتوفر لدينا من معلومات، فإن الفرمونات الثلاثة المذكورة أعلاه هي أول تسجيل لفرمونات الكابنودس.

BC 4

الفطريات الممرضة لحشرات من أوراق الذرة (*Rhopalosiphum maidis* (Fitch.) التي تصيب نباتات القمح بأسبوط، مصر. أحمد يحيى عبد المالك¹، محمد علاء الدين أحمد عبد الرحمن²، شكرى أحمد عمر¹ وجمال همام عبد العظيم همام¹.
(1) قسم النبات، كلية العلوم، جامعة أسبوط، مصر، البريد الإلكتروني: yehyamalek2@yahoo.com؛ (2) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الجيزة، مصر.

أجريت هذه الدراسة خلال موسمي 2000 و 2001 من مواسم زراعة القمح بهدف دراسة الفطريات الممرضة لحشرات من أوراق الذرة تحت الظروف الطبيعية. وجد أن حشرات من أوراق الذرة تصاب بسبعة أنواع من الفطريات الممرضة للحشرات وهي: *Beauveria bassiana*، *B. alba*، *Conidiobolus coronatus*، *C. obscurus*،

المكافحة الحيوية لآفات

المرضين، بينما تشير التجارب إلى إمكانية مقاومة مرضي الذبول الفيوزاريومي وأعفان الجذور المتسبب عن الفطر اريزوكتونيا في نباتات الخيار عند تغطية الأرض بالبولي اثيلين لمدة 8 أسابيع خلال أشهر الصيف.

IPM 20

التوجهات الحديثة في مكافحة أمراض القمح على المستوى العالمي. صلاح الدين خباز، د. لادالكشي وف. فالوفاباريداسان، قسم أمراض النبات، مركز أبحاث وقاية النبات، جامعة تاميل نادو الزراعية، كويمبوتور، الهند، البريد الإلكتروني: salahthalal@rediffmail.com، salah_edk@yahoo.co.uk

يعدّ القمح المحصول الغذائي الأكثر زراعة في العالم، ويحتوي على العديد من البروتينات مقارنة مع محاصيل الحبوب الأخرى، كما يحتوي على نسبة عالية من حمض النيكوتين والثيامين. ويعدّ القمح من المحاصيل الغذائية الرئيسية التي تعاني من العديد من الأمراض من أهمها الصدأ، لفحة السنابل، البياض الدقيقي، التفحم... الخ. تسبب العديد من أمراض القمح إنخفاضاً ملحوظاً في الغلة والنوعية إذا لم تتم عملية المكافحة بصورة صحيحة. ويسبب مرض الصدأ في استراليا إنخفاضاً بالغلة مقداره 84%. وعلى المستوى العالمي تُستعمل 85% من المبيدات الفطرية لمكافحة أمراض القمح أي بما يعادل 1,589 بليون دولار أمريكي. لذلك يجب إتباع برنامج مكافحة متكاملة. ففي كندا، تمت مكافحة مرض البياض الدقيقي باستخدام السيكون الذي تبين أنه يحفز الخلية على تشكيل نتوءات أو إنتاج مركبات فينولية... الخ كآليات دفاع وقائية. ويتم العمل في المركز الدولي للبحوث الزراعية في المناطق الجافة على مسح المخزون الوراثي (الجينات) ضد مرض الصدأ. استطاعت العديد من الدول المتقدمة والمتطورة تحديد مصادر الجينات المقاومة لأهم أمراض الصدأ (Lr₂₁، Lr₃₅، Lr₄₆، Sr₃₉). كما تم استخدام تقانات المكافحة الحيوية لمكافحة مرض العفن الكلي باستخدام بكتيريا (*Pseudomonas fluorescens*) و (*Pseudomonas aureofaciens*). كما بينت الهندسة الوراثية لنبات القمح مقاومته لفيروس التبرقش المخطط على القمح وذلك باستخدام مضادات الفيروسات الحيوانية. وتم تطوير العديد من الوسائل في ألمانيا من أجل الكشف عن أبواغ الفطر وعوامل الطقس التي تساعد على التشخيص الصحيح للمرض والتخطيط المتطور لمكافحته. وجمالياً فإن مكافحة الأمراض يجب أن تتبع كل الطرائق الإقتصادية المتاحة وغير المضرّة بالبيئة للمحافظة على المحصول.

IPM 21

الإدارة المتكاملة للإنتاج ومكافحة الآفات في الزراعات المحمية. خليفة حسين دعباح¹، مصطفى حسين بلاك²، عياد إبراهيم الحاجي² وامحمد محمد الصول². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: dabajhk@yahoo.com (2) مركز البحوث الزراعية، طرابلس، ليبيا.

طبق برنامج إدارة متكامل للإنتاج ومكافحة الآفات في الزراعات المحمية خلال المواسم الزراعية 2004/2003، 2005/2004 و 2006/2005 في المناطق الغربية من ليبيا، وتضمن البرنامج استخدام الطرق التالية: تسميس التربة، وضع شباك مانع للحشرات، الزراعة على أغصية اللدان، تقليم وتربية النباتات، نصب مصائد لاصقة، النظافة، إدخال النحل الطنان، الاهتمام بالمسئ. أظهرت النتائج بأن تطبيق هذا البرنامج كان فعال في مكافحة الآفات الزراعية القاطنة في التربة والمحمولة بالهواء، والتقليل من الاعتماد على استخدام المبيدات بصورة دورية، والتوفير في كميات المياه اللازمة للري، وتحسين النوعية وزيادة الإنتاجية، وبالتالي تفادي مشكلة ظهور سلالات مقاومة، وتجنب مخاطر التلوث بمنتجات المبيدات في المنتج والبيئة.

50 معاملة. تم معاملة جذور الشتلات قبل الزراعة بعناصر مكافحة الحيوية المختلفة أو المبيدات الفطرية. تم استخدام الفطر *Trichoderma harzianum*، وعزلتين من الفطر *Trichoderma viride*، والبكتيريا *Pseudomonas fluorescens* و *Bacillus subtilis* على هيئة معلقات بوجية أو جرثومية، كما استخدم أيضاً المبيدات الفطرية مثل: تشجازول وبلتانول وسيلبيست على معلقات، بمعدل 3 مل/ليتر. كما تم معاملة الشتلات أيضاً بخليط من كل نوع من المبيدات الفطرية مع كل نوع من عوامل مكافحة الحيوية. تم حساب النسبة المئوية للإصابة وشدها، إضافة إلى متوسط طول المجموع الخضري والجذري ومساحة الورقة وعدد القرون والتفرعات والوزن الجاف للنبات بعد ثلاثة أشهر من المعاملة.

IPM 18

التشميس كأداة في برنامج إدارة النيماتودا والأعشاب. الزروق أحمد الدنقلي وتونس ميلود محمد، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: Edongali48@hotmail.com

أجريت دراسة حقلية لإختبار كفاءة الأغذية البلاستيكية الشفافة والسوداء في تعقيم التربة بهدف دراسة إمكانية إدارة مجتمعات النيماتودا (*Meloidogyne javanica*) والأعشاب المتواجدة في حقول الطماطم/البندورة والباذنجان وتأثيرهما في النمو الخضري والإنتاج المحصولي. كانت معاملتا التعقيم بالغطاء الشفاف والأسود متساويين من حيث الكفاءة في خفض أعداد النيماتودا خلال الموسم الأول مقارنة بغير المعامل، ولقد دلت النتائج على الكفاءة العالية للغطاء الأسود مقارنة بالشفاف في الموسم الثاني. كما وجد أن أعداد النيماتودا انخفض بمعدل 66.8-88% للغطاء الشفاف، و81.6-100% للغطاء الأسود مقارنة بغير المعامل. أما فيما يخص أعداد الأعشاب، فإن المعاملتين كانتا بنفس الكفاءة خلال الموسمين، وتراوحت نسبة التأثير من 95-100% مقارنة بالشاهد. كما وجد أن نبات النجيل (*Cynodon dactylon*) أكثر مقاومة للمعاملات الشمسية مقارنة بالأعشاب الحولية مثل الخبيز (*Malva sp.*)، العفينة (*Chenopodium album*)، عرف الديك (*Amaranthu sp.*) ونبات *Portulaca sp.* كما دلت النتائج أن نمو النباتات المزروعة (الطماطم/البندورة والباذنجان) وكميات الإنتاج ذات فروق معنوية تحت التشميس المغطى مقارنة بعدم المعاملة. كما انخفضت معدلات التعقد على النباتات المعاملة بالغطاء الشفاف والأسود مقارنة بالشاهد معنويًا. دلت النتائج أن للأغذية كفاءة عالية في ارتفاع درجة حرارة التربة وقد وصلت إلى 20 °س درجة مئوية على عمق 5-10 سم. وكان الغطاء الأسود أكثر كفاءة لرفع درجة حرارة التربة مقارنة بالغطاء الشفاف غير أن الفروقات ليست معنوية.

IPM 19

تأثير التشميس في الأرض المغطاة وغير المغطاة في نسبة حدوث مرضي الذبول الفيوزاريومي وعفن الجذور الرايزوكتوني في نباتات الخيار تحت ظروف الصوبة. إيمان صالح فراج¹ ويحيى عمر فتوح². (1) قسم أمراض النبات، كلية الزراعة بقنا، جامعة جنوب الوادي، مصر؛ (2) قسم أمراض النبات، المركز القومي للبحوث، الدقي، جيزة، مصر، البريد الإلكتروني: eman_farrag@yahoo.com

تمت دراسة تأثير التشميس في الأرض المغطاة وغير المغطاة بالبولي إيثيلين في مرض الذبول وعفن جذور الخيار تحت ظروف الصوبة/الدفينة. أوضحت النتائج أن العزلة رقم 2 من الفطر *Fusarium oxysporium* f.sp. *cucumerinum* سجلت نسبة موت في مرحلة ما قبل وبعد الظهور بمقدار 26.4 و 67.7%، على التوالي. وأدت كذلك العزلة رقم 2 من الفطر *Rhizoctonia solani* إلى نسبة موت النباتات بواقع 41.0 و 71.0% في مرحلة ما قبل وما بعد الظهور، على التوالي. تم وضع لقاح الفطر *F.o. f.sp. cucumerinum* و *R. solani* في أكياس قماش دفنت على عمق 10-20 سم في التربة، وتم تغطية نصف التجربة بالبولي إيثيلين والنصف الآخر لم يغط، وتركت الأكياس لمدة 4 أو 6 أو 8 أسابيع، ثم جمعت لدراسة تأثير التشميس في تعداد الفطريات الممرضة وكذلك نسبة حدوث المرضين. أوضحت النتائج فيما يخص الأرض المغطاة بالبولي إيثيلين أن أفضل الفترات كانت 8 أسابيع، وأدت إلى تقليل تعداد الفطرين الممرضين في التربة بواقع 99%، وأدت التغطية لمدة 6 أسابيع إلى انخفاض مقدارة 70.6 و 80.0% بالنسبة للفطرين *F.o. f.sp. cucumerinum* و *R. solani*، على التوالي. أما بالنسبة للأرض غير المغطاة، فكانت أفضل النتائج المتحصل عليها بواسطة الفترة 8 أسابيع حيث أدت إلى تقليل تعداد الفطريات في التربة بواقع 46.5 و 57.6% بالنسبة للفطرين السابقين، على التوالي. بينت النتائج عند تقييم المعاملات تحت ظروف الصوبة/الدفينة أن أعلى انخفاض في حدوث مرضي الذبول الفيوزاريومي وأعفن الجذور المتسبب عن الفطر رايزوكتونيا تم الحصول عليها بعد 8 أسابيع من التغطية، وأدت إلى تقليل المرضين بواقع 88.5 و 95.2% بالنسبة لمرحلة قبل وبعد الظهور، على التوالي، وأدت فترة التغطية لمدة 6 أسابيع إلى انخفاض للمرضين بواقع 72.4 و 87.6% بالنسبة لمرحلة قبل وبعد الظهور، على التوالي. أما بالنسبة للأرض غير المغطاة فكانت أفضل النتائج المتحصل عليها بعد 8 أسابيع وأدت إلى اختزال نسبة حدوث المرضين بواقع 46.2 و 49.1% بالنسبة لمرحلة قبل وبعد الظهور، على التوالي. وأوضح التحليل الاحصائي أن فترة التشميس لمدة 4 أسابيع في الأرض غير المغطاة لم يكن لها تأثير معنوي في انخفاض نسبة حدوث

بالمبيد بلتانول مع *T. harzianum* باستخدام صمغ الزانثان أقل نسبة إصابة بتعفن الجذور وشدها في كلا الفترتين وكذلك أعطت أحسن خصائص خضرية للنبات.

IPM 15

استخدام أنماط مختلفة لمكافحة مرض تعفن جذور الخيار المتسبب عن الفطر *Phytophthora drechsleri*. ياسر عيدان
باني وصالح حسن سمير، قسم وقاية النبات، كلية الزراعة، بغداد العراق، البريد الإلكتروني:
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هدفت الدراسة إلى تقويم أنماط مختلفة في مكافحة مرض تعفن جذور الخيار المتسبب عن الفطر *Phytophthora drechsleri* المعزول من جذور نباتات الخيار المصابة. وحقت نتائج جميع المعاملات فروقا معنوية في خفض شدة الإصابة بالفطر *P. drechsleri* مقارنة بمعاملة الشاهد المصاب. وحقت معاملة البذار باللقاح البكتيري *Pseudomonas fluorescens* (4 x 10⁸ وحدة مكونة للمستعمرة/مل) وإضافته للتربة الملوثة لمترتين مع ماء الري انخفاضاً حاداً في شدة الإصابة بالفطر الممرض التي بلغت 6.9%. تلتها في الأهمية معاملة إضافة عنصر النحاس، ومعاملة إضافة فطر مكافحة الحيوية *Trichoderma harzianum* مع الريدميل إلى التربة الملوثة بالفطر الممرض، حيث بلغت شدة الإصابة 9.7 و 12.4%، على التوالي. كما أنت هذه المعاملات إلى زيادة معنوية في الوزن الجاف للمجموع الجذري والخضري وطول النبات. تفوقت معاملة إضافة عنصر النحاس إلى التربة على المعاملة التي استخدم فيها المبيد نفسه رشاً على النبات في خفض شدة الإصابة بالفطر الممرض، وبلغت 9.7 و 13.9%، على التوالي. كما أبدت المبيدات الكيماوية مثل الريدميل، والبلتانول، والتشيجازول فاعلية في مكافحة المسبب المرض، وتفوق المبيد بلتانول في خفض شدة الإصابة بالفطر الممرض، وبلغت 23.6%.

IPM 16

تقييم طريقتي مكافحة المتكاملة والتطعيم لمكافحة مرض الذبول الفيوزاريومي ونيماتودا تعقد الجذور على القرعيات في الأردن. محمد القاسم¹، زكريا مسلم²، زياد ناصر¹ ودرويش مصطفى¹. (1) المركز الوطني للبحوث الزراعية ونقل التكنولوجيا، ص.ب. 639، البقعة 19381، الأردن، البريد الإلكتروني: mohdqasim@ncartt.com؛ (2) مختبر الحجر الزراعي مديرية الوقاية النباتية، وزارة الزراعة، عمان، الأردن.

تم تقييم كفاءة برنامج مكافحة متكاملة في مكافحة مرض الذبول الفيوزاريومي ونيماتودا تعقد الجذور (*Meloidogyne spp.*) على الخيار بمنطقة جرش (شمال الأردن) والبطيخ بمنطقة القويرة (جنوب الأردن). شمل برنامج مكافحة المتكاملة تدخين التربة حيويًا بمعدل 7 و 10 كغ روث بقر طازج/م² تربة لمدة 21 يوماً ثم إضافة فطري مكافحة الحيوية *Trichoderma* و *Paecilomyces* أو إضافة بعض الكيماويات الزراعية، أو بدون أية إضافات للمقارنة. وفي اختبار ثالث بمنطقة القويرة تم تقييم طريقة تطعيم شتلات البطيخ صنف (رأس العبد) على الأصل (نتسوكوبوتو) المقاوم للإصابة بالذبول الفيوزاري في مكافحة مرض الذبول الفيوزاريومي على البطيخ المتسبب عن الفطر *Fusarium*. تفوقت معاملات التدخين الحيوي مع إضافة فطريات مكافحة الحيوية إلى التربة في خفض ($P \leq 0.05$) أعداد الوحدات التكاثرية لفطر *Fusarium* في تربة محصول الخيار بنسبة 42-60.5% مقارنة بالشاهد. كما خفضت ($P \leq 0.05$) هذه المعاملات أعداد الطور الثاني لنيماتودا تعقد الجذور في التربة وكذلك دليل تعقد الجذور في نهاية الموسم. بينما أدت معاملات التدخين الحيوي واستخدام الكيماويات الزراعية في محصول البطيخ بالقويرية في خفض ($P \leq 0.05$) إصابة البطيخ وكذلك خفض أعداد الوحدات التكاثرية لفطر *Fusarium* في التربة بنسبة 44.3-47.6% مقارنة بالشاهد. وأدى استخدام طريقة تطعيم أشتال النضيق (صنف رأس العبد) على الأصل (نتسوكوبوتو) إلى خفض إصابة البطيخ وكذلك خفض أعداد فطر الفيوزاريوم في التربة بنسبة 64.7% مقارنة بالشاهد. كما أدت هذه المعاملة إلى زيادة الإنتاج بنسبة 60% عن باقي المعاملات.

IPM 17

استخدام الشتيل بوصفه طريقة لمكافحة مرض تعفن جذور السمسم مع طرائق مكافحة الأخرى تحت ظروف البيت الزجاجي. نجوى بشير الشبي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني:
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اجريت هذه التجربة لتحديد كفاءة استخدام الشتل كطريقة لمكافحة مرض تعفن جذور السمسم. زرعت بذور السمسم (صنف محلي) في أحواض بلاستيكية مملوءة بمزيج من التربة والبتمس بنسبة 1:2 معقمة بالمؤسدة/أوتوكلاف. تم اختيار الشتلات السليمة بعمر شهر واحد، ولوثت تربة السنادين/الأصص بخليط الفطريات (*Macrophomina phaseolina* و *Fusarium solani* و *Pythium aphanidermatum*) وبواقع طبق/فطر/سندانة أو أصيص، واشتمل المكرر الواحد على

Diplodia phoenicum) وتعفن النورات الزهرية (*Mauginiella scaetiae*). أظهرت هذه الدراسة أن هناك العديد من العوامل التي ساعدت على انتشار هذه الأمراض في دول الخليج العربي منها سهولة انتقال منتجات النخيل ما بين هذه الدول وتوفر الظروف المناخية والزراعية الملائمة على تطور الإصابة. كما أظهرت الدراسة أن الإدارة المتكاملة لأمراض النخيل من أكثر الطرق فاعلية في المكافحة، وتتمثل في تطبيق إجراءات الحجر الزراعي باعتباره خط الدفاع الأول، المقاومة البايولوجية، زراعة النخيل الناتج من زراعة الأنسجة، استخدام المستخلصات النباتية، زراعة أصناف النخيل المقاومة للأمراض، العناية بنظافة النخلة، تغطية العذوق، تجنب الزراعة البينية، العمليات الزراعية الجيدة مثل التسميد والري والحصاد والخرن. لذلك يستوجب استخدام إستراتيجية الإدارة المتكاملة لأمراض النخيل للإقلال من استعمال المبيدات الفطرية الكيماوية والمحافظة على البيئة من خطر التلوث، إضافة إلى أنها ذات مردود اقتصادي للمزارعين.

IPM 12

المكافحة المتكاملة للفطر *Rhizoctonia solani* على البندورة/الطماطم. محمد صادق حسن¹، أسامة قاسم العبيدي² وأحمد كاظم عبد الهادي². (1) قسم وقاية النبات، كلية الزراعة، جامعة بغداد، بغداد، العراق؛ (2) الكلية التقنية، المسيب، العراق، البريد الإلكتروني: Mohamad2004S@yahoo.com

نفذت المكافحة المتكاملة للفطر *Rhizoctonia solani* في مختبرات وحقول الكلية التقنية، المسيب. وكان المبيدان بنليت وبلتانول مثبتين قويين للنمو الشعاعي للفطر *R. solani* وفطر المكافحة الأحيائية *Trichoderma harzianum* (100%) عند استخدامهما بالمعدلات 0.5، 1.0 و 1.5 غ/لتر وفقاً لنتائج الدراسة المخبرية. وبلغت نسبة تثبيط نمو الفطر الممرض 62.78% عند استخدام المبيد تشيغازول و 36.90% إزاء الفطر الأحيائي. وأحدثت معاملة التربة بالمبيد تشيغازول والفطر الأحيائي أقل نسب موت للبائدرات قبل البزوغ (10.0%) وبعده (2.9%)، وشدة إصابة 5.69%، بينما إزداد وزن المجموع الجذري (0.71 غ/نبات) والمجموع الخضري (3.70 غ/نبات). ولم تسجل فروقات معنوية ما بين قيم هذه المعاملة وقيم معاملة بذور البندورة/الطماطم بالمبيد، والتربة بالفطر الأحيائي، بينما كانت هذه الفروقات معنوية مقارنة بمعاملات الشاهد.

IPM 13

استعمال المخلفات العضوية في مكافحة الفطر *Fusarium solani*. محمد صادق حسن¹، أحمد كاظم عبد الهادي² وأسامة قاسم العبيدي². (1) قسم وقاية النبات، كلية الزراعة، جامعة بغداد، بغداد، العراق؛ (2) الكلية التقنية، المسيب، العراق، البريد الإلكتروني: Mohamad2004S@yahoo.com

حقق الفطر *Triticum harzianum* المعزول من مخلفات الخيل العضوية درجة تضاد قدرها 1.75 حسب سلم Bell. أدت إضافة خليط الفطريات المعزولة من المجاري وخليط الفطريات المعزولة من مخلفات الأبقار، الأغنام، الخيل والدواجن إلى خفض النسبة المئوية لموت البائدرات المتسبب عن الفطر *Fusarium solani* قبل البزوغ وبعده، إذ بلغت 30.13، 25.13، 26.35، 23.43، 24.30%، و 32.00، 25.58، 27.45، 25.83، 26.13%، على التوالي. كما انخفضت شدة الإصابة بالمرض، إذ بلغت 43.16، 33.52، 81.20، 32.40 و 32.50%، على التوالي، في حين كانت في معاملة الشاهد قبل البزوغ وبعده 54.8 و 56.9%، على التوالي.

IPM 14

المقاومة المتكاملة لمرض تعفن جذور السمسم في محافظة نينوى جامعة الموصل العراق. علي كريم الطائي¹، نجوى بشير شمعون اللشي² ومحمد بشير اسماعيل². (1) قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: aaltaae@yahoo.co.uk؛ (2) قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق.

درس تأثير تغليف بذور السمسم بعناصر المقاومة الحيوية والكيميائية في نسبة الإصابة بموت البائدرات قبل الظهور وبعده وشدتها في البيت الزجاجي. وأعطت تلك المعاملات المزدوجة انخفاضاً معنوياً في نسبة الإصابة وشدتها مقارنة بالمعاملات المفردة. وقد سببت المعاملة المتضمنة تغليف البذور بالمبيد بلتانول مع المبيد الحيوي *T. harzianum* أقل نسبة إصابة بموت البائدرات قبل الظهور وبعده وشدتها. وفي حالة التغليف بالزانتان أعطى أعلى طول للمجموع الخضري والجذري والمساحة الورقية وعدد القرون والتفرعات والوزن الجاف للنبات. وتم استخدام طريقة أخرى في زراعة السمسم هي الزراعة بالشتل بدلا من الزراعة البذرية، إذ أعطت هذه الطريقة فرصة للبائدرات للهروب من الإصابة المبكرة. وأعطت معاملة الشتلات بصمغ الزانتان انخفاضاً معنوياً في نسبة الإصابة بتعفن الجذور وشدتها مقارنة بالمعاملات التي استخدم فيها الصمغ العربي. وسببت معاملة الشتلات بالمبيد بلتانول مع المبيد الحيوي *T. harzianum* أقل نسبة مئوية للإصابة وشدتها (16.66% و 0.10، على التوالي) مقارنة باستخدام صمغ الزانتان. درس تأثير تغليف البذور بعناصر المقاومة الكيماوية والحيوية في نسبة الإصابة بتعفن الجذور وشدتها بعد 3 و 4 أشهر من الزراعة في الحقل وفي خصائص النبات. وأعطت معاملة تغليف البذور

IPM 9

التكامل بين منظم النمو الحشري Nomolt والمفترسين ذبابة السيرفس (*Metasyrphus corollae* F.) والدعسوقة ذات الأحد عشر نقطة (*Coccinella undecimpunctata* L.) في مكافحة من الفول/الباقلاء الأسود (*Aphis fabae* Scop.). سهل كوكب الجميل وجهينة أدريس محمد علي، قسم وقاية النبات، كلية الزراعة والغابات جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com

تم دراسة الكفاءة الافتراضية للمفترسين ذبابة السيرفس (*Syrphidae: Diptera*) *Metasyrphus corollae* F. والدعسوقة ذات الأحد عشر نقطة (*Coccinellidae: Coleoptera*) *Coccinella undecimpunctata* L. وتكاملها مع منظم النمو الحشري نومولت وفي التأثير المشترك على الحوريات والبالغات لمن الفول/الباقلاء الأسود (*Aphis fabae* Scop.) (*Aphididae: Homoptera*). أوضحت النتائج أن يرقات المفترس ذبابة السيرفس استهلكت 137.35 و 116.26 حورية وبالغة، على التوالي خلال طورها البرقي عندما تغذت على كل منهما بصورة منفصلة. واستهلكت يرقات الدعسوقة ذات الأحد عشر نقطة 195.15 و 166.16 حورية وبالغة، على التوالي خلال الفترة نفسها وبصورة منفصلة أيضاً. وقد أشارت النتائج إلى أن استخدام منظم النمو الحشري نومولت بتركيز 0.5 سم/لتر بمفرده حقق أعلى نسبة قتل لحشرة من الفول/الباقلاء الأسود وبلغت 88.30% عند كثافة الفريسة 40 حورية/نبات. أما التأثير المشترك للمفترسين بكثافتيهما مع منظم النمو الحشري، فقد بينت النتائج التأثير المعنوي للتداخل بين كثافة الفريسة ومنظم النمو الحشري وكثافة المفترسين في النسبة المئوية لموت الفريسة. وحقق منظم النمو الحشري نومولت نسبة موت 100% لفريسة من الفول/الباقلاء الأسود بكثافتيهما 20 و 40 حورية/نبات وبالتكامل مع استعمال يرقة واحدة وتارة ويرقتين تارة أخرى من المفترسين أنفي الذكر باستثناء نسبة الموت لكثافة الفريسة 40 حورية/نبات باستعمال منظم النمو الحشري نومولت مع يرقة واحدة من المفترس ذبابة السيرفس والتي بلغت نسبة الموت عندها 77.7%.

IPM 10

تطوير وتحسين المكافحة المتكاملة على نوعين من أشجار الحمضيات في ناحية سيدي سليمان غرب شمال المغرب. مولاي الشريف اسماعيلي¹، م. أفلاح¹، ت. بيهي²، ج. ودجيني³، م. سباعي¹ وم. الزمزمي². (1) مختبر الحشرات، البحث الزراعي، القنيطرة، ص.ب. 293، المغرب، البريد الإلكتروني: csmaili@yahoo.fr؛ (2) الأملاك الفلاحية، UCP، سلا، المغرب؛ (3) المفتشية الجهوية لوقاية النباتات، ص.ب. 148، القنيطرة، المغرب.

أجريت هذه الدراسة من أجل تقييم ومقارنة فاعلية المكافحة المتكاملة ضد أهم الحشرات على نوعين من أشجار الحمضيات (*Navel* و *Maroc Late*) في ناحية سيدي سليمان، غرب شمال المغرب وذلك خلال أربع سنوات (من 2002 إلى 2005). وتم إيجاد نظرية جديدة للمكافحة المتكاملة في هذا الإطار، وتم تطبيقها وتطويرها على نطاق واسع عند منتجي الحمضيات في هذه المنطقة. استعملت التقنيات والآف من الطفيليات من صنف *Aphytis melinus* تم إطلاقها لمكافحة القمل من نوع *Aonidiella aurantii* و *Parlatoria pergandii*، وبينت النتائج أن الحشرات القشرية ومنها *Lepidosaphes beckii*، *Parlatoria ziziphi*، *Aonidiella aurantii* و *Parlatoria pergandii*، وذبابة البحر الأبيض المتوسط *Ceratitis capitata* والحلزون من المشاكل الرئيسية لأشجار الحمضيات في هذه المنطقة. وتم استبعاد استعمال المواد الكيماوية لمكافحة الحشرات الأخرى. وتمت مكافحة ذبابة البحر المتوسط دون استعمال المواد الكيماوية (*Maroc Late*) أو باستعمال القليل من الرش المركز (*Navel*). وقد تم مناقشة النتائج في إطار المكافحة المتكاملة خلال الفترة المذكورة. وكانت نسبة إصابة الفواكة في مرحلة الجني مقبولة جداً (أقل من 2%) بالنسبة لذبابة ذبابة البحر الأبيض المتوسط وكذلك أقل من 1% بالنسبة للحشرات القشرية). وتم وضع استراتيجية وبرنامج مناسبين للمكافحة المتكاملة بغرض إدارة مكافحة أهم آفات أشجار الحمضيات في هذه المنطقة. ويمكن تطبيق هذه المكافحة المتكاملة الجديدة للقضاء على ذبابة البحر الأبيض المتوسط بالتوازي مع تقنية إطلاق الحشرات العقيمة.

IPM 11

الإدارة المتكاملة لأمراض النخيل في دول الخليج العربي. عماد حسين الطريحي، وزارة الشؤون البلدية والزراعة، إدارة التنمية الزراعية، ص.ب. 1966، الدوحة، قطر، البريد الإلكتروني: al_turaihi@yahoo.com

تعتبر نخلة التمر (*Phoenix dactylifera* L.) من أهم أشجار الفاكهة في كافة دول الخليج العربي، كما تزرع أيضاً كشجرة زينة في العديد من الحدائق العامة والشوارع. تصاب نخلة التمر بالعديد من الأمراض الفطرية في كافة أطوار نموها من البادرة حتى الأطوار المتأخرة من عمرها. ويمكن أن تصيب هذه الأمراض أجزاء النخلة المختلفة مثل الثمار والسعف والجذع. ومن الأمراض الفطرية المهمة التي تصيب نخلة التمر في دول الخليج العربي: مرض تعفن القمة النامية (*Thielaviopsis paradoxa*)، اللفحة السوداء (*T. paradoxa*)، التفحم الكاذب (*Graphiola phoenicis*) تبقع الأوراق (*Alternaria spp.*، *Cladosporium spp.*، *Helminthosporium spp.* وغيرها)، تعفن قاعدة السعف

IPM 6

اتجاهات حديثة لمكافحة ديدان اللوز. عبد العزيز أبو العلا خضر، معهد بحوث وقاية النباتات، الدقي، الجيزة، مصر، البريد الإلكتروني: prof.abdelaziz.abouelela@gmail.com

يحتل القطن المصري المرتبة الأولى من بين المحاصيل الإقتصادية في مصر والعالم. وتعتبر ديدان اللوز القرنفلية والشوكية أهم الآفات الحشرية التي تهاجم نباتات القطن حيث تصيب الأجزاء الثمرية وهي البراعم (الوسواس) والأزهار واللوز/الجوز الأخضر كما تؤثر تأثيراً مباشراً في إنتاجية محصول القطن كما ونوعاً. وتهدف هذه الدراسة إلى إيجاد حلول لمشاكل ديدان اللوز وتتعلق هذه الدراسة بمكافحة ديدان اللوز باستخدام فرمونات الجاذبات الجنسية لعدة أغراض أهمها حماية البيئة من التلوث، خفض معدلات استخدام المبيدات الحشرية، تأخير إنتخاب سلالات مقاومة من الآفة لفعل المبيدات وكذلك المحافظة على الأعداء الطبيعية. وتشمل طرق استخدام الفرمونات: (1) مصائد الفرمونات الجنسية جنباً إلى جنب مع عمليات فحص اللوز/الجوز الأخضر لتقدير نسب الإصابة بديدان اللوز بهدف تحديد أوقات مكافحة. هذه الآفات وقد ساعد استخدام المصائد الفرمونية في خفض معدلات الإصابة بديدان اللوز من 7% إلى أقل من 2%؛ (2) تكثيف مصائد الفرمونات لاصطياد أكبر عدد من ذكور الفراشات لعمل خلل في النسبة الجنسية وتفيد هذه الوسيلة عند التعداد المنخفض من الآفة؛ (3) استخدام الجاذب القاتل ويتكون من جرعة صغيرة من الفرمون مخلوط مع مبيد بايرثرونيدي وفيها يتم جذب ذكور الفراشات إلى المخلوط بواسطة الفرمون مع قتلها عند ملامستها للمبيد وأظهرت هذه الوسيلة فاعلية عالية وخفض معنوي في الإصابة بديدان اللوز ومعدل استخدام المبيدات مقارنة باستخدام المبيدات الحشرية منفردة.

IPM 7

تأثير بعض عناصر الإدارة المتكاملة لمكافحة الآفات ضد دودة اللوز القرنفلية. عبد العزيز أبو العلا خضر¹، إبراهيم حسن النمكي¹، أحمد إسماعيل جاد الله² وشليبي محمد العوضي². (1) معهد بحوث وقاية النباتات، الدقي، الجيزة، مصر؛ (2) كلية الزراعة، جامعة الأزهر، القاهرة، مصر، البريد الإلكتروني: prof.abdelaziz.abouelela@gmail.com

تعتبر دودة اللوز القرنفلية من أهم الآفات الحشرية التي تصيب نباتات القطن إذا تؤثر تأثيراً مباشراً في إنتاجية محصول القطن. وينشأ عن التوسع في استخدام المبيدات الحشرية وحدها عدة مشاكل أهمها: التلوث البيئي، سرعة إنتخاب سلالات مقاومة من الآفة لفعل المبيدات، القضاء على الأعداء الطبيعية. ويهدف البحث إلى تقييم بعض عناصر مكافحة المتكاملة ضد الآفة ومنها: استخدام الجاذبات الجنسية المعروفة باستخدام الفرمونات في مكافحة دودة اللوز القرنفلية عن طريق معاملة النباتات بمستحضر الفرمونات بهدف تضليل ذكور الفراشات وبذلك تقل عملية التزاوج بين الفراشات عند إفراز الفرمون الجنسي الخاص بها فتضع الإناث بيضاً غير مخصب. وقد أدى تطبيق الفرمونات الجنسية بالتكامل مع المبيدات إلى خفض معدلات الإصابة بديدان اللوز مقارنة باستخدام المبيدات الحشرية الموصى بها منفردة بمعدل بلغ 37% تقريباً. تلعب الأعداء الحيوية دوراً هاماً في مكافحة الآفات وقد لوحظ أن تعداد المفترسات في حقول القطن المعاملة بالفرمونات الجنسية تعادل تقريباً ضعف تعدادها في المناطق المعاملة بالمبيدات. ونظراً لأن النشاط الإنزيمي له دور حيوي في مستويات مقاومة الآفة لفعل المبيدات كنتيجة للتوسع في استخدام المبيدات وحدها كأسلوب مكافحة. فقد وجد أن النشاط الإنزيمي لكل من الفوسفاتيز القاعدي والحمضي، أستيل كولين استيريز، الأستيريزات الأليفاتية والأستيريزات غير متخصصة في يرقات دودة اللوز القرنفلية التي جمعت من الحقول المعاملة بالمبيدات منفردة أعلى بكثير عنها في اليرقات التي جمعت من الحقول المعاملة بالفرمونات. معدلات الإصابة بدودة اللوز القرنفلية وكذلك المعاملة بالمبيدات في الزراعات المتأخرة أعلى منها في الزراعات المبكرة.

IPM 8

استعمال تقنيتي العقم الوراثي والمصائد المكثفة في مكافحة دودة التمر (*Ectomyelois ceratoniae*) في حقل الرمان. جودة المديني، مخبر حماية النباتات، المعهد الوطني للبحوث الزراعية بتونس، 49 شارع الهادي الكراي، 2049 أريانة، تونس، البريد الإلكتروني: joudamediouni@lycos.com

تعد دودة التمر (*Ectomyelois ceratoniae*) (Lepidoptera: Pyralidae) من أخطر الآفات الحشرية في تونس وفي مناطق حوض البحر الأبيض المتوسط و الشرق الأدنى. تتغذى هذه الحشرة على العديد من العوائل النباتية وتلحق بها أضراراً جسيمة في الحقل أو أثناء الخزن. بينت الأبحاث مدى الانسجام والتكامل بين هاتين التقنيتين و مدى فاعليتهما في خفض المجتمعات الطبيعية للحشرة. أثبتت عملية التقييم المنفذة عند جني الثمار أن نسبة إصابة الغلال بالحشرة في الحقل المعالج كانت ضعيفة بالمقارنة مع الحقل الشاهد، إذ كانت نسبة إصابة الغلال في الحقل المعالج تقدر بنحو 1.25%، في حين بلغت 25% في الحقل الشاهد بعد 3 سنوات من النثر المتواصل للحشرات العقيمة واستعمال المصائد المكثفة.

دون انتشارها، وذلك بناء على توصيات الخبراء المختصين وطلب البلدان المعنية. وساعد ذلك في اكتشاف الآفة في عدد من البلدان وفي دعم البرامج المحلية للسيطرة عليها والحيلولة دون انتقالها إلى مناطق جديدة. وتسعى المنظمة إلى إقرار مرحلة جديدة لهذا المشروع أكثر أهمية، يتضمن تدريبات حقلية (على المستويين الإقليمي والوطني) وتوفير الخبرة الدولية والتجهيزات اللازمة لمراقبة الآفة والسيطرة عليها. وتلقي هذه الورقة الضوء على الوضع الحالي للآفة والإجراءات المتبعة للسيطرة عليها أو للوقاية منها.

IPM 4

التكامل بين مثبط النمو الحشري تريكارد والدعسوقة ذات السبع نقاط في مكافحة من الفول/الباقلاء الأسود. نزار مصطفى الملاح وجهينة ادريس محمد علي، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: e_madk@maktoob.com

أظهرت نتائج دراسة تأثير التكامل بين تراكيز مختلفة من التريكارد (0.5، 3 و 1.5%) وطريقة المعاملة (معاملة الورقة النباتية، معاملة الورقة النباتية والمن، معاملة الورقة النباتية والمن وذكور وإناث الدعاسيق) في نسبة القتل والكفاءة الإفتراضية للدعسوقة إن للتريكارد تأثير قاتل في حشرة من الفول/الباقلاء الأسود. ازدادت نسبة القتل مع زيادة التركيز إذ بلغ متوسط نسبة القتل 84.2% عند التركيز 0.55% بعد 24 ساعة من المعاملة. كما أظهرت الدراسة أن ذكور الدعسوقة أكثر حساسية للتريكارد من الإناث. وبلغ أعلى متوسط للكفاءة الإفتراضية لذكور وإناث الدعسوقة عند معاملة الورقة النباتية فقط بالتريكارد 52.6 و 53.1%، على التوالي. أما متوسط نسبة القتل لذكور وإناث الدعسوقة فبلغ بعد خمسة أيام من المعاملة 47.1 و 39.1% عند معاملة الورقة النباتية والمن والدعاسيق بالتريكارد معاً.

IPM 5

الطرق التقليدية في الإدارة المتكاملة إستراتيجية واحدة في خفض تعداد فراشة ثمار البن *Prophantis smaragdina* (Butler) في الحقل. حسن سليمان مهدي¹، أمين الحكيمي²، محمد مهيب³، احمد سيف³، سعيد الشرجبي⁴، وفريدريك بولا⁵. (1) قسم وقاية النبات، كلية الزراعة، جامعة صنعاء، ص.ب. 14430، صنعاء، اليمن، البريد الإلكتروني: hsamahdi@yahoo.com (2) مركز الأصول الوراثية، كلية الزراعة، جامعة صنعاء؛ (3) الإدارة العامة لوقاية النبات، وزارة الزراعة والري؛ (4) قسم التصنيف والتصنيع، إدارة البن، وزارة الزراعة والري؛ (5) السفارة الفرنسية (المعونة الغذائية الفرنسية، منظمة اديال الفرنسية).

يمثل البن (*Coffea arabica*) أحد خمسة منتجات وطنية ذات أهمية إستراتيجية في اليمن، ويعاني من عدة مشاكل أهمها الأضرار التي تسببها يرقات فراشة ثمار البن (خارز البن) (*Thliptocera* (= *Prophantis smaragdina* (Butler) (*Pyralidae*: *Lepidoptera*) *octoguttalis*) بثمار البن سنوياً وتأثيرها المباشر في الإنتاج كما ونوعاً. تسبب هذه الحشرة فقداً في الحاصل يصل في بعض المواسم الزراعية إلى 50%. ولغرض تحسين الحالة البيئية والإنتاجية لمحصول البن استُخدمت بعض الطرق التقليدية كإفراغ الأثاب *Ficus salicifolius* Vahl التي توضع على أشجار البن والتدخين بفضلات الأبقار الجافة في الليالي القمرية بعد الغروب وهي ليلة 13، 14 و 15 من كل شهر هجري إضافة إلى تنظيف الحقل من الثمار المصابة من الموسم السابق وكذلك منها ومن الأوراق في أثناء الموسم وذلك لمكافحة فراشة ثمار البن في كل من مدينة الشرق في محافظة ذمار ووادي يهر بمحافظة لحج. أوضحت النتائج خلال الموسم الزراعي 2004 بمدينة الشرق ووادي يهر، أن كل من معاملة أفرع الأثاب تليها معاملة التدخين أدت إلى انخفاض ملحوظ في الكثافة العددية ليرقات خارز البن مقارنة بالكثافة العددية في الشاهد، ومن ناحية النسبة المئوية للثمار المصابة فقد انخفضت هذه النسبة في معاملة أفرع الأثاب (3.29% و 6% لكل من مدينة الشرق ووادي يهر، على التوالي) مقارنة بالمعاملات الأخرى سواء معاملة التدخين (4.64% و 13% للمنطقتين على التوالي) أو معاملة تنظيف الحقل (4.79% و 12.21% للمنطقتين، على التوالي). أما في الموسم الزراعي 2005 فقد لوحظ أيضاً أن جميع المعاملات سواء في مدينة الشرق أو في وادي يهر قد أدت إلى انخفاض الكثافة العددية ليرقات خارز البن مقارنة بالكثافة العددية في الشاهد، ومع ذلك فإن معاملة أفرع الأثاب مع التدخين وتنظيف الحقل ظلت فيها الكثافة العددية ليرقات خارز البن متدنية حتى نهاية الموسم، مقارنة بمثلاتها في الشاهد. أما من ناحية النسبة المئوية للثمار المصابة يلاحظ وجود تميز معنوي لمعاملة أفرع الأثاب مع التدخين وتنظيف الحقل (4.71% و 5.79% في مدينة الشرق ووادي يهر، على التوالي) على بقية المعاملات الأخرى سواء معاملة التدخين مع تنظيف الحقل (8.79% و 12.79% للمنطقتين، على التوالي) أو معاملة أفرع الأثاب مع تنظيف الحقل (5.14% و 12.64% للمنطقتين، على التوالي). كما لوحظ أن الكثافة العددية المسجلة في مدينة يهر كانت تفوق مثلاتها في مدينة الشرق خلال الموسمين الزراعيين كل على حده. تم تسجيل المتطفل المحلي (*Eulophidae*: *Hymenoptera*) *Elasmus* sp. على يرقات ثمار البن في مدينة الشرق والذي يعد واحداً من عدة متطفلات محلية تم تسجيلها في دراسات سابقة وكانت نسبة التطفل 11.11%.

IPM 1

البدائل الحقلية في استراتيجية السيطرة على بعض آفات القطن الرئيسية في مصر الوسطى. أحمد عبدة حامد وملاك فرح جرجس، معهد بحوث وقاية النباتات، 7 شارع نادى الصيد، الدقى، الجيزة 12311، مصر، البريد الإلكتروني: aahakaa@yahoo.com

يتعرض القطن للعديد من العوامل التي تؤدي إلى خفض إنتاجه، منها التعرض للإصابات الحشرية ومن أهم هذه الآفات دودة ورق القطن (*Spodoptera littoralis*)، دودة اللوز القرنفلية (*Pectinophora gossypiella*) ودودة اللوز الشوكية (*Earias insulana*). تهدف الدراسة الحالية إلى إيجاد وسائل بديلة متكاملة يظهر فيها دعم دور الأعداء الحيوية الطبيعية، الطرق الزراعية، مكافحة السلوكية، استخدام المركبات الحيوية المعدلة وراثياً وإطلاق بعض الطفيليات التي تم إكثارها مخبرياً. أجريت الدراسة بمحافظة المنيا في الموسمين الزراعيين 2004 و 2005 في مساحة 150 فدانا مزروعة قطناً صنف "جيزة 80". اختبرت خمسة برامج رئيسية مقارنة مع الطريقة التقليدية في استخدام المبيدات: (1) برنامج للتنبؤ المسبق بمواعيد حدوث الأجيال للآفات باستخدام المصائد الفرمونية، (2) استخدام المبيدات الحيوية المعدلة وراثياً (الاجرين والاسبينوساد)، (3) استخدام منظمات النمو (مانعات الإنسلاخ: كونسلت، كاسكيد)، (4) منظمات النمو (ميميك) -منظمات النمو النباتي ومسقطات الأوراق (بيكس، السيتوكين)، (5) إطلاق بعض الطفيليات المعروفة بكفاءتها التطفلية على ديدان اللوز القرنفلية والشوكية (التريكوجراما). قيمت كفاءة تلك البرامج بتقدير النسبة المئوية للإصابة بالحشرات الثاقبة الماصة، تعداد لطم دودة ورق القطن، نسب الإصابة بديدان اللوز الشوكية والقرنفلية وكذلك تعداد المفترسات في تلك الحقول. أظهرت النتائج أن الاجرين، طفيل التريكوجرام، الكاسكيد، الكونسلت، الميميك، الاسبينوساد والاستخدام التقليدي للمبيدات الحشرية، قد خفضت نسبة الإصابة بالآفات الحشرية الثلاث بنسبة 34-75%، 22.1%، 37.7-75.3%، 33.9-71.4%، 38.8-74.5%، 67-77.1% و 63.4%، على التوالي.

IPM 2

برنامج مكافحة متكامل لمكافحة كابنودس اللوز (*Capnodis carbonaria* Klug) وكابنودس الدراق (*C. tenebrionis* L.) في محافظة إربد. نعيم شرف ولارا جبر، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: n.sharaf@ju.edu.jo

تم إجراء ثلاثة تجارب حقلية في منطقة علعال (إربد، الأردن) في الفترة الواقعة ما بين 2003/11/11 ولغاية 2004/7/21، بهدف اختبار عدة طرق لمكافحة كابنودس اللوز (*Capnodis carbonaria* Klug) وكابنودس الدراق (*C. tenebrionis* L.) ولوضع برنامج مكافحة متكامل لهاتين الآفتين على أشجار اللوزيات. دلت النتائج المبينة على إنتاجية المحصول وحساب نسبة القتل على احتلال مبيد الكونفدور المرتبة الأولى تلاه الميزورول، وأخيراً الجوازثيون، حيث كانت الزيادة في معدل الإنتاج للمبيدات الثلاثة 67.38، 63.29 و 57.93%، على التوالي. كما تم أيضاً حساب الحد الإقتصادي لكلتا الآفتين والذي قدر بحشرة كاملة واحدة/ شجرة. كذلك دلت نتائج إنتاجية المحصول وحساب نسبة الإنخفاض في تعداد الحشرة على احتلال التسميد العضوي المركز الأول بزيادته لمعدل الإنتاج بنسبة 67.44%. أما بالنسبة للتقليم والجمع اليدوي للحشرات الكاملة، فقد احتل المركزين الثاني والثالث بزيادتهما لمعدل الإنتاج بما يعادل 64.93 و 63.97%، على التوالي. وفي ضوء النتائج السابقة، تم جمع عمليات المكافحة التي تم اختبارها في التجربتين السابقتين في تجربة حقلية ثالثة بهدف وضع برنامج مكافحة متكامل لأفتي كابنودس اللوز وكابنودس الدراق على أشجار اللوزيات. وبناء عليه، تم مناقشة النتائج واقتراح عدد من التوصيات الممكن اتباعها في مكافحة هاتين الآفتين.

IPM 3

جهود منظمة الأمم المتحدة للأغذية والزراعة (FAO) في السيطرة على ذبابة الخوخ (*Bactrocera zonata*) في منطقتي الشرق الأوسط وشمال أفريقيا. خالد علي الرويشدي، خبير وقاية النباتات، مكتب "الفاو" الإقليمي الفرعي لشمال أفريقيا، ص.ب. 300، حي المهرجان، تونس البلندير 1082، البريد الإلكتروني: Khaled.Alrouechdi@fao.org

تعتبر ذبابة الخوخ من الآفات شديدة الخطورة، حيث تهاجم عدداً كبيراً من أشجار الفاكهة مثل الحمضيات، المنغاف، الجوافة، اللوزيات، البايابا، التين، والنخيل، وتهاجم أيضاً عوائل ثنوية من الخضروات مثل البنندورة/الطماطم والخيار وغيرها الكثير. ويمكن أن تلحق أضرارها كامل المحصول إذا لم تتم معالجتها. وفي منطقة الشرق الأدنى، تتمركز الإصابة في الوقت الحاضر خاصة في مصر، مع الإشارة إلى وجودها في بلدان أخرى مثل اليمن، إيران، السعودية وعمان وكذلك قطاع غزة والإمارات العربية المتحدة. وإذا ما انتشرت في البلدان القريبة والخالية منها حتى الآن في حوض البحر الأبيض المتوسط، فسوف تسبب أضراراً جسيمة على الإنتاج المحلي للثمار وسوق تصديرها، تقدر بملايين الدولارات سنوياً، بسبب قيمة الخسارة في المحصول، نفقات المكافحة، إجراءات الحجر الزراعي، إضافة إلى التأثيرات الاجتماعية والبيئية. ويقصد مواجهة هذه المشكلة الخطرة في منطقة الشرق الأدنى، أقرت منظمة "الفاو" مشروعاً إقليمياً لمواجهة الوضع الحالي لذبابة الخوخ والحيلولة

المكافحة المتكاملة للآفات

R 31

تقييم أصناف الذرة الصفراء للإصابة بحفار ساق الذرة. محمد العلان¹، عادل المنوفي¹ وماجدة رويللي². (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص. ب. 113، دمشق، سورية، البريد الإلكتروني: adel-agro@mail.sy، allan@shuf.com؛ (2) مركز البحوث العلمية الزراعية في دير الزور، دير الزور، سورية. أجريت هذه الدراسة في مركز البحوث العلمية في دير الزور - محطة المربعية لتقييم بعض أصناف الذرة المنتجة محليا في الهيئة العامة للبحوث العلمية الزراعية. أظهرت التجارب أن الصنف باسل 2 أكثر قابلية للإصابة بحفار ساق الذرة *Sesamia cretica* بين الأصناف المدروسة، يليه في الأهمية الصنف باسل 1 ثم الصنفين غوطة 1 و غوطة 82، وبينت النتائج ازدياد النسبة المئوية للنباتات المصابة بشكل معنوي بعمر 56 يوماً للنبات مقارنة بعمر 39 يوماً، ثم استقرت نسبة النباتات المصابة حتى جني المحصول تقريبا.

الواعدة تحت الظروف الحقلية ذاتها في الموسم التالي، ولكن بأربعة مكررات. اعتمد التقييم لأجل المقاومة على مستوى ضرر العقد الجذرية. أخذت عينة عشوائية تتألف من خمسة نباتات مع جذورها والتربة الحاوية على الجذور من كل مدخل وغمرت في الماء لمدة يوم واحد ثم غسلت الجذور بعد ذلك. تم حساب العدد الكلي للعقد الجذرية وعدد العقد المتضررة، أظهرت النتائج تبايناً كبيراً في نسبة العقد المتضررة بين المدخلات، حيث تراوحت من 0% في المدخل رقم ILWL-183، السوري الأصل، إلى 84% عند المدخل رقم ILWL-313، التركي الأصل. تم اختيار ثمانية مدخلات (ILWL110، 136، 166، 203، 207، 245، 254 و 258) بنسبة ضرر للعقد الجذرية 10% أو أقل، وستستعمل هذه المدخلات كمصادر مقاومة لتطوير أصناف عدس مقاومة لسوسة العدس.

R 29

مصادر المقاومة لذبابة هس (*Mayetiola destructor*, Say) في سورية. مصطفى البوحسيني، فوزي ربحاوي، ميلودي نشيط، جان فالكون وعثمان عبد الله، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: F.rihawi@cgiar.org، M.bohssini@cgiar.org
تعتبر ذبابة هس الآفة الصارة الرئيسية على محصول القمح في شمال أفريقيا، جنوب أوروبا، شمال أميركا، وشمال كازاخستان. ويعتقد أن لهذه الآفة لها الموطن الأصلي للقمح نفسه وهو وسط آسيا، وقد وجد أن ذبابة هس السورية هي الطراز الحيوي الأكثر شراسة في أنحاء العالم. استخدم هذا الطراز الحيوي في إيكاردا لغربلة القمح وأقاربه البرية لتحديد مصادر جديدة للمقاومة. أجريت الغربلة في غرفة تربية عند درجة حرارة 20°س، ورطوبة نسبية 70%، باستخدام مجتمع ذبابة هس المجموعة من منطقة اللاذقية، الساحل السوري. أجريت التجربة باستخدام تصميم القطاعات العشوائية الكاملة وبأربعة مكررات. استخدم الصنفان "Nesma" و "Cando" كشاهدين الأول حساس والثاني مقاوم. تم تقييم 701 صنف ومدخل من القمح وأقاربه البرية (*Aegilops* و *Triticum*). وجد أن 28 مدخلا من *Aegilops* وأربعة أصناف قمح هجينة (Synthetic) أبدت مقاومة للحشرة. إن وجود ظاهرة موت الأطوار الأولى من ذبابة هس يثبت ردة فعل المقاومة، ويظهر أيضاً أن التضاد الحيوي هو آلية المقاومة الرئيسية في هذه المواد. سوف تستخدم مصادر المقاومة هذه في برامج تربية القمح لتطوير أصناف ومصادر وراثية مقاومة لذبابة هس.

R 30

آليات مقاومة بعض أصناف القمح ومدخلات من أقاربه البرية لحشرة السونة *Eurygaster integriceps* Put. لينا علي¹، مصطفى البوحسيني² ومحمد نايف السلتي¹. (1) كلية الزراعة، قسم وقاية النبات، جامعة حلب، حلب، سورية، البريد الإلكتروني: lina7755@hotmail.com؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: M.bohssini@cgiar.org
تعتبر حشرة السونة (*Eurygaster integriceps* Puton) (Hemiptera: Scutelleridae) من الآفات الرئيسية على القمح في وسط وغرب آسيا، تم تحديد مصادر وراثية من القمح وأقاربه البرية مقاومة لحشرة السونة في الطور الخضري. أجريت الدراسة لتحديد آليات المقاومة لحشرة السونة في هذه الأصناف/المدخلات. تم إجراء اختبارين للتفضيل، أحدهما يتألف من الأصناف/المدخلات المقاومة من القمح الطري، القمح القاسي و *Aegilops*. إلى جانب أصناف/مدخلات حساسة من كل نوع؛ والآخر يتضمن الأصناف/المدخلات المقاومة فقط. استخدمت 6 بالغات سونة في عدوى كل قفص (1×1×1 م²). اعتمد التقييم للتفضيل أو عدم التفضيل على عدد البيوض الموضوعة/مدخل والضرر الناتج عن تغذية السونة. تم استخدام مقياسين من 1-6 لتقييم ضرر تغذية السونة، اعتمد أحدهما على نسبة الإشطاعات المصابة، واعتمد الآخر على تقزم النبات. بلغت أعلى نسبة إصابة وتقزم على المدخل البري الحساس IG119444 بدرجة 5.6 و 5.1، على التوالي، بينما كان المدخل *Aegilops umbellulata* IG-48404 أقل المدخلات تضرراً بتغذية حشرة السونة بدرجة 1 و 1 لدرجة الإصابة والتقزم، على التوالي. وبلغ أكبر عدد لمجموعات البيض على كل من الشاهدين الحساسين IG119444 وصنف القمح الطري Cham 6، بمجموعتي بيض لكل منهما، في حين لم يوضع بيض على المدخل المقاوم IG48404. وفي اختبار التفضيل بين الأصناف/المدخلات المقاومة، حصل مدخل القمح الطري ICBW من أفغانستان على أعلى إصابة ودرجة تقزم، وأعلى عدد لمجموعات البيض بـ 3.7، 2.5 و 2.4، على التوالي. وحصل المدخل المقاوم *Aegilops* IG48404 على أقل إصابة ودرجة تقزم (1.3 و 0.1، على التوالي) دون وضع أية بيضة.

R 26

استجابة بعض أصناف الشعير المحسنة للإصابة بمن أوراق الذرة *Rhopalosiphum maidis* Fitch. عبد الستار عارف علي، جاسم خلف محمد، بهاء عبد الهادي الراوي وحاتم متعب حسين، الهيئة العامة للبحوث الزراعية، ص.ب 39094، أبوغريب، بغداد، البريد الإلكتروني: abdulsattararif@yahoo.com

يعد من أوراق الذرة *Ropalosiphum maidis* (Aphididae: Homoptera) من الآفات المهمة التي تصيب محصول الشعير في جميع مناطق زراعته في العراق. ويأتي ضرر هذه الآفة من تغذيتها على العصارة النباتية، ونقلها لبعض الفيروسات النباتية إلى المحصول. نفذت دراسات حقلية ومخبرية لمعرفة استجابة بعض أصناف وسلالات الشعير المدخلة أو المستنبطة محليا للإصابة بمن أوراق الذرة خلال الفترة ما بين 2002-2006. أظهرت النتائج أن جميع الأصناف تصاب بهذا المن، مع وجود تباين في الإصابة تبعاً للموسم. وقد أظهرت الأصناف إباء 267 وريحان وإباء 99 قابلية عالية للإصابة تبعاً لأعداد المن التي سجلت عليها، في حين سجلت أقل أعداد للمن على الطراز الوراثي 24-22. وفي إختبارات التفضيل الغذائي، كان الصنف ريحان الأكثر تفضيلاً تلاه الصنف إباء 265، في حين كان الطراز الوراثي 24-22 الأقل تفضيلاً. وقد تباينت أعمار الإناث وأعداد الذرية الناتجة عنها تبعاً للصنف مع تفوق الطراز الوراثي 24-22 في هذه الخواص. ولم تشر النتائج إلى وجود تأثير للإصابة في الصفات المظهرية للنبات.

R 27

دراسة حساسية بعض الأصناف المحلية من القمح والشعير للإصابة بحشرات من النجيليات بمنطقة الجبل الأخضر، ليبيا. هناء صالح العيش¹، إبراهيم محمد الغرياني² وعبد الحميد حسن المبروك². (1) قسم الأحياء، كلية العلوم، جامعة قاربونس، المرج، ليبيا؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني: ghariani99@yahoo.com

هدفت الدراسة إلى معرفة مدى حساسية بعض أصناف القمح والشعير المحلية للإصابة بحشرات المن حقلياً ومخبرياً، حيث بينت النتائج أن أصناف الشعير "وادي القطارة، ليبيا 4، وادي زارت" كانت أكثر تحملاً للإصابة بحشرات المن من أصناف محصول القمح "قمح كريم، قمح صلب، قمح طري" حيث كانت متوسطات أعداد المن على أصناف الشعير في الحقل 5.4، 3.9، 3.9 و 3.9، 4.9 و 5.7، 16.9 مقارنة بمتوسطات أعداده على أصناف القمح والتي بلغت 13.0، 19.3، 11.4 و 16.5، 27.3، 15.1 للموسمين الزراعيين 2002/2001 و 2003/2002، على التوالي، وكانت متوسطات أعداد المن على أصناف الشعير في المختبر 4.4، 3.7، 8.5 و 4.3، 3.6، 7.1 مقارنة بمتوسطات أعداده على أصناف القمح 36.4، 53.8، 27.7 و 11.3، 15.2، 9.8 للموسمين الزراعيين 2002/2001 و 2003/2002، على التوالي. أظهرت النتائج من ناحية أخرى وجود فروقات معنوية بين الأصناف في درجة حساسيتها لحشرات المن، وكان القمح الصلب أكثر حساسية للإصابة، تلاه قمح كريم والقمح الطري، بينما كانت درجة إصابة أصناف الشعير وادي القطارة وليبيا 4 أقل وبصورة معنوية. وتوضح الدراسة أيضاً أن حشرات المن *Ropalosiphum padi* و *Sshizaphes graminum* كانت تغزو المحاصيل بأعداد أعلى من *Sitobian avenae*. بالإضافة إلى أن *R. padi* كان أكثر انجذاباً للقمح الصلب و قمح كريم عن باقي الأصناف، بينما أظهر كل من *S. graminum* و *S. avenae* التفضيل العالي للقمح الصلب والقمح الطري وشعير وادي زارت. وأظهرت النتائج اختلاف وجود المن على أجزاء النبات باختلاف فترات نمو النبات، ولم تختلف معنوياً أعداد المن بين السنابل وسوق النباتات في بداية الإصابة، وكانت أعداد المن على السنابل أكثر منها على السوق مع تقدم الإصابة في الأسبوع الثاني والثالث. كما برهنت البيانات المتحصل عليها أن *R. padi* يفضل التواجد في منطقة الساق والأوراق السفلية أكثر من منطقة السنابل بعكس *S. graminum* و *S. avenae* اللذين يفضلان منطقة السنابل.

R 28

تقييم مجموعة من أصناف العدس البرية *Lens orientalis* Boiss لمقاومتها لسوسة العدس *Sitona crinitus* Herbst. مصطفى البوحسيني، عبد الله جوبي، وأشوتس ساركر، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب 5466، حلب، سورية، البريد الإلكتروني: a.joubi@cgiar.org

تعتبر سوسة العدس (*Sitona crinitus* Herbst)، إحدى الآفات الحشرية المهمة التي تهاجم العدس. تتغذى البالغات على الأوراق وتتغذى البيرقات على المجموع الجذري الحديث وعلى العقد الجذرية، مما يخفض القدرة على تثبيت الأزوت الجوي. وبما أنه لا يوجد مصادر وراثية مقاومة لهذه الآفة في أصناف العدس المنزوع (*Lens culinaris* Medik)، تم تقييم مجموعة من أصناف العدس البرية (*Lens orientalis* Boiss) المتوافرة في وحدة الأصول الوراثية في إيكاردا. حتى الآن تم غربلة 315 مدخلا من *L. orientalis* لاختبار مقاومتها لسوسة العدس. أجريت هذه الغربلة في الحقل في محطة تجارب تل حديا، إيكاردا، تحت الظروف الطبيعية. زرع كل مدخل في خط واحد طوله متر واحد وبمكرر واحد. أعيدت غربلة المدخلات

بمعدل العقد في 10 مكررات لكل صنف 83.5، 6.3، 18.1، 19.66، 19.3، 7.3 و 33.34 عقدة على ديزري، اريندا، مرغريتا، سبونتأ، أطلس، تيمات وصفران، على التوالي. وبلغ متوسط أوزان الجذور 1.99، 0.45، 1.47، 0.23، 1.31، 0.87 و 0.86 غ للأصناف السابقة، على التوالي. تم أيضا حساب عدد الإناث البالغة المكونة على كل صنف، فدلنت نتائج تناسب عدد الإناث مع عدد العقد على وجود تباين كبير بين الأصناف، وبلغت 64.1، 2.3، 3.3، 8.0، 11.7 و 36.09 أنثى بالغة للأصناف ديزري، اريندا، تيمات، مرغريتا، سبونتأ وسافران، على التوالي. أظهرت النتائج أن الأصناف المختبرة تعدد عائلا لهذه النيماتودا خاصة في المناطق الساحلية، وبينت حساسيتها الكبيرة لهذه الآفة.

R 24

حساسية بعض أصناف اللوبياء للإصابة ببعض الآفات الثاقبة الماصة بمصر العليا. نشأت عبد الحافظ علي¹ وأبو المعارف محمد الضمراني². (1) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الدقي، مصر، البريد الإلكتروني: nashat_hafiz@yahoo.com؛ (2) قسم البساتين، كلية الزراعة، جامعة أسيوط، مصر.

تم دراسة تأثير بعض الصفات الخصائص لخمس أصناف من اللوبياء (Tv-21، Six-Weeks، Ch Reds)، في الإصابة ببعض الآفات الرئيسية [الذبابة البيضاء (*Bemisia tabaci* Gannadius) التريبس (*Thrips tabaci* Lind)، الجاسيد (*Padi Empoasca dissicipinen*)، من البقوليات (*Aphis craccivora*) Koch، وأكاروس العنكبوت الأحمر (*Tetranychus urticae* Koch)] بمحافظة أسيوط، في مصر العليا خلال 2001 و 2002. أظهرت النتائج أن أعلى تعداد لهذه الآفات على نباتات اللوبياء سجلت على الصنف Tv-21، وأقلها على صنف B-Crowder و Six-Weeks. وبالنظر إلى قابلية الأصناف المختبرة للإصابة بالآفات الثاقبة الماصة وجد أن كلا من الصنف B-Crowder و Six-Weeks ظهرا كأصناف مقاومة لهذه الآفات، بينما أظهر الصنف Pinkey مقاومة منخفضة. كما أوضحت النتائج أن الصنف Tv-21 قابل للإصابة بكل الآفات المدروسة، كذلك قابليته للإصابة بحشرة من البقوليات. كما لوحظ أيضا عدم وجود اختلافات معنوية بين جميع الأصناف المختبرة في عدد القرون/نبات وعدد البذور/قرن في الأجزاء المعاملة بمادة الملاثيون-500 وغير المعاملة. أظهرت النتائج لهذه الخصائص أن الصنف Tv-21 كان أعلى الأصناف في وزن الحبة (260.1 و 262.3 غرام/ 1000 حبة للغير معاملة والمعامل، على التوالي). ومن ناحية أخرى تم دراسة تأثير 7 أصناف من اللوبياء (وهي الخمسة السابقة بالإضافة إلى الصنفين Balady و IT82D889 في دورة الحياة والكفاءة التناسلية لأكاروس العنكبوت الأحمر عند درجة حرارة 25 °س. أوضحت النتائج أن أقصر دورة حياة للأكاروس سجلت على أصناف Ch-Reds و IT 82 D889 لمقارنة مع الأصناف الأخرى. بينما سجلت أعلى كفاءة تناسلية للأكاروس على أصناف Tv-21، Pinkey و IT 82 D889 (17.22، 16.22 و 15.75 بيضة، على التوالي). وسجلت أقصر فترة حياة (16.33 يوم) على Ch-Reds. وبناء على النتائج السابقة، نستنتج أن الأصناف Tv-21 و Pinkey كانت من الأصناف المفضلة لهذه الآفات بينما كان الصنفين B-Crowder و Six-Weeks أقلها تفضيلا.

R 25

تحفيز مقاومة نباتات القطن المصري ضد الإصابة بديدان اللوز باستخدام منظمات النمو النباتية. محمد محيي الدين علي مكادي، مفتاح عبد العاطي علي، فاروق كامل علي وأحمد صلاح حسين، قسم وقاية النبات، كلية الزراعة، جامعة المنيا، مصر، البريد الإلكتروني: makady51@yahoo.com

أجريت هذه التجربة لتقييم أداء منظمات النمو النباتية في تحفيز مقاومة نباتات القطن ضد الإصابة بديدان اللوز بمزرعة كلية الزراعة بجامعة المنيا خلال عامي 2002 و 2003. استخدم مركبي البيكس والسيكوسيل (منظمات نمو نباتية) رشا مرتين، الأولى في طور البرعم الزهري والثانية عند بداية التزهير، بمعدل 250 مل/فدان. تم استخدام منحنى التزهير، نسبة الإصابة بديدان اللوز، المحصول الفعلي ونسبة الفقد الاقتصادي في محصول القطن كأداة لتقدير نسبة الإصابة بديدان اللوز. كما تم أيضا ملاحظة تأثير هذه المواد في العدد الكلي للأعداء الحيوية. أظهرت النتائج المتحصل عليها أن معاملة نباتات القطن باستخدام منظمات النمو النباتية أدت إلى زيادة العدد الكلي للأزهار، كما أعطت زيادة في منحنى التزهير، وكانت نسبة الخفض في نسبة الإصابة بديدان اللوز 29.2 و 26.49%، على التوالي. كذلك كانت هناك زيادة في المحصول الفعلي بمتوسط 24.51 و 10.45% أعلى من معاملة الشاهد (غير المعامل) في موسمي الدراسة. كما أن استخدام منظمات النمو النباتية سبب خفضا في نسبة الفقد الاقتصادي. وقد أوضحت النتائج أيضا أن تطبيق استخدام البيكس والسيكوسيل أدى إلى نجاح كبير في تحفيز مقاومة نباتات القطن وزيادة العدد الكلي للأعداء الحيوية وخفض في نسبة دخول يرقات ديدان اللوز القرنفلية في طور السكون. اتضح من هذه الدراسة إمكانية استخدام مركبي البيكس والسيكوسيل كمادة جيدة التأثير في برامج مكافحة المتكاملة لديدان اللوز.

(primers) على 4 أصناف من النخيل (اثنان مقاومان واثنان حساسان للمرض). بينت النتائج المتحصل عليها حتى الآن وجود اختلافات كبيرة بين مقاطع البصمات الجزيئية بين الأصناف الحساسة والأخرى المقاومة. وسيتم تعميم هذه الدراسة على عدد كبير من العينات التي جمعت من أصناف أشجار نخيل التمر التي تمتاز بسلوكها المختلف تجاه المرض.

R 21

انتقاء سلالات جديدة من نخيل التمر ذات ميزات وخصائص زراعية واعدة من أجل مكافحة مرض البيوض في المغرب. مولاي الحسن سدر، المنظمة العربية للتنمية الزراعية، مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، ص.ب. 533، المعهد الوطني للبحث الزراعي، مراكش، المغرب، البريد الإلكتروني: sedramh@menara.ma، mhsedra@yahoo.fr، sedramh@hotmail.com

نظرا لخصوصية المرض والفطر الممرض ودورته الحياتية في بيئة الواحات، يعد مرض البيوض من أخطر الأمراض في العالم التي تصعب مكافحتها. تبقى الطريقة الجينية باستخدام الأصناف المقاومة هي الطريقة الوحيدة الفعالة حتى الآن في ميدان الواحات المصابة. إن توزيع وتعميم الأصناف المقاومة في المغرب خلال السبعينيات لم يلقى إقبالا مهما لدى المزارعين بسبب ضعف مستوى جودة تمورها - الشيء الذي جعل من عنصر جودة التمر لقيمتها التجارية - مطلباً ضرورياً لإعادة تعمير الواحات المتضررة. تتابعت البحوث من أجل التحسين الوراثي للنخيل وأسفرت النتائج على انتقاء وابتكار أصناف وسلالات جديدة تحمل في الوقت نفسه جينات الجودة في التمر والمقاومة للمرض. تم انتخاب 8 سلالات أنثوية وسلالتان ذكريتان من بين 60 سلالة تم تقييم ميزاتها وخصائصها. أمتازت السلالات المختارة بميزات وخصائص شكلية وزراعية أفضل من الأصناف المغربية التقليدية والشائعة. نظرا للطلب المتزايد الآن من طرف المزارعين لهذه السلالات، أصبح ضرورياً الإسراع في أكثر هذه السلالات عن طريق الزراعة النسيجية وتعميمها ليس فقط لإعادة تعمير الواحات المتضررة بل أيضاً لإعادة هيكلة الواحات التقليدية ذات الإنتاجية ضعيفة كما ونوعاً.

R 22

استخدام المعلق الخلوي لأنسجة نخيل الثمر المعالجة بأشعة جاما في برنامج انتخاب نباتات أكثر مقاومة لمرض البيوض. علي المحجوب¹، لطفي الفقي¹، رياض دريرة¹، م. حسن سدر² ونور الدين دريرة¹. (1) مخبر بيوتكنولوجيا النبات، كلية العلوم، ص.ب. 802، صفاقس 3018، تونس، البريد الإلكتروني: a_almahjoub@yahoo.fr؛ (2) المركز الجهوي للبحث الزراعي، مختبر أمراض النبات، ص.ب. 533، مراكش، المغرب.

تظل زراعة نخيل التمر من أهم مقومات التوازن الاجتماعي والاقتصادي والبيئي في المناطق الجافة وشبه الجافة والحارة. غير أن خطراً جسيماً محدقاً بهذه الزراعة يهدد هذه المعادلة متمثلاً في مرض الذبول الوعائي (البيوض) الناتج عن فطر *Fusarium oxysporum* f. sp. *albedinis* لاسيما بعد ظهوره في المغرب والجزائر. تظهر تقنيات زراعة نسج نخيل التمر كسبيل جدي للتحسين بهدف الانتخاب في مستوى المقاومة لمرض البيوض إلى جانب صفات وراثية أخرى. تتم في هذه الدراسة معالجة المزارع النسيجية لنخيل الثمر بأشعة جاما لحدوث طفرات انتخب نباتات مقاومة للبيوض. إضافة إلى إمكانية الانتخاب في مستوى النباتات الخضرية غير المؤقلمة، فتح الانتخاب في مستوى المعلق الخلوي الجيني أفاقاً رحبة لإسراع البرنامج وكذلك من أجل دراسة تفاعلات المرضية في الزجاج. وقد رافق برنامج الانتخاب الأولي للنباتات التي كانت أكثر مقاومة للبيوض تحاليل حيوية بيوكيميائية وجزيئية لاستكشاف مؤشرات محتملة للمقاومة والمساهمة في فهم هذه الظاهرة المرضية التي تبقى جوانب كثيرة منها متسمة بالغموض.

R 23

دراسة حساسية سبعة أصناف من البطاطا/البطاطس المزروعة إزاء لنيماتودا تعقد الجذور في الجزائر. السيد ميلود حماش، المعهد الوطني للعلوم الفلاحية، حسان بادي، الحراش، الجزائر العاصمة، 16200، الجزائر، البريد الإلكتروني: hammacheh@yahoo.fr

إن تطور زراعة البطاطا/البطاطس والمحاصيل الأخرى التي تعتبر عائلاً لنيماتودا تعقد الجذور جعل من إدارة هذه الآفة أمراً صعباً للغاية، ويعود السبب في ذلك لتعدد أجيال هذه الديدان الداخلية التطفل ولتأثيراتها الضارة في المحاصيل. تم إجراء تجارب على 7 أصناف من البطاطا/البطاطس والتي تشغل حيزاً كبيراً في السوق الجزائرية (دزيري الحساس جداً لهذه الديدان، صفران، اريندا، مرغريتا، سبونتا، اطلس وتيمات). تم زراعة الأصناف في علب بلاستيكية شفافة وبغطاء محكم، ذات قطر يقدر بـ 5 سم وارتفاع 8 سم مع تربة مبللة بكمية من الماء لتمكين براعم البطاطا/البطاطس من الانتاش، بعدها تم حقن ما يعادل 300 يرقة طور ثاني من نيماتودا تعقد الجذور (*Meloidogyne incognita*، *M. arenaria* و *M. javanica*) في كل العلب والمتمثلة في 10 لكل صنف. أثبتت النتائج المتحصل عليها بعد 3 أشهر من الزراعة ومقارنة مع صنف دزيري (الحساس للإصابة) حساسية كل الأصناف المختبرة ومكنت الديدان من التطور فيها. بلغ عدد العقد المكونة على الجذور مقدراً

النبات المطعم ما بين 0.0 (كريمسون تايد/ قرع - 2002) و 80.3% (كريمسون تايد/ يقطين - 2002) بالمقارنة مع غير المطعم، والزيادة في متوسط وزن ثمرة النبات المطعم ما بين 1.1 (كريمسون تايد/ ليف - 2004) و 136.4% (بيوتي سيد/ يقطين - 2002)، والزيادة في متوسط عدد الثمار التي يعطيها النبات المطعم ما بين 23.8 (كريمسون سويت/ ليف - 2004) و 119.5% (كريمسون سويت/ يقطين - 2003). وأثرت الأصول المختبرة بصورة متباينة في مواصفات ثمار الأصناف المطعمة ولا سيما في ثخانة القشرة. وكانت نسب تصافي اللب أقل في الأصناف المطعمة لا سيما على القرع بالمقارنة مع غير المطعمة. ولم يسجل تمايز واضح في محتوى الثمار من الرطوبة أو المادة الجافة أو الرماد. وأظهرت بعض الأصول، مثل Emphasis تأثيراً إيجابياً في كمية السكريات الكلية في ثمار الأصناف المطعمة (ساكاتا أو كريمسون سويت - 2003)، وكان هذا التأثير سلبياً في تركيبات أخرى.

R 18

تقويم المقاومة لمرض البيوض عند شتلات هجينة لنخيل التمر باستخدام الإلفاح والمواد السامة المفرزة من طرف الفطر *Fusarium oxysporum f. sp. albedinis*. منى الكسمي¹ ومولاي الحسن سدر². (1) مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، ص.ب. 533، مراكش، المغرب، البريد الإلكتروني: K_moni216@yahoo.com؛ (2) المنظمة العربية للتنمية الزراعية، المغرب، البريد الإلكتروني: mhsedra@yahoo.fr، sedramh@hotmail.com

لنخيل التمر دور اجتماعي واقتصادي مهم في الوطن العربي. ويعد البيوض الذي يسببه فطر *Fusarium oxysporum f. sp. albedinis* أخطر الأمراض التي تصيب أشجار النخيل، حيث أدى إلى القضاء على أكثر من 13 مليون نخلة في المغرب والجزائر. تبقى المكافحة الوراثية/الجينية باستخدام أصناف النخيل المقاومة للمرض أنجع الطرائق المتوافرة حالياً للحد من انتشار المرض. بقصد العثور على سلالات جديدة هجينة مقاومة، تم إجراء تجارب لتقييم المقاومة باستخدام لقاح من الفطر بالمقارنة مع المواد السامة التي يفرزها (Toxins). أسفرت النتائج على العثور على 70% من السلالات حساسة للمواد و30% مقاومة وذلك من بين مجموعات عديدة من شتلات هجينة تم الحصول عليها من تهجينات محددة.

R 19

البحث عن المتغيرات الجينية لفطر الفوزاريوم المسبب لمرض البيوض عند نخيل التمر. يوسف الهلالي علوي¹ ومولاي الحسن سدر². (1) مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، مراكش، المغرب؛ (2) المنظمة العربية للتنمية الزراعية، مراكش، المغرب، البريد الإلكتروني: hilalialaoui@yahoo.fr

يعتبر مرض البيوض من بين أخطر الأمراض التي تصيب نخيل التمر في شمال إفريقيا، حيث يسبب لوحده في القضاء على ثلثي نخيل المغرب وأكثر من ثلاثة ملايين نخلة بالجزائر. تدخل هذه الدراسة ضمن برنامج المشروع الاقليمي للكشف المبكر عن مرض البيوض في الدول العربية والذي تشرف عليه المنظمة العربية للبحث الزراعي، وتهدف من خلالها البحث عن الخصائص والمتغيرات الجينية لفطر الفوزاريوم المسبب لمرض البيوض. تم تنظيم مجموعة من الزيارات الميدانية للواحات الموبوءة بالمرض، وأخذت عينات من سعف النخل المصاب ومن تربة المكان ذاته. تم التعرف على فطر الفوزاريوم المسبب للمرض، بعد زرعه في وسط غذائي إنتقائي، انطلاقاً من خصائصه المورفولوجية. تم استخلاص الحامض النووي لحوالي 100 عزلة، كل على حده جها من المغرب وبعضها من الجزائر. تم استخدام الحامض النووي المتحصل عليه في دراسة المتغيرات والصفات الجينية للفطر باستخدام أكثر من 40 بادناً أعطت عدداً كبيراً من البصمات الجينية. خلال هذه المناقشة تم مقارنة المتغيرات الجينية للفطر المسبب للبيوض وفقاً لتوزعه الجغرافي، وكذلك مقارنته مع فطر الفوزاريوم المعزول من تربة مجموعة من الدول العربية.

R 20

البحث عن الجينات المتحركة في مقاومة أشجار نخيل التمر لمرض البيوض باستخدام البصمات الجينية الوراثية. منى الكسمي¹ ومولاي الحسن سدر². (1) مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، ص.ب. 533، المغرب، البريد الإلكتروني: K_moni216@yahoo.com؛ (2) المنظمة العربية للتنمية الزراعية، مراكش، المغرب، البريد الإلكتروني: mhsedra@yahoo.fr، sedramh@hotmail.com

يعد مرض البيوض من أخطر الأمراض التي تصيب أشجار نخيل التمر والذي يسببه فطر *Fusarium oxysporum f. sp. albedinis*. وكانت أضرار المرض كبيرة على النخيل في شمال أفريقيا وخصوصاً في الواحات المغربية والجزائرية، وشكل تهديداً لأشجار النخيل في الدول المجاورة. يعد تطور واستخدام تقانات البصمات الجينية الوراثية مثل RAPD من أهم السبل التي قد تمكن من تحديد الجينات المرتبطة بمقاومة البيوض لدى نخيل التمر. وفي هذا الصدد تم إختبار 72 بادناً

بالأملاح إلى تأثيرات معنوية في الحفاظ على صفات نضج الثمار مثل الصلابة والنسبة النوية للمواد الصلبة الكلية والحموضة وكثافة اللون وكذلك على فيتامين C في الثمار مما أدى إلى تأخير النضج وإطالة فترات التخزين. ظهرت أيضاً زيادة مضاعفة في محتوى جدر الخلايا الثمار من الكالسيوم للأصناف كاماروزا، روزالندا وشاندلر التي عوملت بكل من كلوريد الكالسيوم وسليكات الكالسيوم بمعدل 1، 2 و 4 غ/لتر مقارنة مع الثمار غير معاملة. كما أظهرت دراسات الميكروسكوب الإلكتروني تراكم الكالسيوم في جدر خلايا ثمار الفراولة صنف كاماروزا عند المعاملة به قبل الحصاد بمعدل 5 غ/لتر.

R 15

تأثير بعض العناصر الغذائية وحمض الساليساليك في المقاومة الجهازية لنباتات الخيار ضد الفطر *Pythium aphanidermatum*. آلاء خضير حسان وصالح حسن سمير، مختبر المبيدات، جامعة بغداد، العراق، البريد الإلكتروني salehsamir2004@yahoo.com:

أجريت هذه الدراسة في كلية الزراعة بجامعة بغداد لتقييم مقاومة بادرات الخيار إزاء مرض تعفن البذور وموت البادرات المتسبب عن الفطر *Pythium aphanidermatum* (Edson) Fitz باستخدام العناصر الغذائية وحمض الساليساليك. أظهرت النتائج المختبرية فاعلية عالية لعنصر النحاس في خفض معدل نمو الفطر *Pythium aphanidermatum* وزيادة نسبة تثبيط نموه التي بلغت 83.6% وذلك عند استخدام بمعدل 25 مغ/لتر، بينما بلغت نسبة التثبيط التي أحدثها استخدام السليكون بمعدل 400 مغ/لتر حوالي 81.9%. وخفض استخدام حمض الساليساليك وعنصري النحاس والسليكون النسبة النوية لموت البادرات وشدة الإصابة اللتان بلغتا 0.0، 3.3، 3.3 و 0.0، 15 و 0.6%، على التوالي، بينما كانتا في معاملة الشاهد المصاب 6، 76 و 83.3، على التوالي.

R 16

تقدير مقاومة سوق نبات الفلفل الحلو (*Capsicum annuum*) ضد الفطر *Phytophthora capsici*. عبد الهادي قشي¹ ومسعودة بن عبد القادر². (1) مخبر أمراض النبات، كلية العلوم، جامعة فرحات عباس، سطيف 9000، الجزائر؛ (2) قسم البيئة، كلية العلوم، جامعة جيجل، الجزائر، البريد الإلكتروني: yamina_messaouda@yahoo.fr

استعمل الاختبار الكمي بهدف انتخاب الأصناف المقاومة من الفلفل الحلو (*Capsicum annuum*) المتواجدة في الأسواق الجزائرية ضد سلالات الفطر *Phytophthora capsici* التي عزلت من مناطق مختلفة، وذلك بقياس مساحة التماوت الممتدة من قمة الساق إلى أسفله كل ثلاثة أيام مرة من بعد إجراء العدوى ولمدة 15 يوماً. أظهر قياس إصابة الأصناف المختبرة أن كلها لها استجابة تجاه الفطر *Phytophthora capsici* ولكن بفروق معنوية. سجل الصنف 'Italico' مقاومة أعلى وذلك بقيمة 41.43 مم، بينما سجل الصنف 'Esterel' حساسية أعلى وذلك بقيمة 102.88 مم. نقرح مضاعفة المصدر المقاوم 'Italico' وذلك بالالاقح الذاتي خاصة أنه يمتلك صفات شكلية مرغوبة من طرف المستهلك، والبحث على مصادر أخرى مقاومة لهذا المرض تتأقلم مع كل الظروف البيئية.

R 17

تقييم حساسية بعض أصول القرعيات إزاء الفطر *Fusarium oxysporum* f. sp. *niveum* مسبب ذبول البطيخ الأخضر في سورية، وتأثيرها في إنتاج الأصناف المطعمة ومواصفاتها. لينا مطرود¹، صلاح الشعبي¹، هوش جروس² وجرجس وهبة². (1) إدارة بحوث وقاية النبات؛ (2) مركز البحوث العلمية الزراعية في جوسية الخراب، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarshaabi@mail.sy

تم تقييم حساسية بعض أصول القرعيات المستوردة مثل: Strong Tosa (*Cucurbita maxima* X *Cucurbita*) (*moschata*)، (*Cucurbita lagenaria* F₁) Emphasis، Sun hybrid 6001F، وبعض الأصول المحلية، مثل: القرع العسلي (*Cucurbita maxima*)، قرع القناني (*Lagenaria siceraria*) والأركيلة (*Lagenaria longissima*)، والليفي (*Luffa cylindrica*)، والحنظل (*Citrullus colocynthis*)، والللمبة (*Cucurbita pepo pyriform*) تجاه الفطر *F. o. f. sp. niveum* (سلالة رقم 2). وكانت كل الأصول المختبرة مقاومة للمرض باستثناء *C. colocynthis*، الذي كان عالي الحساسية. وتراوحت نسب توافق تطعيم هذه الأصول مع بعض أصناف البطيخ الأخضر المتداولة، مثل: Crimson Tide، Buity seed، Dumara، و Sakata ما بين 35-85% تحت ظروف البيت الزجاجي، وما بين 64.8-98.2% تحت النفق البلاستيكي. وكانت الأركيلة والليفيين و Emphasis أكثرها توافقاً (85.7-98.2%)، بينما كان القرع أقلها توافقاً (64.8-65.7%) بعد 11 يوماً من التطعيم. وكانت الأصناف المطعمة مقاومة للمرض مقارنة مع الأصناف غير المطعمة تحت ظروف العدوى الاصطناعية في البيت الزجاجي أو في الحقل. وبلغت نسبة الزيادة في عدد الأفرع التي يعطيها النبات المطعم حدها الأعظمي 62.1% (كريمسون سويت/ يقطين - 2003). وتراوحت الزيادة في متوسطات طول

بارتفاع النباتات وانخفاض عدد البراعم الزهرية ونسبة العقد فضلا عن شكل الثمار وصغر حجمها مقارنة بنباتات البندورة/الطمطم الناتجة من الكالس والبذور. كما أظهر حساب العدد الكروموسومي للنباتات المنتخبة المقاومة للفطرين *F. solani* و *F. oxysporum* حصول نقصان في عدد الكروموسومات مقارنة بأعدادها في النباتات الناتجة من البذور والكالس غير المعامل بالرواشح.

R 12

تقييم أصناف فول لمقاومة الصدأ والبياض الدقيقي تحت ظروف النظام الإنتاجي المروي والمطري في إقليم المرتفعات الجنوبية باليمن. يحيى عبد الله مولي الدويله¹ وعبد الرحمن الشامي². (1) قسم المحاصيل، محطة أبحاث إقليم المرتفعات الجنوبية (تعز وإب)، الهيئة العامة للبحوث الزراعية. ص.ب. 5788، اليمن، البريد الإلكتروني: yaldoila@yahoo.com؛ (2) قسم وقاية النبات، محطة أبحاث إقليم المرتفعات الجنوبية (تعز وإب)، الهيئة العامة للبحوث الزراعية، ص.ب. 5788، اليمن، البريد الإلكتروني: alshamiar@yahoo.com

تم تقييم ثمانية أصناف فول تتباين في مستوى المقاومة للصدأ والبياض الدقيقي (*Erysiphe polygoni*) تحت ظروف النظام الإنتاجي المروي والمطري في إقليم المرتفعات الجنوبية في الفترة 2003-2005. اشتملت التجربة على خمسة طرز وراثية متحصل عليها من المركز الدولي للبحوث الزراعية في المناطق الجافة-إيكاردا (A-87، R-62، A-86، FBV2) و (R-27) بالإضافة إلى صنفين محليين قابليين للإصابة (بعداتي وصبري)، وطرز جديد أنتخب في الموسم المطري 2003 من الطراز R-27 على أساس صفة المقاومة للصدأ. كان الصدأ هو المرض الأكثر انتشاراً في المواسم الصيفية بينما كان البياض الدقيقي هو المرض الأكثر انتشاراً في مواسم الربيع. أظهر تحليل التباين لشدة الإصابة بالصدأ والبياض الدقيقي وجود فروقات معنوية بين الطرز الوراثية المختبرة إذ كان الطراز المنتخب هو الأكثر مقاومة للصدأ، لكن درجة إصابته بالبياض الدقيقي كانت متوسطة مقارنة بالطرز الأخرى التي تدرجت إصابته بالمرضين ما بين المتوسطة والشديدة جداً. أظهرت النتائج أيضاً وجود فروق معنوية بين الطرز في المؤشرات الإنتاجية ومكوناتها، إذ تفوقت الطرز الوراثية المنتخبة معنوياً في الإنتاجية الحيوية وإنتاجية قرون وإنتاجية الحبوب يليها الطرازان R-27 و A-87 سواء تحت ظروف الإنتاج المروي أو المطري. كما تميزت هذه الطرز بأفضل الخصائص الإنتاجية مثل عدد القرون في النبات وعدد الحبوب في القرن، وزن الألف الحبة ومؤشر الحصاد، وكذا درجة تكوين العقد الجذرية.

R 13

تكوين نباتات مقاومة لمرض التعفن الطري المسبب من بكتريا *Erwinia caratovora* من كالس السوق للبطاطا/البطاطس. هناء سعيد الصالح ونديم احمد رمضان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com

تهدف الدراسة الى امكانية تكوين نباتات بطاطا/بطاطس تمتلك صفة المقاومة لمرض التعفن الطري الذي تسببه بكتريا *Erwinia*. واستخدم لهذا الغرض نظام زراعة الأنسجة النباتية للبطاطا حيث تم استحداث الكالس من قطع السوق بزراعتها على أوساط MS مضافا اليها منظمات النمو NAA و IBA من الأوكسينات مع BA من الساييتوكاينينات. وبينت النتائج أن وسط MS المضاف إليه 1.0 ملغ/ليتر من كل من NAA و BA كان الأفضل في تشجيعه لاستحداث الكالس، بعد ذلك تم انتخاب قطع من الكالس المقاوم للبكتريا ومن ثم تم الحصول على نباتات من الكالس المقاوم للبكتريا باستخدام وسط MS مضافاً إليه IBA مع BA. جرى بعد ذلك تجذير الأفرع الخضرية ونقلت النباتات إلى التربة. وشملت الدراسة أيضاً مقارنة التغيرات المظهرية والعدد الكروموسومي للنباتات المقاومة مع معاملة السيطرة .

R 14

تحريض عنصر المقاومة وإطالة فترات عرض ثمار الفراولة/الفريز بتطبيق رش المجموع الخضري بأملح الكالسيوم. سنية محمد النشوي¹، عبد الغني بدر²، حسين رشدي عبد العال² وهمام الدين حنيش يونس¹. (1) أمراض ما بعد الحصاد معهد أمراض النباتات، مركز البحوث الزراعية، الاورمان 12619، الجيزة، مصر؛ (2) أمراض نبات، قسم النبات الزراعي، كلية زراعة الأزهر، مصر، البريد الإلكتروني: el_kholi@yahoo.com

أدى تطبيق أملاح كلوريد الكالسيوم، نترات الكالسيوم وسلفات الكالسيوم بمعدل 3، 5 و 10 غ/ليتر وكذلك سليكات الكالسيوم بمعدل 2 و 4 غ/ليتر رشا على نبات الفراولة/الفريز قبل الحصاد على الأصناف كاماروزا، روزالدا، شاندر وسيكوريا إلى انخفاض معنوي في نسبة الإصابة بالفطريات *Botrytis cinerea*، *Rhizopus stolonifer*، *Phytophthora cactorum* و *Alternaria alternata* المسببة لأعفان ما بعد الحصاد. كما أدى إلى الحد من معدل التطور الظاهري للتعفن على ثمار الفراولة/الفريز بعد 32 يوماً من التخزين المبرد إذ كان التأثير أكثر وضوحاً عند تطبيق كلوريد الكالسيوم على الصنف كاماروزا يتبعه باقي الأملاح الأخرى. إلا أنه وجد تأثير ضعيف لتلك الأملاح في نمو الفطريات مخبرياً. أدت أيضاً المعاملة

المساحة الواقعة تحت منحى الإصابة المرضي إلى حد كبير ومن ثم فإنه من المتوقع أن تصبح هذه المقاومة أكثر أمدا وأطول بقاء واستمرارية.

R 9

أوراق البادرات المفصولة تقانة واحدة لغربلة أصناف القمح القاسي تجاه مقاومة الفطر *Stagonospora nodorum*. عبد الحميد الرمضاني¹ وبتريس هالاما². (1) المعهد الوطني للبحث الزراعي، المركز الجهوي، مكناس، المغرب؛ (2) المعهد العالي للزراعة، جامعة ليل، فرنسا، البريد الإلكتروني: ramhamid@hotmail.com

تم تقويم درجة مقاومة 12 صنفا من القمح الصلب/القاسي لمرض التبقع السببوري المتسبب عن الفطر *Stagonospora nodorum* مستعملين تقانة أوراق البادرات المنزلة/المفصولة. أظهرت نتائج هذا البحث فاعلية التقنية المستعملة في إظهار درجة التفاوت بين الأصناف في مقاومة المرض. وكان الصنفان أم الربيع وكيبيروندا الأشد قابلية للإصابة، بينما أبدت الأصناف مرزاق وإيسلي وأورغ درجة كبيرة من المقاومة. تبين كذلك وجود تفاوت كبير بين العينات من حيث طول المساحة الصفراء والمساحة اليابسة الناتجتان عن المرض. كان الترابط بين هاتين المساحتين إيجابياً وقوياً.

R 10

دراسة تأثير سلالات محددة من الصدأ الأصفر في بعض أصناف القمح الطري ومقارنة رد فعلها في طوري البادرة والنبات البالغ. شغلة خاروف¹، عمر يحيوي²، فواز العظمة¹، محمد شفيق الحكيم³ ومها الأحمد². (1) كلية الزراعة، جامعة دمشق، دمشق، سورية؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص. ب 5466، حلب، سورية؛ (3) كلية الزراعة، جامعة حلب، حلب، سورية، البريد الإلكتروني: shoulakharouf@yahoo.com

يحدث مرض الصدأ الأصفر Yellow أو المخطط Stripe (rust) على القمح المتسبب عن الفطر الدعامي *Puccinia striiformis* West f.sp. *tritici* والذي يصيب القمح في المناطق الباردة ذات الرطوبة العالية أضراراً جسيمة نظراً لظهوره المبكر مقارنة ببقية الأصدنة التي تظهر عادة قرب نهاية موسم النمو. من المعروف أن هناك نوعان من المورثات تتحكم بصفة المقاومة للصدأ الأصفر (المخطط) منها مورثات تتحكم بصفة المقاومة في مرحلة النبات البالغ. وانطلاقاً من ذلك فإن مورثات المقاومة المتوفرة في القمح تختلف في فاعليتها باختلاف مراحل تطور النبات، وهذا يعني إمكانية وجود مورثات تطور من فاعليتها مع تقدم النبات في النمو. أجريت الدراسة على 41 صنفاً وسلالة من القمح الطري، واستخدم في الأعداء خليط من الأبواغ اليوريدية من السلالتين 38 E150 و 230 E150، واستخدم في الموسم الثاني أيضاً سلالتان هما 230 E150 و 6 E 16 بالإضافة إلى خليط من الأبواغ اليوريدية. تم تحديد شدة الإصابة ورد فعل النبات في طور النبات البالغ (Disease Severity) باستخدام مقياس من 1-100 ونمط العدوى (infection type) وحساب متوسط معامل الإصابة (Average coefficient of infection) لكل من المعاملات الثلاث. ويعدّ الموعد الذي يتم فيه أخذ القراءات أحد العوامل المؤثرة في شدة الإصابة ونمطها، ولقد اعتمد متوسط شدة الإصابة أعلى نمط إصابة في المواعيد الثلاثة وكذلك دراسة رد فعل النبات في مرحلة البادرات باستخدام مقياس 0-9. تبين أن الصنف Jupateco73S كان حساساً في كلا المرحلتين، بينما كان الصنف sardari مقاوماً في كلا المرحلتين. وكان الصنف corella حساساً في مرحلة البادرة ومقاوماً في مرحلة النبات البالغ. بينما كان الصنف Avost مقاوماً في مرحلة البادرة وحساساً في مرحلة النبات البالغ. مما تقدم نؤكد على أن المقاومة الأفقية هي الأكثر ثباتاً في مواجهة العامل الممرض.

R 11

انتخاب نباتات البندورة/الطماطم المقاومة للذبول الفيوزاري *Fusarium oxysporum* و *F. solani* بواسطة زراعة الانسجة. نديم أحمد رمضان¹، مزاحم قاسم الملاح² وعدنان محمود عبد الله². (1) قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق؛ (2) قسم علوم الحياة، كلية التربية، جامعة الموصل، العراق، البريد الإلكتروني: dr_mozahimkassim@yahoo.com

تم استحداث الكالس من زراعة سوق البندورة/الطماطم على أوساط MS الحاوية على تراكيز متباينة من منظمات النمو. وكان لقطع السوق قابلية عالية على استحداث الكالس، تليها الأوراق واخفقت قطع الجنور في ذلك. وكان وسط MS المدعم بـ 2.0 مغ/ليتر kin. و 2 مغ/ليتر من NAA أفضل وسط لاستحداث الكالس من السوق. أمكن انتخاب مزارع كالس مقاومة لرواشح الفطريات *Fusarium oxysporum* و *F. solani* من مزارع نمو الكالس المضاف إليها الرواشح بتراكيز 2، 5، 10، 15 و 20% وخاصة عند التركيزين الأخيرين. أدى تمييز الكالس في الحصول على نباتات بندورة/الطماطم مقاومة لرواشح الفطريات *F. solani* و *F. oxysporum* بالرغم من الانخفاض الواضح في قابلية الكالس المقاوم على التمايز وتكوين الأفرع الخضرية إلى 30%. ومن الملاحظات البارزة ظهور تباينات مظهرية على نباتات البندورة/الطماطم المقاومة متمثلة

(معلق بوغي بدءاً من مزارع فطرية على بذور الحمص، بذور ملوثة، بقايا مصابة، وشاهد بدون معاملة) القطع الثانوية؛ في حين مثل وقت الإعداء (مبكر، متوسط، متأخر) القطع تحت الثانوية. وقد تم في التقويم اعتماد دليل جديد يأخذ في الحسبان شدة الإصابة (1-9) ونسبة حدوثها (0-100%) في كل معاملة. وأظهرت النتائج تأثيراً عالي المعنوية ($P < 0.01$) للأصناف، ونمط اللقاح ووقت الإعداء؛ وتأثيراً معنوياً ($P = 0.03$) للتأثر ما بين الصنف × نمط اللقاح × وقت الإعداء مما يشير إلى أهمية تأثير نمط العدوى ووقت الإعداء في استجابة الحمص للفحة أسكوكيتا. وتم الحصول على أعلى الأدلة المرضية على الصنفين عند استخدام البقايا المصابة في كافة المواعيد والمعلق البوغي في الموعد المبكر. وقد تعزى الأدلة المرضية العالية التي أحدثتها البقايا النباتية إلى الإعداء المستمر للقاح الذي دعم حدوث الوباء خلال الطور الطفيلي لدورة المرض. وستتم مناقشة الميزة النسبية للاستخدام المبكر للبقايا النباتية المصابة في تقويم الحمص لمقاومة لفحة أسكوكيتا.

R 7

الكشف عن حساسية 10 طرز حولية-محلية من النفل/الفصّة إزاء مرض الساق السوداء الربيعي المتسبب عن الفطر *Phoma medicaginis var. medicaginis*. نضرة بومدين وزواوي بوزناد، مخبر الفطريات، قسم علم النبات، المعهد القومي للعلوم الفلاحية، الجزائر العاصمة، الجزائر، البريد الإلكتروني: sabrina_20725@hotmail.com
تعدّ الساق السوداء المتسببة عن الفطر *Phoma medicaginis var. medicaginis* مرضاً شائعاً على الفصّة في الجزائر، أحدثت انخفاضاً ملموساً في الإنتاج وأساعت إلى نوعيته. تتم مكافحة المرض عادةً بالتربية لانتخاب أصناف مقاومة. أجريت عدوى اصطناعية لنبيتات وأوراق معزولة من عشرة أصناف محلية حولية من النفل/الفصّة بواسطة عزلتين من الفطر المسبب للمرض. استخدم تدرجين مختلفين في تقييم حساسية نباتات هذه الطرز وأوراقها المعزولة. ظهرت أعراض المرض على جميع الأصناف المختبرة، ولوحظ وجود تباين معنوي في مقاومة المرض ما بين الأنواع من جهة وما بين طرز النوع الواحد من جهة أخرى. وأظهرت بعض الطرز المختبرة درجة مقبولة من المقاومة.

R 8

المقاومة طويلة الأمد لمرض صدأ الأوراق عند بعض أصناف القمح المصرية. أسامة أحمد بعلط، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، 9 شارع جامعة القاهرة، الجيزة، مصر، البريد الإلكتروني: samee_999@yahoo.com
يعتبر مرض صدأ أوراق القمح أكثر أمراض الأصداء إنتشاراً في معظم مناطق زراعة القمح بمصر والعالم. وبصفة عامة فإن معظم أصناف القمح المصرية قد روعي عند تربيتها وإنتاجها أن تتمتع بدرجة مقبولة من المقاومة الحقلية لفطريات الأصداء الثلاثة وخاصة صدأ الأوراق. ولسوء الحظ فإن بعض هذه الأصناف قد أستبعدت من الزراعة على المستوى التجاري بعد فترة قصيرة جداً من إنتاجها وذلك لإصابتها السريعة بمرض صدأ الأوراق مثل صنفى جيزة 135 وجيزة 139. بينما ظلت بعض هذه الأصناف محتفظة بمقاومتها للمرض لفترة طويلة، حيث أظهرت مستويات عالية ومقبولة للمقاومة ضد معظم سلالات الفطر السائدة في مصر وتحت ظروف بيئية متباينة بالحقل ولسنوات عديدة منذ إنتاجها وحتى الآن. وقد تم إختيار 12 صنفاً من تلك الأصناف بهدف دراسة وتقييم مدى ما تتمتع به تلك الأصناف من مقاومة جزئية (طويلة الأمد) ضد مرض صدأ الأوراق وقد تم زراعتها في محطتي البحوث الزراعية بالنوباريو وإيتاي البارود لثلاثة مواسم زراعية متتالية (2003/2002، 2004/2003 و 2005/2004). وقد إتضح من نتائج الدراسة قدرة بعض أصناف القمح المختبرة مثل جيزة 168 وسخا 93 وسخا 94 وجميزة 9 وجميزة 10 على إبطاء تطور المرض وإظهار مستويات عالية من هذا النوع من المقاومة (المقاومة الجزئية). وأظهرت هذه المجموعة من الأصناف مستويات منخفضة من شدة الإصابة بالمرض (لم تزيد عن 20%) وتبطيء سرعة تزايد إنتشار المرض (أقل من 0.124) إضافة إلى القيم المنخفضة من المساحة الواقعة تحت منحنى الإصابة المرضي إذ لم تزيد عن 176.2. وأظهرت باقي الأصناف بما فيها صنف جيزة 139 المستخدم كشاهد عالي القابلية للإصابة الذي تميز بمستويات عالية من شدة الإصابة وسرعة عالية في معدل زيادة المرض، وبالتالي أعطى قيمة عالية للمساحة الواقعة تحت منحنى الإصابة المرضي مقارنة بالمجموعة السابقة وذلك تحت ظروف الحقل بمحطتي البحوث الزراعية خلال سنوات الدراسة المختلفة. وقد أجريت تجارب تحت ظروف الدفيئة الزجاجية لتحديد المورثات المحتمل توأجدها والمسئولة عن مقاومة صدأ الأوراق في كل صنف من الإثني عشر صنفاً المختبرة. وقد اتضح من نتائج هذه التجارب إحتمال وجود عدد كبير من المورثات المسئولة عن مقاومة المرض (تراوحت ما بين 7 إلى 25 مورثاً) وذلك بالأصناف التي قد تميزت بقدرتها على المقاومة الحقلية (المقاومة الجزئية) خلال سنوات الدراسة الثلاثة. وبالمقابل فقد ثبت إحتواء الأصناف ذات القابلية العالية للإصابة (سريعة الإصابة بالصدأ) بما فيهم الصنف جيزة 139 (المستخدم كشاهد) على أعداد قليلة جداً من تلك المورثات. وثبت أيضاً عدم احتواء الصنف سدس 1 على أي من مورثات المقاومة المختبرة. وعموماً فإن تراكم أو تجمع عدد كبير من المورثات المسئولة عن مقاومة مرض صدأ الأوراق في أي صنف من أصناف القمح يؤدي إلى زيادة قدرة هذا الصنف على تأخير وتباطؤ إنتشار وتطور المرض أثناء الموسم مما يؤدي بدوره إلى إنخفاض شدة إصابة هذا الصنف بالمرض وتقليل قيم

واققتصادية لإدارة المرض وتقليص الخسائر التي يحدثها. وقد أفادت الأعمال السابقة في المركز عن مصادر المقاومة في الأصول الوراثية من العدس صغير الحبة أحمر الفلقات، واعتمدت عديد من البرامج الوطنية في المنطقة وما وراءها عددا من الأصناف المقاومة. على أن مصادر المقاومة في العدس كبير الحبة أخضر الفلقات غير مدروسة بشكل جيد. وتبذل حالياً جهوداً حديثة لتعريف أصول وراثية مقاومة. تم عمل مجموعة من 257 مدخلا للعدس كبير الحبة، من بينها 41 مادة تربية و 216 أصلاً محلياً مجموعة من 32 بلداً لتعريف أصول وراثية مقاومة وقومت في المشتل المرضي لذبول العدس بتل حديا، إيكاردا. وقد قومت المدخلات المختبرة خلال موسم النمو 2006 في خطوط بطول 50 سم/مدخل زرع في كل منها 50 بذرة، بإتباع تصميم إحصائي كامل العشوائية وبثلاث مكررات. واستخدم الصنف "Precoz" الحساس ذو الأصل الأرجنتيني كشاهد وزرع بعد كل أربع خطوط مختبرة. وتم تقدير شدة المرض، كنسبة مئوية للنباتات الذابلة، ثلاث مرات من مرحلة الأزهار/تشكل القرون إلى طور النضج وبفاصل 7-10 أيام بين التقويم والآخر. وتم تبني أعلى شدة لكل مدخل، في أي من المكررات وفي أي من التقويمات كقيمة نهائية. واعتبرت المدخلات التي تقل فيها شدة الإصابة عن 20% مدخلات مقاومة. ومن بين المدخلات المختبرة كانت نسبة المدخلات المقاومة التشيلية 41.8% والإسبانية 11.5% تلتها المدخلات المطورة في إيكاردا (34%). ولم يتم العثور على أي مصدر للمقاومة في المدخلات من إيران (18/0 مدخل) ومن سورية (0-40 مدخلا). وعثر على مستو منخفض جداً من المقاومة في المدخلات من تركيا (21/1 مدخلا). وسيتم تقويم وتوصيف مصادر المقاومة هذه لذبول العدس خلال الموسم القادم.

R 5

تحديد موقع توضع مؤشر مورثة المقاومة لمرض الذبول الوعائي على الخريطة الوراثية للعدس. علاء الدين حموية¹، مايكل باوم¹ وكريستيان يونغ². (1) المركز الدولي للبحوث الزراعية في المناطق الجافة - إيكاردا، ص. ب. 5466 حلب، سورية. (2) معهد تربية النبات، جامعة كيل، كيل، ألمانيا.

يعتبر العدس (*Lens culinaris M.*) من المحاصيل البقولية المهمة وهو مصدر رئيس للبروتين وبخاصة في البلدان النامية والفقيرة. كما يعد مرض الذبول الوعائي للعدس والمتسبب عن الفطر *Fusarium oxysporum f.sp. lentis* أحد أهم الأمراض التي تسبب خسائر كبيرة لهذا المحصول. هدفت الدراسة إلى إنتاج عدد من المؤشرات الجزيئية (Molecular Markers) لاستخدامها لاحقاً كمؤشرات ترتبط بمورثات مسؤولة عن المقاومة للعديد من الأمراض، وبالتحديد لمرض الذبول الوعائي. للدراسة جزآن أحدهما نفذ في الحقل والآخر في المختبر. تكونت المادة النباتية في التجارب الحقلية من 86 سلالة نقية من الجيل الثامن الناتج عن التهجين بين أبوين أحدهما مقاوم لمرض الذبول الوعائي (ILL 5588) والآخر حساس له (L692-16-1). تم تقييم ردود أفعال هذه السلالات إزاء الكائن المرضي في الحقل والتي قدرت كنسبة مئوية للإصابة ضمن السلالة الواحدة. اعتبرت السلالات التي لم تتجاوز نسبة الإصابة 20% سلالة مقاومة وأعطيت الرمز A في حين اعطي الرمز B للسلالات الحساسة والتي تجاوزت نسبة الإصابة فيها أكثر من 20%. على المستوى المخبري وباستخدام المجموعة النباتية نفسها، تم الحصول على 278 مؤشراً جزيئياً، (110 من جزيئات الـDNA المتضاعفة عشوائياً RAPD، 129 من مؤشرات قطع التحديد المتباينة الأطوال المتضاعفة AFLP، و39 من مؤشرات التكررات البسيطة المتتابعة SSR) وتحديد مواقعها على الخريطة الوراثية للعدس. أظهرت النتائج توزيع المؤشرات الجزيئية على أربع عشرة مجموعة ارتباطية (Linkage groups). حيث جمعت 91% من المؤشرات في سبع مجموعات ارتباطية بينما توزعت المؤشرات الباقية على سبع مجموعات صغيرة. كما أظهرت النتائج بأن مورثة المقاومة لمرض الذبول الوعائي *F_w* موجودة على المجموعة الارتباطية السادسة ومحاطة بالمؤشرين *p17m30710 و SSR59-2B على بعد 3.5 و 8.0 سنتيمورغن على التوالي. وبدراسة الخريطة التشاركية (Association map) الناتجة عن الربط بين نتائج الحقل ونتائج المختبر تبين وجود ارتباط معنوي بين المورثة *F_w* المسؤولة عن المقاومة لمرض الذبول الوعائي والمؤشر SSR59-2B المتوضع على مسافة 20.8 سنتيمورغن.

R 6

طريقة محسنة للغزيلة الفاعلة للحمص لمقاومة لفحة أسكوكيتا. بسام بياعة، ماثيو أبانغ، سهام كبابي وسامر مراد، إيكاردا، ص ب 5466، حلب، سورية، البريد الإلكتروني: b.bayaa@cgiar.org

تعدّ لفحة أسكوكيتا أكثر الأمراض التي تصيب الحمص أهمية. وتعدّ مقاومة العائل حجر الزاوية لأي حزمة متكاملة لإدارة المرض. ولكي تكون الغزيلة لمقاومة لفحة فاعلة ويعتد بها، لا بد من استخدام لقاح مرضي متجانس، لذا وجب استخدام لقاح اصطناعي. وتحتاج الغزيلة الحقلية عادة كميات كبيرة من المعلق البوغي للفطر المحضر بدءاً من مستعمرات نامية على مستنبتات تركيبيّة، وهو أمر يتطلب جهداً ووقتاً وتكلفة وبخاصة لبرامج البحوث في الدول النامية. لذا فهناك حاجة لطرائق بديلة وممكنة وفاعلة لإنتاج اللقاح واستخدامه. ولهذه الغاية نفذت تجربة بتصميم القطع تحت المنشقة لتعديل طريقة الغزيلة الحالية. مثلت الأصناف (غاب 1 متوسط المقاومة و ILC 263 عالي الحساسية) القطع الرئيسية، ومثل نمط اللقاح

R 1

تأثير الفطر *Alternaria alternata* في نمو بعض أصناف الباقلاء/الفول *Vicia faba L.* أكرم حمدي قاسم و غيداء صلاح حسين، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: mhmd2agr@yahoo.com
اختبرت ثلاثة أصناف من بذور الباقلاء/الفول (التركي والسوري والاكوادلس) لدراسة الفطور المصاحبة للبذور، فأظهرت النتائج وجود 9 أجناس من الفطور كانت أكثرها تردداً *Alternaria alternata* و *Rhizctonia solani* إذ بلغت 4، 2 و 5%، و 4، 5 و 4%، وللأصناف السابقة، على التوالي. وقد اختبرت القدرة الإراضية لأربع عزلات للفطر *A. alternata* على أصناف الباقلاء/الفول الثلاثة، وتمكنت عزلات الفطر من إصابة الأصناف الثلاثة وكانت العزلة رقم 4 أكثر العزلات تأثيراً في نسبة وشدة إصابة أصناف الباقلاء/الفول، في حين كانت العزلة رقم 2 أضعفها تأثيراً. كما أوضحت النتائج وجود اختلاف معنوي بين الوزن الطري للمجموع الخضري في الأصناف المعاملة بالعزلات مقارنة بالشاهد باستثناء العزلة رقم 2 التي لم تختلف معنوياً في تأثيرها عن المقارنة في الصنفين تركي واكوادلس. وكانت العزلة 4 أكثر العزلات تثبيطاً لوزن النبات الطري، في حين لم يظهر هناك اختلاف معنوي في طول النباتات المعاملة عن المقارنة. أظهرت نتائج دراسة كمية الكلوروفيل وجود تباين معنوي بين الأصناف المعاملة بعزلات الفطر عن المقارنة.

R 2

أداء بعض أصناف الفول/الباقلء إزاء مرضي التبقع الشوكلاتي/البنّي ولفحة الأسكوكيتا. ماجد خليف الكمر، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: melkummer@yahoo.com
أجريت تجرّبه حقلية في المركز الدولي للبحوث الزراعيه في المناطق الجافة (ايكاردا) لتقييم أداء 17 سلالة عراقية من الباقلاء/الفول إزاء مرض التبقع الشوكلاتي (*Botrytis fabae*) ولفحة الأسكوكيتا (*Ascochyta fabae*) تحت ظروف العدوى الإصطناعية. أظهرت النتائج وجود فروقات عالية المعنوية بين الأصناف بالنسبة للإصابة بالمرضين، وكانت الأصناف العراقية قابلة للإصابة إلى متوسطة المقاومة للمرض. تم إجراء عدد من التهجينات بين النباتات المنتخبة من الأصناف العراقية والأصناف المقاومة لإنتاج صنف عالي الإنتاجية ومقاوم للأمراض.

R 3

رد فعل بعض أصناف الحمص المصرية والسورية للإصابة بالفطر *Fusarium oxysporum f.sp. ciceris*. فوزي عبد الظاهر خليل¹، أحمد عبد القادر عاشور¹، صلاح محمد عبد المؤمن² وإسماعيل محمود المحمد³. (1) قسم أمراض النبات، كلية الزراعة، جامعة القاهرة، مصر؛ (2) معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: salah1993@yhoo.com؛ (3) قسم وقاية النبات، كلية الزراعة، جامعة البعث، حمص، سورية، البريد الإلكتروني: ismail_path@yahoo.com

اختبر رد فعل ثمانية أصناف من الحمص ثلاثة من مصر (جيزة 1، جيزة 195، جيزة 531) وخمسة من سورية (غاب 1، غاب 2، غاب 3، غاب 4 وغاب 5) للعدوى بإحدى وعشرين عزلة مصرية من الفطر *Fusarium oxysporum f.sp. ciceris* تحت ظروف الدفيئة. واستعملت النسبة المئوية لكل من النباتات المبكرة والمتأخرة الذبول، والنباتات الباقية على قيد الحياة، كمعايير لتقييم قابلية تلك الأصناف للإصابة بالفطر المذكور. كانت الأصناف السورية أقل قابلية للإصابة من المصرية، حيث تراوحت نسبة النباتات الباقية على قيد الحياة ما بين 54.39-69.09%، في حين كانت عند الأصناف المصرية 50.75-59.03%. أظهر تحليل التباين أن الأصناف والعزلات وتفاعل الأصناف مع العزلات كلها مصادر عالية المعنوية للتباين في جميع المعايير موضع الدراسة. وتبين أيضاً، أن هناك أكثر من سلالة بين عزلات الفطر، وإن مقاومة أصناف الحمص للفطر هي خليط من المقاومة الرأسية والأفقية. وعلى نحو مماثل، فإن القدرة الإراضية لعزلات الفطر هي خليط من القدرة الإراضية المتخصصة وغير المتخصصة. أمكن باستخدام التحليل العنقودي تقسيم العزلات إلى ثلاث مجاميع، و لم يكن هناك أي صلة تربط بين هذه المجاميع من حيث الموقع الجغرافي، وكذلك تبين من خلال التحليل العنقودي لعلاقة الأصناف فيما بين بعضها البعض أن هنالك نسبة تجانس عالية بين معظم الأصناف السورية في حين كانت الأصناف المصرية غير متجانسة.

R 4

تقويم المقاومة لمرض ذبول العدس الوعائي في العدس كبير الحبة. بسام بياعة¹، أنثوش ساركر¹، ماثيو أبانغ¹، عمار بياعة²، سامر مراد¹، سهام كبابي¹، حسن الحسن¹ وعلي اسماعيل¹. (1) المركز الدولي للبحوث الزراعية في المناطق الجافة، ايكاردا. ص ب 5466 حلب، سورية، البريد الإلكتروني b.bayaa@cgiar.org؛ (2) كلية الزراعة، جامعة حلب، سورية.
يعدّ الذبول الوعائي للعدس الذي يحدثه الفطر *Fusarium oxysporum f.sp. lentis* Schlecht em. Snyder & Hansen مرضاً مهماً في إنتاج العدس على المستوى العالمي. وكانت مقاومة العائل النباتي، حتى الآن، الوسيلة الأكثر عملية

**مقاومة النبات
للآفات**

التام للخلية 25 دقيقة في يرقات الدعسوقة، بينما كانت تلك الفترة في يرقات كل من السيرفد وأسد المن 30 و40 دقيقة، على التوالي.

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دراسة مورفولوجية وحياتية لأبي العيد *Psyllobora bisoconotata* Mul. المتغذي على فطريات البياض الدقيقي. غيداء يونس¹، محمد أحمد² ونوال علي¹. (1) قسم النبات، كلية العلوم، جامعة تشرين، اللاذقية، سورية؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: abboudrafeek@hotmail.com

تنتشر حشرة أبو العيد *Psyllobora bisoconotata* Mul. (Coleoptera : Coccinellidae) في كافة مناطق الساحل السوري، متغذية في طورها اليرقي والكامل على فطريات البياض الدقيقي التي تصيب العديد من النباتات البرية والمزروعة (عشبية، محاصيل حقليّة، أشجار فاكهة وغابات). تظهر هذه الحشرة عادة في بداية نيسان على الكثير من العوائل النباتية، حيث سجل توأجدها على 56 نوعاً نباتياً يتبع لـ 23 فصيلة نباتية، ويستمر نشاطها حتى أواخر تشرين الثاني/نوفمبر. تُرست الحشرة من الناحية الشكلية/المورفولوجية والبيولوجية تحت ظروف المختبر (عند درجة حرارة 25 ± 2 °س، ورطوبة نسبية $5 \pm 70\%$ ، 8:16 ساعة (إضاءة: ظلام) بتغذيتها على فطر البياض الدقيقي *Erysiphe cichoracearum* على أوراق نبات *Picris*، وعلى فطري *Erysiphe cichoracearum* و *Sphaerotheca fuliginea* على أوراق اليامياء والكوسا. بلغت المدة الكلية للتطور من البيضة إلى الحشرة الكاملة 2.08 ± 24.1 يوماً، عند تربيتها على النوع *E. cichoracearum* على أوراق الـ *Picris*، بينما انخفضت إلى 1.52 ± 18.4 يوماً بتربيتها على النوعين *E. cichoracearum* و *S. fuliginea* على أوراق الكوسا. تم قياس الأبعاد المختلفة للحشرة بطورها اليرقي والكامل، بالإضافة إلى تحديد أوزان كل من تلك الأطوار. بلغ متوسط مدة الحياة 46.24 ± 72.6 يوماً للأنثى و 19.65 ± 47.25 يوماً للذكر على اليامياء. بلغ متوسط الخصوبة الكلية للأنثى 81.96 ± 124 بيضة/أنثى على أوراق نبات *Picris*، 37.45 ± 62.45 بيضة/أنثى على أوراق الكوسا، في حين انخفضت إلى 18.39 ± 44.81 بيضة/أنثى على أوراق اليامياء.

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نوعان من الحلم الأكاريدي *Mycetoglyphus qassimi* و *Tyrophagus putrescentiae* في مزارع نخيل التمر يتغذيان على نيماتودا تعقد الجذور *Meloidogyne javanica* في القصيم - المملكة العربية السعودية. سليمان الرحيانى وأحمد فولى، قسم إنتاج النبات ووقايته، كلية الزراعة والطب البيطري، جامعة القصيم، بريدة، ص.ب. 1482، المملكة العربية السعودية، البريد الإلكتروني: alreh@yahoo.com

تم حصر النوعان *Mycetoglyphus qassimi* و *Tyrophagus putrescentiae* وهما من مجموعة الحلم الأكاريدي عديم الثغور التنفسية، في منطقة المجموع الجذري لأشجار نخيل التمر في منطقة القصيم. تمت دراسة تاريخ حياة كلا النوعين بالتفصيل تحت ظروف المختبر (27 °س ورطوبة 70%) وذلك بتغذيتهما على ثلاثة أنواع من الغذاء هي حبوب لقاح نخيل التمر والفطر *Aspergillus niger* وكتل بيض نيماتودا تعقد الجذور *M. javanica* (والتي تعتبر من أهم مسببات الأمراض التي تصيب نباتات الخضر وكافة المحاصيل الزراعية الهامة) وذلك لأول مرة في منطقة القصيم. نجح نوعا الحلم في إكمال حياتهما بالتغذية على أنواع الغذاء الثلاثة حيث لوحظ أن التغذية على كتل بيض نيماتودا تعقد الجذور أدت إلى تنشيط وإسراع النمو. كما لوحظ وجود بعض أطوار الحورية الثانية (الهيوبوس) في النوع الأول، وأن الأطوار غير الكاملة لذكور كلا النوعين وصلت إلى الطور البالغ قبل إبنائها، عاشت الذكور البالغة لفترة أقصر من الإناث. ولوحظت طريقة تغذية نوعي الحلم الأكاريدي على كتل بيض النيماتودا إذ تقترب كل الأطوار الكاملة وغير الكاملة من كتلة البيض وتبدأ في تحريك ثم غرز الزوائد الملقطية في السطح العلوي المغلف لكتلة البيض، وتستمر في دفع مقدمة أجسامها للداخل حتى تصبح منطقة الرأس الكاذب (الجانثوسوما) بكاملها داخل كتلة بيض النيماتودا وتبدأ في إمتصاص محتواها. كانت النسبة الجنسية للإناث في النوع *M. qassimi* هي 53%، 54% و 52% بينما كانت 57%، 54% و 56% للنوع *T. putrescentiae* عند التغذية على بيض النيماتودا وحبوب لقاح النخيل والفطر على التوالي. تم إدراج واستخدام النسبة الجنسية في حساب جداول حياة كلا النوعين. وتأثرت مدة متوسط الجيل (T) معنوياً بنوع الغذاء حيث كانت مدة الجيل هي الأقصر عند التغذية على كتل بيض النيماتودا تلاها التغذية على حبوب اللقاح ثم الفطر. كما أوضحت النتائج بصورة واضحة أن التغذية على كتل بيض نيماتودا تعقد الجذور كانت هي الأنسب حيث أعطت أعلى معدلات الخصوبة ووضع البيض (R_0) في النوع *M. qassimi* بينما كانت هذه الأفضلية لحبوب لقاح النخيل بالنسبة للنوع *T. putrescentiae* كما هو موضح في جداول حياة كلا النوعين. كما وصل معدل تضاعف النوع (r^m) إلى أعلى معدلاته في النوعين عند التغذية على بيض نيماتودا تعقد الجذور. وكانت النتيجة بالمثل بالنسبة لمعدل التزايد النوعي اليومي (e^m). أوضحت نتائج التربية جداول الحياة أن النوع *M. qassimi* يمكن أن يلعب دوراً هاماً كعدو حيوي في برنامج مكافحة جيد ضد نيماتودا تعقد الجذور *M. javanica* وخاصة في البيوت المحمية.

أظهرت النتائج تأثير المدة التي تعيشها حشرة البق المفترس كحشرة ناضجة ومعدل خصوبتها بنوع العائل النباتي للفريسة (الذبابة البيضاء)، فكانت أعلى عندما قدمت الذبابة البيضاء للبق المفترس على أوراق البندورة منها على أوراق الباذنجان. وكان معدل الوفيات في حشرة البق المفترس خلال فترة تطورها أعلى على محصول الباذنجان منها على محصول البندورة، وبذلك فقد تطابق منحنى البقاء لحشرة البق مع النمط الثاني من أنماط البقاء للحشرات عندما قدمت الذبابة البيضاء كغذاء للبق المفترس على محصول البندورة في حين تطابق المنحنى مع النمط الثالث عندما قدمت الذبابة البيضاء كغذاء للبق المفترس على أوراق الباذنجان. ويمكن الاستنتاج أن حشرات البق المفترس اكملت دورة حياتها وعاشت كحشرات ناضجة لفترة مناسبة وأنتجت جيلا جديدا عندما تم تغذيتها على بيوض ويرقات الذبابة البيضاء المقدمة على كل من أوراق البندورة والباذنجان. وأخيرا يمكن التوصية بضرورة إجراء أبحاث حقلية حول إمكانية استخدام حشرة البق المفترس للسيطرة على حشرة الذبابة البيضاء على كل من البندورة/الطماطم والباذنجان.

NE 31

حصر لأهم أنواع حافرات الأنفاق (Diptera: Agromyzidae)، الأعداء الحيوية والمضيفات النباتية لتلك الأنواع. رسمية المعلم وهناك أسعد، الهيئة العامة للبحوث العلمية الزراعية، ص.ب 113، دوما، دمشق، سورية، البريد الإلكتروني: arasmia@scs-net.org

تعَد حافرات الأنفاق من فصيلة Agromyzidae: Diptera من الآفات المهمة التي تهاجم العديد من أنواع الخضار والمحاصيل ونباتات الزينة في البيوت المحمية وفي الحقل المفتوح في سورية. خلال الفترة ما بين 2000-2001 تم إجراء حصر لأهم أنواع حافرات الأنفاق وأعدائها الحيوية في البيئة المحلية وشمل مختلف مناطق القطر باستثناء المنطقة الشمالية الشرقية. تبين من خلال هذا الحصر وجود أنواع عديدة تم تصنيف ثلاثة منها هي: (*Chromatomyia horticola* (Goureau)، *Liriomyza huidobrensis* (Blanchard) و *Liriomyza trifolii* (Burgess). لوحظ أن النوع *Ch. horticola* هو الأكثر انتشارا حيث سجل على 49 مضيفا نباتيا إلا أن أضراره محدودة نظرا لانخفاض عدد أجياله ونشاط الأعداء الحيوية المرافقة له والتي تكبح تطور مجتمع هذه الآفة وتبقيها دون مستوى الضرر. أما النوع *L. huidobrensis* فقد سجل على 34 مضيفا نباتيا وهو يسبب أضرارا كبيرة على الخضراوات ونباتات الزينة خاصة في البيوت المحمية، في حين مازال النوع *L. trifolii* محدود الانتشار. والنوعان الأخيران من الأنواع غير المستوطنة ويرجح دخولهما إلى القطر عن طريق شتول نباتات الزينة المستوردة. سجل خلال الحصر عشرة أنواع من الطفيليات، هي: *D. poppoea* Walker، *Diglyphus isaea* Walker، *Chrysochris Ainsliei*، *Chrysonotomyia lyonetae* Ferriere، *Pediobius acantha* Walker، *D. minoens* Walker، *Crawford*، *Neochrysochris Formosa* Westwood، *Opius* sp.، *Halticoptera* sp.، *Hemiptarsenus* sp. وثلاثة أنواع من المفترسات، هي: *Coenosia attenuata* Stein، *Crossopalpus* sp. و *Platypalpus* sp. لوحظ أن الطفيل *D. isaea* هو أهم هذه الأنواع وأكثرها انتشارا لذلك ينبغي التركيز على دراسته بهدف تربيته وإدخاله في برامج مكافحة المتكاملة لحافرات الأنفاق.

NE 32

تربية مخبرية لأسد المن على نبات التبغ. فداء شمسين، نبيل أبو كف وماهر المصري، المؤسسة العامة للتبغ، دائرة الأبحاث في جب حسن، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: kaisgazal@shufbc.com
تمت تنفيذ تجربة مخبرية خلال عام 2005 في مختبر مكافحة الحيوية في دائرة الأبحاث في جب حسن التابع للمؤسسة العامة للتبغ عند درجة حرارة بين 24-29°س ورطوبة نسبية 65±5% لدراسة دورة حياة أسد المن (*Chisopaerla carnea*) من البيضة إلى الحشرة الكاملة. أظهرت النتائج أن دورة الحياة بلغت 23-29 يوم، حيث فقست البيوض بعد 4-5 أيام وكانت مدة الأطوار اليرقية 12.5 يوما ومرحلة العزراء من 9-12 يوم، أما فترة حياة الحشرة الكاملة فتراوحت بين 47-51 يوما. استهلكت الأطوار اليرقية 149 حورية من حشرات من الدراق الأخضر *Myzus persicae*، ودرست الخصوبة الأنثى وكان معدل ما تضعه من البيوض 544 بيضة طيلة حياتها.

NE 33

توزيع نظام تجلط الدم في بعض المفترسات الحشرية. طلال طاهر محمود، كلية الزراعة، جامعة دهوك، العراق، البريد الإلكتروني: taherm47@yahoo.com

نفذت هذه الدراسة لاجاد نظام تجلط الدم المفترسات، السيرفد والدعسوقة 7 نقطة وأسد المن ولأول مرة. في يرقات السيرفد وجد نظيرين من الخلايا المتجلطة، الأولى الشفافة والصغيرة الداكنة والتي تشارك في تجلط دمها. وجد في نوعي المفترسات الأخرى أن خلية التجلط الصغيرة الداكنة سببت في رد فعل البلازما وعمليات التجلط. بلغت الفترة الكلية للتجلط

NE 28

تأثير أنواع الأسمدة في أعداد الفريستين من الخوخ الأخضر (*Myzus persicae* Sulz.) والذبابة البيضاء (*Bemisia tabaci* Genn.) والمفترسين الدعسوقة ذات النقاط السبع (*Coccinella septempunctata* L.) والدعسوقة ذات الأحد عشر نقطة (*C. undecimpunctata* L.) وفي الصفات النباتية والإنتاجية للبطاطا/للبطاطس. سهل كوكب الجميل وسعاد أرديني عبد الله، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com

أظهرت الدراسة أن لنوع السماد تأثيراً عالي المعنوية في متوسط أعداد الفريستين (من الدراق الأخضر *Myzus persicae* والذبابة البيضاء *Bemisia tabaci*) والمفترسين (*Coccinella septempunctata* و *C. undecimpunctata*) وفي الصفات النباتية والإنتاجية للبطاطا/للبطاطس (وزن الدرنة، حاصل النبات الواحد ثم الحاصل الكلي) للموسم 2003 في منطقتي الدندان والرشيديّة، فيما عدا صفة ارتفاع النبات حيث كان التأثير معنوياً. وظهر أن المعاملة السمادية المكونة من 86.5 كغ أزوت/دوّم، 20 كغ/دوّم سماد بوتاسي و 3 غ/ليتر سماد ورقي كانت الأفضل من حيث أعلى متوسط لأعداد الفريستين (من الخوخ الأخضر والذبابة البيضاء) والمفترسات من الدعاسيق في منطقة الدندان. كذلك أعطت المعاملة السمادية نفسها أفضل الصفات النباتية والإنتاجية من ارتفاع النبات، عدد الدرّات، حاصل النبات الواحد والحاصل الكلي في منطقة الدندان مقارنة بمنطقة الرشيديّة، وبلغت 131.33 سم، 18 درنة/نبات، 1313.20 غ و 14.10 طن/دوّم، على التوالي.

NE 29

دراسة أولية للأعداء الطبيعية لمن تجعد أوراق اللوز (*Brachycaudus amygdalinus* (Schout.) في جبل العرب، جنوبي سورية. وائل المتني¹ ونذير خليل². (1) قسم إدارة الآفات، مديرية وقاية النبات، وزارة الزراعة، دمشق، سورية البريد الإلكتروني: almatni@scs-net.org؛ (2) قسم البيولوجية الحيوانية، كلية العلوم، جامعة دمشق، دمشق، سورية. عُرّفت أنواع المن التي تصيب أشجار اللوز والدراق في جبل العرب (محافظة السويداء، جنوب سورية) خلال أشهر الربيع والصيف خلال الفترة ما بين 2002-2006. اعتبرت ثلاثة أنواع آفات اقتصادية على الشجرتين المدروستين منها النوعان من تجعد أوراق اللوز *Brachycaudus amygdalinus* و *B. helichrysi* (Aphididae: Homoptera) اللذان يهاجمان الأوراق الفتية ويسببان إتلافها وتقزمها، ونوع يهاجم القلف ويفرز ندوة عسلية غزيرة هو *Pterochloroides persicae*. أجري مسح للأعداء الطبيعية لحشرات من تجعد أوراق اللوز في هذه المنطقة ودرست تغيرات كثافتها وأنواعها من شهر نيسان/أبريل وحتى نهاية آب/أغسطس في الأعوام 2002، 2003 و 2004. تم تسجيل 30 نوعاً من الأعداء الطبيعيين الحشريون تتبع 5 رتب حشرية هي غمديات الأجنحة Coleoptera ونصفيات الأجنحة Heteroptera وثنائيات الأجنحة Diptera وغشائيات الأجنحة Hymenoptera. تضم هذه الأعداء الحيوية خمسة عشر نوعاً من Coccinellidae وأربعة أنواع من كل من Anthocoridae و Miridae وثلاثة أنواع من Syrphidae ونوع واحد لكل من Chrysopidae و Chamaemyiidae وخنفساء رواعه، إضافة إلى منطفل وحيد من فصيلة Aphididae. لوحظت مجموعة من العناكب أيضاً (Arachnid) تقترب من المن. كان أكثر مفترسات المن وفرة وأهمها في بداية الموسم هم أبو العيد ذو النقاط السبعة *Coccinella septempunctata*، تلاه النوعان *Scymnus (Pullus) subvillosus* و *Hyppodamia variegata*. أما أنواع البق المفترس فكان أكثرها عدداً *Orius horvathi*.

NE 30

دراسة مخبرية حول علاقة الافتراس ما بين البق المفترس (*Orius laevigatus*) وذبابة التبغ البيضاء (*Bemisia tabaci*). إياد طالب محمد أبو عوض وعبد الجليل حمدان، كلية الزراعة، جامعة الخليل، الخليل، ص.ب. 40، الضفة الغربية، فلسطين، البريد الإلكتروني: ajhamdan@hebron.edu.

تم تنفيذ الدراسة الحالية والتي شملت فحوصات مخبرية حول إمكانية استعمال البق المفترس (*Orius laevigatus*) كعدو حيوي ضد ذبابة التبغ البيضاء (*Bemisia tabaci*) وذلك على كل من نباتات البندورة/الطماطم والباذنجان، تحت ظروف مناخية مستمرة عند درجة حرارة 25 ± 1 °س، ورطوبة نسبية $75 \pm 5\%$ و 16 ساعة إضاءة. أظهرت النتائج أن كلا من الحوريات والحشرات الناضجة للبق المفترس تمكنت من التغذية على بيوض ويرقات الذبابة البيضاء عندما عرضت على أوراق نباتات البندورة/الطماطم والباذنجان، وفضلت حشرات البق التغذية على بيوض الذبابة البيضاء أكثر من التغذية على يرقاتها. تمكنت حوريات البق المفترس من افتراس ما معدله 364.68 بيضة و/أو يرقة الذبابة البيضاء المقدمة على أقراص أوراق البندورة/الطماطم في حين تمكنت من افتراس 283.46 بيضة و/أو يرقة الذبابة البيضاء المقدمة على أوراق الباذنجان. وتمكنت حشرات الإناث الناضجة للبق المفترس من افتراس ما معدله 883 بيضة و/أو يرقة الذبابة البيضاء المقدمة على أوراق البندورة، في حين تمكنت من افتراس ما معدله 455 بيض و/أو يرقة الذبابة البيضاء المقدمة على أوراق الباذنجان.

أعداد المفترس ذروتها خلال الأسبوع الثاني من شهر تشرين الأول/أكتوبر عندما كانت درجة الحرارة العظمى 34 °س والصغرى 27 °س والرطوبة النسبية 44%. كما بينت الدراسة توافق ذروة المفترس مع ذروة بيض دودة جوز القطن الشوكية *Earias insulana* مما يؤهله كعامل حيوي مهم ومحدد لبيض الحشرة.

NE 25

حصر أولي للأعداء الحيوية للحشرات والأكاروسات على البندورة/الطماطم في الزراعات المحمية في الساحل السوري. محمد أحمد، قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية.
أجريت الدراسة خلال موسمي 2005/2004 و 2006/2005، وتم خلالها تحديد الأعداء الحيوية الطبيعية (طفيليات ومفترسات) المرافقة للآفات الحشرية والأكاروسية التي غزت البندورة المحمية/الطماطم في تلك الفترة، وقد تم تحديد الظهور الطبيعي داخل الدفيئة البلاستيكية للأعداء الحيوية التالية: *Encarsia formosa* و *Eretmocerus mundus* (Hymenoptera: Aphelinidae)، *Stethorus gilvifrons* (Coleoptera: Coccinellidae)، *Aphidletes* (Thripidae) *Scolothrips sexmaculatus* (Diptera: Cecidomyiidae)، *Feltiella acarisuga* (Hymenoptera: Eulophidae)، *Diglyphus isaea* (Hemiptera: Miridae)، *Dicyphus* sp. (Thysanoptera: Praon sp. (Hymenoptera: Eulophidae)، *Euplectrus* sp. (Hymenoptera: Ichneumonidae)، *Hyposoter* sp. (Hymenoptera: Aphidiidae). كما تم تحديد تغيرات كثافة بعض هذه الأعداء الطبيعية. والدراسة مستمرة لتحديد الكفاءة الطبيعية لكل من الأعداء الحيوية من أجل اختيار الأكفا في مكافحة الحيوية التطبيقية.

NE 26

إحصاء ودراسة الحشرات المفيدة ضد حافرة أنفاق أوراق الحمضيات (*Phyllocnistis citrella* Stainton) في الناحية الغربية للجزائر. مليكة بوعلام وأ. بركاني، مختبر وقاية النبات، جامعة مستغانم، ص.ب. 300، مستغانم، الجزائر 2700، البريد الإلكتروني: boualemmalika@yahoo.fr، laboratory-pv@univ-mosta.dz
تعدّ مكافحة الحيوية من بين الطرائق والوسائل الأكثر فاعلية لتنظيم مجموعات حافرة أنفاق أوراق الحمضيات (*P. citrella*) (Lepidoptera: Gracillariidae). تم لمدة سنتين متتاليتين على مستوى حقول الحمضيات في منطقة مستغانم والمحمية أخذ عينات أسبوعية لمئة ورقة من شجرة برتقال مصابة، أجريت لكل موقع بحث. أوضحت النتائج عن وجود الأنواع المحلية التالية من الأعداء الحيوية: *Chrysocharis* sp.، *Cirrospilus vittatus*، *Cirrospilus pictus*، *Pnigalio mediterraneus* و *Sympiesis gregorie*. وقد أظهر النوع *P. mediterraneus* وجودا منتظما خلال سنتي البحث بتكرار جيد، خاصة خلال الأشهر الأكثر حرارة. بينت الملاحظات تأقلم النوع المدخل *Semielacher petiolatus*، وأظهرت النتائج أيضا أن المرحلة اليرقية الثالثة ومرحلة العذراء لحافرة أنفاق أوراق الحمضيات هي الأكثر تعرضا لنشاط الحشرات المفيدة.

NE 27

دراسة نسب الإصابة للحشرات القشرية *Parlatoria pergandii* Comstock، *Lepidosaphes beckii* Newman، *Aonidiella aurantii* Maskell وأعدائها الحيوية في الساحل السوري. قيس غزال، مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، مديرية زراعة اللاذقية، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: Kaisgazal@shufbc.com
تعدّ الحشرات القشرية المدرعة من الآفات الرئيسية التي تصيب الحمضيات في سورية، ومن أنواعها المهمة في سورية *A. aurantii*، *L. beckii* و *P. pergandii*. بلغت نسبة تواجد الأنواع الثلاثة على ثمار الحمضيات في موسم 2005/2004 في سبعة مواقع: *P. pergandii* (72.02%)، *A. aurantii* (17.94%) و *L. beckii* (10.02%). في بلغت نسبة الأنواع الثلاثة في موسم 2006/2005 في المواقع نفسها 73.62، 18.42 و 7.94%، على التوالي. سجلت ثلاثة أنواع من الطفيليات *Aphytis* spp.، *Encarsia* spp. و طفيل آخر غير معروف على حشرة *P. pergandii*، وأربعة طفيليات على حشرة *A. aurantii*، والطفيليات الأربعة التالية: *Aphytis* spp.، *Encarsia* spp.، *Marietta picta*، طفيل رابع غير معروف على حشرة *L. beckii*. كما سجلت المفترسات التالية على الحشرات الثلاث: *Chilocorus bipustulatus* Linnaeus، *Rhizobius* spp.، والمفترس الأخير من العناكب وهو يفترس البيوض ولكنه كان نادر الوجود خلال فترة الدراسة.

الصوفي في بداية شهر تشرين الثاني/نوفمبر بنسبة وصلت أقصاها إلى 72.3، 87.3 و 95.5% في عام 2004، و 77.1، 90.1 و 96% في عام 2005، على التوالي. ومن النتائج السابقة يمكن استخدام مفترس أبو العيد ذو السبع نقاط بنجاح كأحد عناصر مكافحة البيولوجية كما يعتبر عنصراً فعالاً في برامج مكافحة المتكاملة لمن التفاح الصوفي علي أشجار التفاح.

NE 22

إختبار مدى إستجابة البنية الوراثية للمفترس أبو العيد ذو السبع نقاط لعملية التحسين الوراثي باستخدام طريقة التزاوج الخلطي العشوائي. لؤي أصلان¹ وناديا الخطيب². (1) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، دمشق، سورية، البريد الإلكتروني: louai@arabscientist.org؛ (2) مديرية الزراعة والإصلاح الزراعي باللاذقية، مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، ص.ب 2012، اللاذقية، سورية، البريد الإلكتروني: nadia@arabscientist.org

تمت تربية وإكثار المفترس *Coccinella septempunctata* بطريقة التزاوج للانتقال من السلالة المحلية الطبيعية إلى السلالة المخبرية بهدف الإستمرار في إنتاج واحتواء مجاميع المفترس والمحافظة على القيم العددية لأهم مؤشرات المورفولوجية والبيولوجية. أجري البحث على سلالات المفترس المحلية التي تم جمعها من البيئة الزراعية في الساحل السوري، حيث أثبتت نتائج ثابتة وإستقرار البنية الوراثية لهذه السلالات على مدى ثلاثة أجيال، إذ كانت جميع الفروق الإحصائية ظاهرة وذلك على مستوى ثقة 5%. كما أثبتت نتائج البحث إستجابة هذه السلالات للطريقة السابقة في التربية وذلك على النحو التالي: (1) ارتفعت الخصوبة من 20.8±98.2 في جيل الآباء (P0) إلى 20.3±105.6 في جيل الأحفاد F2 وكانت إستجابة هذا المؤشر للتزاوج الخلطي 7.5%. (2) ارتفعت المقدرة الإفتراضية لليرقات من 2.87±88.8 في جيل الآباء إلى 12.31±94.8 في جيل الأحفاد F2 وكانت الإستجابة للطريقة السابقة 6.8%. كذلك ارتفعت قيم جميع المؤشرات البيولوجية الأخرى (مدة التطور، مؤشر التكاثر، مؤشر استمرارية الحياة وازدياد طول جسم الإناث).

NE 23

فعالية المفترس *Serangium parcesetosum* Sicard في السيطرة على ذبابة القطن البيضاء *Bemisia tabaci* Genn. رفيف عبود¹، محمد أحمد² ونيل أبو كف². (1) مركز البحوث العلمية الزراعية باللاذقية، هيئة البحوث العلمية الزراعية، سورية، البريد الإلكتروني: abboudrafeek@hotmail.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية.

أجريت دراسة على المفترس *Serangium parcesetosum* (Coleoptera: Coccinellidae)، استخدمت فيها ذبابة القطن البيضاء *Bemisia tabaci* (Homoptera: Aleyrodidae) كفريسة. هدفت الدراسة إلى معرفة زمن إستهلاك الفريسة وتأثير النبات العائل للفريسة في بعض الخصائص الحياتية للمفترس. كما أجريت دراسة لتحديد معدلات الإطلاق اللازمة للسيطرة على ذبابة القطن البيضاء على نباتات بادنجان ضمن الأقفاص. أدخلت الحشرات الكاملة للمفترس على نباتات البادنجان المصابة بذبابة القطن البيضاء بمعدل 0، 3 و 6 بالغة/ نبات على ثلاث دفعات بفواصل أسبوع بين كل إدخال والذي يليه. بلغ زمن التطور عند درجة حرارة 27^oس منذ وضع البيض حتى انبثاق الحشرة الكاملة 15.9 و 16.5 يوماً على كل من الخيار والبندورة/الطماطم، على التوالي، ولكن لم تستطع يرقات المفترس البقاء على قيد الحياة على أوراق نبات التبغ. ازداد زمن استهلاك الفريسة مع تقدم طور الذبابة البيضاء من 125.9 ثانية للبيضة إلى 53.1 دقيقة للعمر الرابع. تناقص زمن الإستهلاك مع تقدم المفترس بالعمر، إذ احتاج العمر اليرقي الأول إلى 125.9 ثانية لإستهلاك البيضة بينما احتاج العمر اليرقي الرابع إلى 13.4 ثانية فقط. زادت أعداد أطوار الذبابة البيضاء في المعاملات التي أدخل إليها المفترس حتى الأسبوع الثالث، ثم بدأت بالإنخفاض من حوالي 12 طور غير كامل/1 سم² من الورقة إلى 0.4 بعد سبعة أسابيع. بينما زادت كثافة مجتمعاتها إلى ثلاثة أضعاف في معاملة الشاهد خلال ذات الفترة. بلغت كثافة يرقات الخنفساء نروتها في الأسبوع الخامس 3.9±6.6 في المعاملة الأولى التي أطلق فيها 3 بالغة/ نبات، و 7.4±16.6 يرقة/ نبات في المعاملة الثانية التي أطلق فيها 6 بالغة/ نبات. وبلغ تعداد بالغات المفترس الذروة 1.8±14.1 و 0.8±8.3 بالغة/ نبات في نهاية الأسبوع السابع في المعاملتين الأولى والثانية، على التوالي.

NE 24

مسوحات أولية للتواجد الموسمي للمفترس *Orius albidipennis* في حقول القطن وسط العراق. أمال سلمان عبد الرزاق، نزار نومان حمه، نداء سعود عبد وأحمد عطية عافي، الهيئة العامة للبحوث الزراعية، وزارة الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: amal2004s2000@yahoo.com

أشارت نتائج المسوحات الحقلية إلى أن تواجده المفترس *Orius albidipennis* (Hemiptera: Anthocoridae) في عام 2003 شكل نسبة 26.12% من المجموع الكلي للأعداء الحياتية في حين بلغت النسبة 36% للعام 2004. وقد وصلت

NE 18

قائمة بالطفيليات الثانوية للحشرات القشرية في مصر. شعبان عبد ربه، معهد بحوث وقاية النباتات، مركز البحوث الزراعي، 7 شارع نادى الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: shaaban59@yahoo.com
نفذ مسح للطفيليات الثانوية للحشرات القشرية في مصر خلال الفترة 2004-2005. وتم تعريف 10 أنواع من الطفيليات الثانوية (*Ablerus atomon* (Walker)، *Ablerus chionaspidis* Howard، *Ablerus clisiocampae* (Ashmead)، *Marietta*، *Chartocerus niger* (Ashmead)، *Chartocerus subaeneus* (Foerster)، *Ablerus perspicuosus* (Girault)، *Signiphora flavella* Girault و *Marietta picta* (Andre)، *Marietta leopardina* Motschulsky، *carnesi* (Howard)) ستة أنواع منها تسجل لأول مرة في مصر من خلال هذا العمل.

NE 19

دور الأعداء الحيوية في تنظيم تعداد حشرات من النجيليات التي تصيب القمح تحت ظروف مصر العليا - مصر. محمد علاء الدين أحمد عبد الرحمن، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، مصر، البريد الإلكتروني: alaaa4@hotmail.com

تعتبر النتائج التي يحتوي عليها البحث ملخصاً لخمس سنوات من الدراسة (من 2001 حتى 2005) وذلك بهدف معرفة الدور الطبيعي لعناصر مكافحة الحيوية في تنظيم تعداد حشرات من النجيليات بصعيد مصر. وجد أن هناك نوعين من حشرات من النجيليات تعتبر من أهم الأنواع وهم حشرات البق الأخضر وحشرات من الشوفان. ووجد أن كلا أنواع حشرات من النجيليات تتواجد على نفس أجزاء النبات مجتمعة. تعتبر المفترسات من عوامل مكافحة الحيوية وتم تصنيف خمسة أنواع من المفترسات الهامة في حقول القمح بالإضافة إلى بعض أنواع من العناكب الحقيقية. أما الطفيليات الحشرية فقد تم تعريف 7 أنواع من الطفيليات الأولية منها بالإضافة إلى نوع من الطفيليات الثانوية. وجد أن كل من الطفيل *Diaeretiella rapae* و *M'Intosh* وكذا الطفيل *P. necans* تعتبر من أهم الطفيليات وذلك لزيادة قيم السيادة والوفرة لهذه الطفيليات. وبخصوص المسببات المرضية الفطرية فقد تم تصنيف اثني عشرة نوعاً منها. ووجد أن حشرات من النجيليات تبدأ في إصابة نباتات القمح مع نهاية شهر كانون الأول/ديسمبر ويستمر زيادة تعداد حشرات المن في الزيادة التدريجية حتى يصل إلى أعلى تعداد مع نهاية شهر شباط/فبراير وأوائل شهر آذار/مارس ثم بعد ذلك يقل التعداد مع نهاية شهر آذار/مارس. والدور الطبيعي لجميع عناصر مكافحة الحيوية تحت الظروف الحقلية تم تحديده وقياسه.

NE 20

الأعداء الحيوية لحشرة أم سيجارة (*Auchmophila kordofensis* Rebel) ودورها في التحكم الطبيعي فيها. محمد النذير الفاضل محمود، أحمد حسن محمد وموسى عبد الله أحمد، مركز بحوث وقاية المحاصيل، هيئة البحوث الزراعية، ص.ب. 126، ودمدني، السودان، البريد الإلكتروني: nazeiro@maktoob.com

تعد حشرة أم سيجارة (*Auchmophila kordofensis* Rebel) من أهم معريات أوراق الشوكيات وخاصة أشجار اللعوت (*Acacia nubica*) والسيال (*Acacia tortilis*). أجريت هذه الدراسة بشمال كردفان، السودان خلال عام 2004 لتحديد الأعداء الحيوية لحشرة أم سيجارة وتقويم دورها في التحكم فيها. عزلت ثمانية متطفلات تم تحديد خمسة منها وهي: *Tachina ebneri*، نوعين من *Eurytoma* spp.، *Goryphus nursei* و *Brachymeria* sp.، ولم يتم تحديد ثلاثة منها. أوضحت الدراسة أن *Tachina ebneri* و *Eurytoma* spp. هما الأكثر تواجداً وتطفلاً حيث بلغت نسبة تطفلها 24.5%، وبلغت نسبة افتراس النمل 23% لاسيما النوعين *Messor galla* و *Catalyphus bicolor*. كما تم عزل بعض العناكب لم يتم تعريفها.

NE 21

تقييم كفاءة أبو العيد ذو السبع نقاط (*Coccinella septempunctata*) في خفض أعداد من التفاح الصوفي (*Eriosoma lanigerum*) على أشجار التفاح. أشرف عبد السلام هندي منجود، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الدقي، الجيزة، مصر، البريد الإلكتروني: ashrafhendy2001@yahoo.com

يعتبر من التفاح الصوفي من أكثر الآفات إصابة لأشجار التفاح خاصة الأشجار المطعمة على الأصل 'بلدي' في مصر. يرتبط هذا النوع من المن بمفترس قوي هو أبو العيد ذو السبع نقاط *Coccinella septempunctata* (Coleoptera: Coccinellidae). أجري هذا البحث لتقييم معدلات مختلفة من الحشرة النافعة في خفض أعداد من التفاح الصوفي (*Eriosoma lanigerum*) (Homoptera: Aphididae) على أشجار التفاح بمحافظة القليوبية خلال موسمين متتاليين (2004 و 2005). أدى إطلاق هذا المفترس بمستوى 30، 60 و 90 بيضة/شجرة إلى خفض نسبة الإصابة بمن التفاح

الإناث مع انخفاض درجات الحرارة حيث عمرت الأنثى 25.3 يوماً عند درجة حرارة 20 °س، في حين لم تتجاوز تلك المدة 17.8 عند درجة حرارة 26 °س. أشارت هذه النتائج إلى وجود تأثير معنوي لدرجة الحرارة في خصوبة الأنثى وطول فترة بقائها.

NE 16

دراسة حياتية/حيوية للمتطفل (*Aphelinus gossypii* (Timberlake) عند ثلاث درجات حرارة مختلفة. ليلى عبد الوهاب ارشيد¹ وثابت علاوي². (1) قسم التقنيات الحيوية، كلية الزراعة التكنولوجية، جامعة البلقاء التطبيقية، السلط، الأردن، البريد الإلكتروني: leena@bau.edu.jo؛ (2) قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن.

يعد المتطفل (*Aphelinus gossypii* (Timberlake) (Hymenoptera: Aphelinidae) واحداً من أهم المتطفلات على حشرات من البطيخ. تم إجراء عدة دراسات حياتية مخبرية على هذا المتطفل عند ثلاثة درجات حرارة مختلفة (20، 25 و 30 °س). لوحظ أن أنثى المتطفل تفضل التطفل على حشرات المن في العمر الحوري الأول والثاني عند درجات الحرارة المدروسة. كان معدل الفترة الزمنية اللازمة لتطور أنثى المتطفل أطول من تلك للذكر، وبلغت 13.4، 11.2 و 10 أيام للأنثى، بينما تتراوح ما بين 12-12.5، 10-10.5 و 9 أيام للذكور عند درجات الحرارة 20، 25 و 30 °س، على التوالي. تم اعتبار مجموع عدد الحشرات المتحولة إلى مومياء (متطفل عليها) لأنثى المتطفل طول فترة حياتها كمقياس لخصوبة المتطفل. كان معدل كامل خصوبة أنثى المتطفل 107.93، 92.2 و 21.1 عند درجات الحرارة 20، 25 و 30 °س، على التوالي. كان أكبر معدل تطفل اليومي عند درجة حرارة 25 °س، بينما كان طول فترة حياة أنثى المتطفل كانت أقل عند درجة الحرارة 25 °س من تلك عند 20 °س، ولم تكن هناك فروق معنوية بين معدل التطفل العام عند درجتي الحرارة. كانت أعلى نسبة خروج للحشرات الكاملة من المومياء عند درجة حرارة 25 °س ولكن دون فروق معنوية مع تلك عند درجة حرارة 20 °س. بينما كانت الأقل عند 30 °س، ولم يكن هناك تأثير معنوي لدرجات الحرارة في جنس الحشرات الكاملة بالرغم من أنه كان هناك زيادة قليلة لظهور الإناث إذا ازدادت درجات الحرارة. كانت نسبة الإناث للذكور بصورة عامة 1.5:1. تم ملاحظة تغذي حشرات المتطفل على حشرات المن، كان معدل فترة حقن آلة وضع البيض لغرض التغذية أطول من الفترة اللازمة للتطفل، وبلغت 475 ثانية (حوالي 8 دقائق)، بينما احتاجت الإناث إلى 85.9 ثانية (دقيقة ونصف) لوضع بيضتها داخل المن (عملية التطفل) بمدى تراوح ما بين 25-175 ثانية. فشلت عملية التطفل عندما كانت فترة التطفل أقل من 20 ثانية. وتعد عملية التغذية على حشرات المن وسيلة مكافحة إضافية لهذا المتطفل، فقد بلغ عدد حشرات المن المتغذى عليها طيلة حياة أنثى المتطفل 94، 109 و 45 حشرة من، وبلغ المعدل اليومي للتغذية على حشرات المن 6.184، 10.5 و 16.8 حشرة من عند درجات الحرارة 20، 25 و 30 °س، على التوالي.

NE 17

مقارنة فاعلية الطفيليين (*Encarsia Formosa* (Gahan) و *Eretmocerus mundus* (Mercet) في البيئة السورية. رندة أبو طارة¹، فوزي سمارة²، مجد جمال² وفوزي فائق شلبي³. (1) الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية، البريد الإلكتروني: randaaboutara@hotmail.com؛ (2) كلية الزراعة، جامعة دمشق، سورية؛ (3) جامعة الزقازيق، مصر.

تم دراسة فاعلية كل من الطفيليين *Encarsia formosa* و *Eretmocerus mundus* في البيئة المحلية في الظروف الحقلية وعلى مدار عامين متتاليين (2004-2005)، وكان العائل الحشري لهذين الطفيليين ذبابة التبغ البيضاء (*Bemisia tabaci*) أما المضيف النباتي فقد كان نبات أم كلثوم (*Lantana camara*). تم تسجيل نسب التطفل لكلا الطفيليين على مدار العام، كل 15 يوم مرة، كذلك سجلت درجات الحرارة اليومية العظمى والصغرى وأخذت متوسطات لكل 15 يوم. سجل الطفيل *Encarsia Formosa* أعلى نسبة تطفل خلال مدة الدراسة في شهر تشرين الثاني/نوفمبر عام 2004، وبلغت 70.54%، أما أدنى نسبة فكانت 16.07% في شهر آب/أغسطس من عام 2004. كذلك سجل الطفيل *Eretmocerus mundus* أعلى نسبة تطفل خلال عامي 2004-2005 في شهر تشرين الأول/أكتوبر من عام 2004، وبلغت 68.81%، أما نسبة التطفل الأدنى لهذا الطفيل فقد سجلت في شهر آب/أغسطس من عام 2004، وبلغت 17%. وقد تبين أن الطفيليين يقومان بالتطفل الشتوي، بالإضافة إلى وجود نسب تطفل طبيعية عالية وهذا يشير إلى مدى تأقلم هذين الطفيليين في البيئة السورية.

كما بينت النتائج عدم وجود فروق معنوية في متوسط طول العمر بين الذكور والإناث عند التغذية على العسل وكان متوسط العمر 27.4 و 26.5 يوم، على التوالي.

NE 13

دراسة أولية حول دورة حياة والقدرة التطفلية للطفيل *Ratzburgiola incompleta* على حشرة صانعة أنفاق أوراق الحمضيات (*Phyllocnistis citrella*). أمل نادر الخالدي، نزار نومان حمه وناجي جابر هميض وعامره ناجي حسن، المركز الوطني للإدارة المتكاملة للآفات الزراعية، الهيئة العامة للبحوث الزراعية، وزارة الزراعة، بغداد، العراق، البريد الإلكتروني: alasady61@yahoo.com

اعتمدت شتلات نارنج *Citrus aurantium* L. بعمر 1-2 سنة وأجريت لها عدوى صناعية بحشرة صانعة أنفاق أوراق الحمضيات *Phyllocnistis citrella* في منطقة أبي غريب خلال 2004-2005. وقد استغلت ظلة ذات حرارة ورطوبة نسبية شبه مسيطر عليها وتحت إضاءة طبيعية، واستخدم النايلون لتوفير الظروف المطلوبة في الشتاء، بينما استخدم المشبك الزراعي الأخضر في الصيف. أطلقت بالغات المتطفل *Ratzburgiola incompleta* بدفعات مستمرة للحصول على مستعمرة حشرية فعالة تفيد في تنفيذ التجارب اللاحقة بعد حصول الإصابة بالآفة واستقرارها. عند دراسة دورة حياة المتطفل بلغ معدل فترة فقس البيض، معدل الطور اليرقي، معدل الطور العذري ومعدل حياة البالغة 17، 49، 79 و 145 يوماً، على التوالي عند درجة حرارة $22 \pm 2^\circ\text{C}$ ورطوبة نسبية 60-70% وفترة إضاءة 8 ساعة ضوء 16 ساعة ظلام. كذلك أظهرت النتائج أن أغلب الإناث البالغة للمتطفل والمخزنة عند درجة حرارة $25 \pm 2^\circ\text{C}$ لمدة 40 يوماً كان لها القدرة على التزاوج ووضع البيض، وظهر دور واضح في خفض الكثافة العددية لمجتمع الآفة عند إطلاق ذكور وإناث المتطفل بأعداد مختلفة في أقفاص التربية.

NE 14

دراسة بعض الصفات الحياتية للطفيلين *Trissolcus grandis* Thomson و *T. vassilievi* Mayr المتطفلين على بيوض حشرة السونة (*Eurygaster integriceps* Put.) تحت ظروف المختبر. عبد الناصر تريسي¹، محمد عبد الحي² ومصطفى البوحسيني³. (1) جامعة حلب، كلية الزراعة، حلب، سورية؛ (2) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية بحلب، حلب، سورية، البريد الإلكتروني: mohamad_abdulhai@yahoo.com؛ (3) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: M.Bohssini@cgiar.org

تمت دراسة بعض الصفات الحياتية لنوعين من الطفيليات *Trissolcus grandis* Thomson و *T. vassilievi* Mayr (Hymenoptera: Scelionidae) على بيوض حشرة السونة (*Eurygaster integriceps* Put.) تحت ظروف المختبر عند درجة حرارة $23 \pm 2^\circ\text{C}$ ، ورطوبة نسبية 60-70%، وفترة ضوئية 8:16 (ضوء: ظلام) في عام 2005. بينت النتائج أن متوسط فترة حياة الأنثى كانت 19.75 و 12.63 يوماً، متوسط عدد البيوض الذي تطلعت عليه أنثى واحدة 118 و 100 بيضة، نسبة فقس البيوض المتطفل عليها 87 و 85%، نسبة الإناث 89 و 87%، متوسط طول فترة التطور للإناث من مرحلة البيضة وحتى انبثاق الحشرة البالغة 13 و 12 يوماً، وللذكور 12 و 11 يوماً، وذلك للنوعين *T. grandis* و *T. vassilievi*، على التوالي. تشير هذه النتائج إلى أفضلية معنوية للنوع *T. vassilievi* على النوع *T. grandis* بسبب تطفل الإناث على عدد أكبر من بيوض حشرة السونة نتيجة زيادة عمر الأنثى.

NE 15

تأثير درجات الحرارة في بعض الصفات الحياتية للطفيل *Trissolcus vassilievi* Mayer المتطفل على بيوض حشرة السونة *Eurygaster integriceps* put. عبد الناصر تريسي¹، مصطفى البوحسيني² وأحمد قزیز¹. (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية، البريد الإلكتروني: n-trissi@scs-net.org؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: M.Bohssini@cgiar.org

تعتبر طفيليات بيوض حشرة السونة *Eurygaster integriceps* put. من أهم الأعداء الحيوية التي تحد من كثافة مجتمع الآفة في الحقول المصابة، حيث تتواجد طبيعياً في معظم مناطق انتشار الحشرة. ويعد النوع *Trissolcus vassilievi* Mayer (Hymenoptera: Scelionidae) من الأنواع المهمة المنتشرة في سورية. درس تأثير ثلاث درجات حرارة (20، 23 و $26 \pm 1^\circ\text{C}$) في بعض الصفات الحياتية لهذا الطفيل. لوحظ وجود فروقات معنوية في خصوبة إناث الطفيل باختلاف درجات الحرارة، حيث ازداد عدد البيوض الموضوعة مع ارتفاع درجة الحرارة ليصل إلى 92 بيضة عند درجة حرارة 26°C ، في حين لم يتجاوز 65 بيضة عند درجة حرارة 20°C . كما تأثرت طول فترة تطور الإناث بشكل ملحوظ حيث بلغت 21.2 و 11.1 يوماً، وذلك عند درجة حرارة 20 و 26°C ، على التوالي. وكان من الواضح أيضاً زيادة فترة بقاء

NE 10

دراسة حياتية للمتطفل الداخلي *Dolichognida trachalus* (Nixon) على يرقات فراشة براعم الزيتون/فراشة الياسمين *Palpita unionalis* Hübner في سورية. محمود صبري لبابيدي، قسم وقاية النبات، كلية الزراعة، جامعة حلب، ص.ب. 12052، حلب، سورية، البريد الإلكتروني: mslababi@scs-net.org

أظهرت نتائج الدراسات الحياتية الحالية أن إناث المتطفل (*Dolichognida trachalus* (Nixon, 1965) (Lepidoptera :Braconidae) تضع البيض داخليا وبشكل إفرادي في يرقات العمر الأول، وأحيانا الثاني، لفراشة براعم الزيتون *Palpita unionalis* Hübner (Lepidoptera :Pyralidae) كعائل رئيسي لها. تخرج يرقات المتطفل المكتملة النمو، للتعذر، من عائلها البرقي ذو العمر الرابع. تراوحت فترة تطور (دورة الحياة) المتطفل من 10 إلى 15 يوما تحت ظروف درجة حرارة ورطوبة نسبية مختبرية 25°س و65%. بلغت فترتا حضانة البيض والتطور البرقي من 5 إلى 9 أيام، وفترة تطور العذراء من 4 إلى 6 أيام تحت الظروف المختبرية نفسها. وقد استغرقت مدة حياة كلا جنسي الحشرة فترة تتراوح من 8.6 إلى 15.8 يوما تحت ظروف مختبرية عادية من درجات حرارة 15 إلى 30°س ورطوبة نسبية 60-70%. أشارت نتائج الدراسة أن النسبة الجنسية للمتطفل (إناث : ذكور) كانت 1:0.8. ومن الجدير بالذكر أن النسبة المئوية للتطفل حقليا، من قبل شبه الطفيل المدروس، قد اختلفت اختلافا كبيرا من سنة لأخرى ومن وقت لآخر من السنة ذاتها، وأخيرا من منطقة لأخرى في سورية. يستنتج من ذلك أهمية المتطفل وما يمكن أن يلعبه من دور فاعل، مع عوامل أحيائية ولا أحيائية أخرى، في السيطرة على مجاميع فراشة براعم الزيتون وتخفيض كثافتها إلى ما دون الحد الإقتصادي لضررها وإدخاله في برامج الإدارة المتكاملة لأفات الزيتون الحشرية.

NE 11

الحصر والوفرة الموسمية لمتطفل حافرة أنفاق الحمضيات (*Phyllocnistis citrella* Stainton) على الحمضيات في الساحل السوري. قيس غزال، مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، مديرية زراعة اللاذقية، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: Kaisgazal@shufbc.com

تمت دراسة وحصر طفيليات حافرة أنفاق الحمضيات (من عام 2003-2005 سجلت أربع طفيليات، وكان الطفيل المستورد من استراليا عام 1995 (*Semiolachar petiolatus* Girault) الأكثر تواجدا مشكلا نسبة عالية من مجموع الطفيليات، وبلغت نسبته في الأعوام الثلاثة على التوالي 87.34، 93.54 و 98.45%. أما الطفيل المحلي *Ratzburgiola incompleta* فبلغت نسبته على التوالي 10.98، 4.1 و 0.77%. بينما بلغت نسبة تواجد الطفيل المحلي *Citrostichus phyllocnistoides* Narayanan 0.0، 0.93 و 0.38% على التوالي، وكذلك بلغت نسبة الطفيل المحلي *Neochrysocharis formosa* 0.56، 0.19 و 0.0% في الأعوام الثلاثة، على التوالي.

NE 12

دراسة بعض الصفات الحيوية للطفيل *Ooencyrtus* sp. خالد مارديني¹ وعادل اليهري². (1) مشروع حصر وتصنيف حشرات البيئة القطرية، مركز أصدقاء البيئة، ص.ب. 1822، الدوحة، قطر، البريد الإلكتروني: Kmardini@hotmail.com؛ (2) وزارة الشؤون البلدية والزراعة، الدوحة، قطر.

عرف من الجنس *Ooencyrtus* sp. (Encyrtidae: Hymenoptera) 56 نوعا موزعة في كل القارات، وهي حشرات صغيرة جدا تتطفل على مختلف بيوض الحشرات، وبشكل رئيسي على رتبتي حرشفية الأجنحة (Lepidoptera) ونصفية الأجنحة (Hemiptera). يتطفل هذا النوع على بيوض الفراشة من فصيلة *Lasiocampidae* التي تهاجم أوراق أشجار *Conocarpus* sp. المزروعة في مدينة الدوحة بقطر، وتؤدي الإصابة الشديدة إلى تعرية الأشجار من أوراقها. وقد تم دراسة تطور نسبة التطفل على بيوض الآفة في الطبيعة منذ ظهور الآفة وحتى دخولها في طور السكون، وبينت النتائج أن النسبة المئوية للطع البيض المتطفل عليها في الجيل الأول للآفة 20%، في بلغت 75% في الجيل الأخير للآفة. كما تم دراسة عدد أفراد الطفيل الناتجة من بيضة واحدة، وحساب النسبة الجنسية للطفيل (في الطبيعة)، وبينت النتائج أن متوسط عدد أفراد الطفيل المنبثقة من بيضة واحدة في الطبيعة بلغ 0.55 ± 6.05 فرد، كما بلغ متوسط نسبة التطفل في لطعة البيض الواحدة (في الطبيعة) 6.55 ± 97.29 %. وبينت نتائج التحليل الإحصائي وجود فروق معنوية (عند مستوى احتمال 0.05) بين النسبة الجنسية عند الإناث والذكور، وبلغت النسبة عند الإناث 14.3 ± 61.9 ، وعند الذكور 14.3 ± 38.1 %. وتم تحديد متوسط طول عمر الحشرات الكاملة للطفيل (ذكور وإناث)، مخبريا وذلك بوجود غذاء العسل، وبعدم وجود غذاء، ودون وجود العائل (بيض الآفة). وبينت نتائج التحليل الإحصائي وجود فروق معنوية بين متوسط طول عمر أنثى الطفيل عند التغذية على العسل وعدم وجود غذاء، فكان متوسط العمر 27.4 و 3.7 يوم، على التوالي، وكانت النتيجة مماثلة بالنسبة لمتوسط طول عمر الذكور.

NE 7

فونا الطفيل *Encarsia Foerter* في محافظة كيلان، إيران. حميد ساكنين جلاو¹، حسن قهاري² وشعبان عبد رابو³. (1) فرع قائم شهر، جامعة الحر السلامي، مازانداران، إيران، البريد الإلكتروني: hchelave@yahoo.com؛ (2) قسم الزراعة، جامعة الحر السلامي، طهران، إيران، البريد الإلكتروني: h_ghahhari@yahoo.com؛ (3) معهد بحوث وقاية النبات، وزارة الزراعة، الدقي، الحيزة، مصر، البريد الإلكتروني: shaaban59@yahoo.com

خلال جولات المسح الحقلية الذي تم من 1999 إلى 2004 في مناطق مختلفة من محافظة كيلان بهدف جمع وتربية الذباب الأبيض (Homoptera: Aleyrodidae) والحشرات القشرية (Homoptera: Coccoidea). تم جمع وتعريف 18 نوعاً تابعة للجنس *Encarsia Foerster* (Chalcidoidea: Aphelinidae)، وهي: *E. aurantii*، *E. acaudaleyrodidis* Hayat، *E. elongata* (Dozier)، *E. elegans* Masi، *E. citrina* (Craw)، *E. berlessei* (Howard)، *E. azimi* Hayat، *E. fasciata* Hayat، *E. lounsburyi* (Berlese & Paoli)، *Encarsia inaron* (Walker)، *E. formosa* Gahan، *E. smithi* (Silvestri)، *E. protransvena* Viggiani، *E. perniciosi* (Tower)، *E. luteola* Howard، *E. lutea* (Masi) و *E. sophia* (Girault & Dodd). أربعة أنواع منها (*E. sophia*، *E. protransvena*، *E. leuteola* و *E. smithi*) تسجل لأول مرة في إيران. في هذه الدراسة بالإضافة إلى إدخال أنواع الجنس *Encarsia* spp. في محافظة كيلان، فقد تم وصف الأنواع الجديدة ورسم صور تصنيفية لها.

NE 8

دراسة الكفاءة الحيوية والإنتشار الحقلية وقيم أهم المؤشرات البيولوجية للمتطفل *Anagyrus agragensis* Saraswat واختيار أفضل طرق التربية والإكثار في الساحل السوري. ناديا الخطيب¹ ولؤي أصلان² (1) مديرية الزراعة الإصلاح الزراعي باللاذقية، مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، ص.ب 2012، اللاذقية، سورية، البريد الإلكتروني: nadia@arabscientist.org؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، دمشق، سورية، البريد الإلكتروني: louai@arabscientist.org

أجريت الدراسة خلال عامي 2001 و2002 في مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، حيث تم أخذ عينات مصابة في كل من حدائق المدينة والحقول المفتوحة بأنواع مختلفة من البق الدقيقي: *Planococcus citri* Risso، *Pseudococcus comstocki* Kuwana و *Pseudococcus adonidium* Linne. تم تعريف المتطفل *Anagyrus agragensis* Saraswat المدروس في المتحف البريطاني للحشرات عام 2001 وتم تحديد نسبته وتربيته على كل نوع من أنواع البق الدقيقي كل على حدة وذلك باستخدام البطاطا/البطاطس كعائل مخبري، ومن ثم تمت دراسة قيم أهم المؤشرات البيولوجية للطفيل (دورة الحياة، طول عمر الذكور والإناث، المعدل الجنسي). أظهرت النتائج أن الطفيل يتواجد على مدار أشهر السنة ووصلت أعلى نسبة له خلال شهر حزيران/يونيو، وقد تشابهت نسبة وجوده في المواقع المدروسة. بلغت مدة جيل الطفيل من الحشرة الكاملة إلى الحشرة الكاملة 2.77±18.8، 1.82±19.4 و 1.92±20.2 يوماً، على التوالي. بلغ مؤشر طول عمر الذكور على كل نوع من أنواع البق الدقيقي المدروسة 1.75±9.8، 1.51±8.60 و 2.23±8.9 ولإناث 2.07±10.4، 2.13±9.15 و 1.71±9.4 يوماً، على التوالي. ولم تظهر النتائج فروقاً معنوية على مستوى العائل أو الجنس وكانت النسبة الجنسية للطفيل 1:1. كما أظهر الطفيل ارتباطاً سلبياً ضعيفاً مع درجات الحرارة (r=-0.13) وارتباطاً سلبياً متوسطاً مع درجات الرطوبة السائدة (r=-0.58).

NE 9

ملاحظات مظهرية وسلوكية الطفيل *Pteromalus puparum* L. على دودة أوراق الحمضيات *Papilio demoleus* L. مع أهمية خاصة على دور التنافس في منطقة كردستان. فيروز رمضان حسن وطلال طاهر محمود، قسم الغابات، كلية الزراعة، جامعة دهوك، إقليم كردستان، العراق، البريد الإلكتروني: feyrozrh77@yahoo.com

أظهرت النتائج بأن أنثى الطفيل *Pteromalus puparum* L. تضع بيضها بشكل جماعي داخل جسم يرقة العائل دودة أوراق الحمضيات (*Papilio demoleus* L.)، وتتغذى يرقة الطفيل بعد الفقس على محتويات جسم العائل و تتطور بداخله إلى أن يدخل العائل طور التعذير. وتستمر بالتطور إلى أن تتعذر أيضاً وتخرج بالغة الطفيل من فتحات صغيرة دائرية الشكل من أماكن مختلفة من جسم عذراء العائل، وبذا يتسبب في موتها وعدم خروج بالغة دودة أوراق الحمضيات. معدل عدد البيض الموضوع من قبل أنثى الطفيل حوالي 27.77 بيضة/يرقة في الحقل و 208.38 بيضة/يرقة تحت ظروف المختبر (درجة حرارة 25 °س ورطوبة نسبية 53%) مع نسبة تطفل 72.5% و 100% في الحقل والمختبر، على التوالي.

(1997 - 2002)، تم استيراد أربعة أنواع من طفيليات المنّ من عدة دول بغرض إضافة عوامل مساعدة لأنواع الطفيليات المحلية ضد أنواع من الحبوب الرئيسية في حقول القمح في مصر وأمريكا. تم تجميع أنواع الطفيليات من سورية، والمغرب، وإيران حيث يقترب مناخ هذه المناطق بيئياً من مناخ كل من مصر العليا وجنوب كاليفورنيا (الولايات المتحدة الأمريكية). تم تقويم كفاءة الأنواع المستوردة وهي: *Aphidius matricariae* Haliday (سورية)، *Diaeretiella rapae* M'Intosh (المغرب)، *Aphelinus albipodus* Hayat & (Hymenoptera: Aphidiidae) *Aphidius rhopalosiphii* De Stefani (Hymenoptera: Aphelinidae) Fatima (إيران) تحت ظروف المختبر والدفينات والحقل المفتوح. أظهرت أنواع الطفيليات المختبرة اختلافات في تفصيل نوع العائل، كفاءة التطفل، الظروف المناسبة. تفوق النوع *A. matricariae* على الأنواع الأخرى تحت ذات الظروف.

NE 5

تسجيلات جديدة ومسح حقلي لأنواع من الطفيليات على ذبابة المقات (ذبابة ثمار القرعيات) وذبابة ثمار الخوخ لأول مرة في مصر. بدر الصباح عبد المنعم فتوح، قسم آفات الخضر، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: badrelsabah@yahoo.com
أجري مسح حقلي لحصر الطفيليات بمحافظة الجيزة في مصر بغرض الاستفادة منها في برامج مكافحة المتكاملة، لاسيما أن كلا من ذبابة المقات وذبابة ثمار الخوخ هما من الآفات التي ظهرت حديثاً في مصر وليس لهما أعداء حيوية، مما ساعد على سرعة انتشارهما، حتى أصبحتا تتسبب بخسائر فادحة للخضر والفاكهة على السواء. تم خلال هذه الدراسة حصر ثلاثة أنواع طفيليات داخلية لليرقات والعذارى على كل من الذبابتين المدروستين، وتتبع لثلاثة أجناس، تندرج في فصيلتين تحت رتبة غشائية الأجنحة، وهي: *Dirhinus griffii* (Chalcididae)، *Spalangia cameroni* (= *Spalangia afra*) (Pteromalidae) و *Pachycrepoides videmmiæ* (Pteromalidae). تم حساب نسبة تطفلها الطبيعي في الحقل على الخضر مثل: القثاء البيضاء الفيرانية والقثاء المخططة والكوسا والخيار واللوب، وعلى الفاكهة مثل: الخوخ والبرتقال والمانجو والجوافة واليوسفي. وكانت أعلى نسبة تطفل من نصيب القثاء البيضاء حيث بلغت 13.3% بين مختلف الخضر والفاكهة محل الدراسة، وأقل نسبة تطفل في اللوف (0%). وكانت أعلى نسبة تطفل بين الفاكهة من نصيب الخوخ (9%)، وأقل نسبة تطفل على البرتقال (3.6%). وعموماً تتواجد هذه الطفيليات في الفترة التي تنشط فيها ذبابة المقات ومنها انتقلت للتطفل على ذبابة الخوخ لكثرة أعدادها.

NE 6

دراسة مورفولوجية وبيولوجية المتطفل *Encarsia porteri* Mercet. حميد ساكنين جلاو¹، حسن قهاري²، مهرداد طبري³ وشعبان عبد رابو³. (1) فرع قائم شهر، جامعة الحر السلامي، مازانداران، إيران، البريد الإلكتروني: hchelave@yahoo.com؛ (2) قسم الزراعة، جامعة الحرالسلامي، طهران، إيران، البريد الإلكتروني: h_ghahhari@yahoo.com؛ (3) معهد بحوث الرز، أمل، إيران؛ (4) معهد بحوث وقاية النبات، وزارة الزراعة، الدقي، الجيزة، مصر، البريد الإلكتروني: shaaban59@yahoo.com

تمت دراسة مورفولوجية وبيولوجية وسلوكية للمتطفل *Encarsia porteri* (Hymenoptera: Aphelinidae) تحت ظروف الدفيئة عند درجة حرارة 24 ± 2 °س ورطوبة نسبية $65 \pm 5\%$ و16 ساعة إضاءة على محصول القطن (*Gossypium hirsutum* L. var. *ultan*). تمت الدراسة المورفولوجية بشكل منفصل لكل من الذكور والإناث البالغة واليرقات. تم تعريف ستة أطوار حياة للمتطفل (البيضة، ثلاثة أعمار يرقيّة، العذراء والحشرة الكاملة). من بين الأنواع المختلفة للذبابة البيضاء وأطوارها الحياتية، وجد أن الطور اليرقي الثاني للذبابة *Bemisia tabaci* Gennadius والطور اليرقي الرابع للذبابة *Trialeurodes vaporariorum* Westwood أكثر الأطوار تفضيلاً للمتطفل. تتطفل الإناث الملقحة للمتطفل على كل من الطور اليرقي الثاني للذبابة *B. tabaci* وبيوض فراشة جوز القطن *Heliothis armigera* Huebner (Lepidoptera: Noctuidae)، لكن الإناث غير الملقحة تتطفل على بيوض فراشة جوز القطن فقط. أظهرت نتائج هذه الدراسة أن المتطفل *E. porteri* هي زلقط منطلق، لا مفرطة التطفل ولا ذاتية فرط التطفل. سببت التغذية بدم العائل مع محلول من العسل 15% تأثير كبير في طول العمر والكفاءة لدى الإناث الملقحة وغير الملقحة للمتطفل. كان طول عمر وخصوبة الإناث الملقحة للمتطفل معنوية أكثر من غير الإناث الملقحة، وكان أفضل معدل تطفل 1-25 للطور اليرقي الثاني للذبابة *B. tabaci* و 1-15 لبيوض فراشة جوز القطن. كما تمت دراسة سلوك التسايف ووضع البيض للمتطفل.

NE 1

Aphytis lingnanensis كطفيل فعال لمكافحة الحشرات القشرية في مصر. شعبان عبد ربه ومنى مصطفى، معهد بحوث وقاية النباتات، مركز البحوث الزراعي، 7 شارع نادى الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: shaaban59@yahoo.com

يعد الطفيل *Aphytis lingnanensis* من الطفيليات الهامة في مكافحة بعض أنواع الحشرات القشرية في مصر. وجد خلال المسح الذي أجري في أماكن متفرقة في مصر لهذا الطفيل خلال الفترة 2003-2005 بأنه يتطفل على خمسة أنواع من الحشرات القشرية وهي: (*Aonidiella aurantii* (Maskell)، *Aspidotus nerii* Bouche، *Chrysomphalus aonidum* (L.)، *Chrysomphalus dictyospermi* (Morgan)، *Hemiberlesia latania* (Signort)، *Insulaspis pallidula* (Green) و *Parlatoria ziziphi* (Lucas) و *Pseudaulacaspis pentagona* (Targioni-Tozzetti). درست الوفرة الموسمية لهذا الطفيل في الفترة ما بين 2003-2005 في أربع محافظات في مصر (القليوبية، الجيزة، البحيرة والشرقية)، وقد تراوحت أعلى نسبة تطفل لهذا الطفيل على الحشرات القشرية سابقة الذكر ما بين 10-65%. واتضح من خلال هذا العمل أيضاً أن هذا الطفيل من الطفيليات الهامة في مكافحة *A. aurantii* و *C. aonidum* في مصر.

NE 2

طفيليات الطور اليرقي لفرشة درنات البطاطا/البطاطس (*Phthorimaea operculella* Zell.) في حقول البطاطا/البطاطس والبنندورة/الطماطم. محمد سمير توفيق عباس، سلوى سيد محمد عبد الصمد، قسم بحوث مكافحة الحيوية، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: salwa_ssss@yahoo.com

تم حصر طفيليات الطور اليرقي لفرشة درنات البطاطا/البطاطس في حقول البطاطا/البطاطس والبنندورة/الطماطم التجريبية في محافظة المنوفية خلال عام 2003. وجد 3 أنواع من الطفيليات تهاجم يرقات فراشة درنات البطاطا/البطاطس في حقول البطاطا/البطاطس، نوعين من الطفيليات الداخلية (*Diadegma* و *Apanteles litae* var. *operculella* Nixon) ونوع واحد من الطفيليات الخارجية (*Bracon instalilis* Marshal). كما وجد أن النوع الأخير هو الوحيد الذي يتطفل على يرقات فراشة درنات البطاطا/البطاطس التي تهاجم أوراق نبات البنندورة/الطماطم وبنسب تطفل تتراوح ما بين 0-21.4% ومتوسط 11.3%. وكانت النسب المئوية للتطفل في حقول البطاطا/البطاطس 5.6، 10.8 و 2.6% للطفيليات *A. litae*، *B. instabilis* و *D. molliplum*، على التوالي، بإجمالي نسبة تطفل تتراوح ما بين 11-28.6% وبمتوسط عام 19.1%.

NE 3

دراسة مورفولوجية وبيولوجية على طفيل البيض *Monorthochaeta nigra* كعامل مكافحة حيوية للخنفساء السلحفائية على الشوندر السكري/البنجر (*Cassida vittata*). أمال أحمد الزغبى، قسم بحوث مكافحة الحيوية، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادى الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: amalzoghby@hotmail.com

أوضحت الدراسات المورفولوجية لطفيل الفردي الداخلي (*Monorthochaeta nigra*) على بيض الخنفساء السلحفائية التي تعتبر آفة شديدة الإصابة لنباتات بنجر السكر/الشوندر السكري في مصر (وخاصة المحافظات الشمالية) أن له 3 أطوار يرقية، إذ وصفت هذه الأطوار اليرقية وصفا مورفولوجيا كاملا. كما أظهرت أن للطفيل فترة بيات صيفي طويل عند درجة حرارة 30 °س، واستغرقت دورة حياة الطفيل عند درجة حرارة المختبر 20±5 °س ورطوبة نسبية 55±5% مدة 22-28 يوماً. أما عند زيادة درجة الحرارة إلى 25 °س عند ذات درجات الرطوبة استغرقت حياة الطفيل 14-19 يوماً. بينما سجل دورة الحياة 17-19 يوماً عند درجة حرارة 20 °س والرطوبة النسبية 85%. أما عند درجة الحرارة 25 °س فقدت هذه الفترة ما بين 13-17 يوماً مرتبطة برطوبة نسبية 85%.

NE 4

تقويم بعض أنواع طفيليات المن ضد من الحبوب تحت ظروف المختبر والديانات وحقول القمح المفتوحة. أحمد الهندي¹، دان جونزالس² وداليا عنلى¹. (1) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الجيزة، ص.ب. 915، المعادي، القاهرة، مصر، البريد الإلكتروني: aheneidy@link.net (2) قسم الحشرات، جامعة كاليفورنيا، ريفرسايد، كاليفورنيا، الولايات المتحدة الأمريكية، البريد الإلكتروني: danielzgonzalez@earthlink.net

تهاجم حشرة المن محاصيل الحبوب، خاصة القمح والشعير والذرة في معظم بلدان العالم. وتعتبر عملية استيراد واستيطان طفيليات المن أحد طرق مكافحة البيولوجية الفاعلة. ومن خلال مشروع للتعاون المصري/الأمريكي

أعداء حيوية

المختلفة (جذور، سوق، مجموع خضري) لنوعين من الأعشاب الشتوية (*Brassica nigra* L. و *Sinapis arvensis* L.) في إنبات ونمو بادرات الحمص الشتوي صنق "غاب 3" وذلك تحت ظروف متحكم بها في غرفة الإنبات، في مختبر صحة البذور في المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا). تبين من النتائج أن تأثير المستخلصات أدى إلى تثبيط الإنبات وخفض نمو كل من السويقة والجذير. واستمر هذا التأثير في الأطوار المتقدمة من النمو الخضري للنبات إذ ظهر في خفض الوزن الرطب والجاف لكل من المجموع الجذري والخضري لنباتات الحمص (صنف غاب 3). وكان التأثير أكبر في المعاملات التي استخدم فيها مستخلص البذور لكلا النوعين في إنبات البذور وفي طول الساق والجذور والوزن الرطب والجاف للجذور والمجموع الخضري، إذ انخفضت نسبة الإنبات بشكل معنوي مقارنة بالشاهد. وازداد هذا الانخفاض في الإنبات مع زيادة التركيز المستخدم من المستخلص النباتي حتى توقف عند التركيز الثالث لبعض المستخلصات. و كان تأثير مستخلصات الجذور والمجموع الخضري في كل من نسبة الإنبات وطول الساق والجذور، والوزن الرطب والجاف للجذور والمجموع الخضري مثبتاً بفارق معنوي عن الشاهد ولكن بدرجة أقل من تأثير مستخلص البذور. وعند المقارنة مابين تأثير مستخلصات كل من النوعين، تبين أن تأثير مستخلصات *S. arvensis* كان أكبر من مستخلصات *B. nigra*. نجد من خلال هذه النتائج أن تأثير مستخلص البذور كان أكبر مقارنة مع بقية الأجزاء الأخرى سواء ضمن النوع الواحد أو ما بين الأنواع وكان تأثير العشب *S. arvensis* أكبر من النوع *B. nigra*. كما ناقشت الدراسة أهمية هذا التأثير في إنبات ونمو نباتات الحمص، الذي ينعكس بالتالي على الإنتاجية. كما يؤكد ضرورة مكافحة هذين النوعين عند تواجدهما في الحقل وفي وقت مبكر من موسم نمو المحصول، للحيلولة دون بدء عملية المنافسة مابين هذين العشبين ونباتات الحمص.

الجزائر حسب الإحصائيات الأخيرة 11750 بيتا، رغم ذلك فإن مردودية الإنتاج تبقى ضعيفة ولا تتناسب والمساحة المزروعة، ويعود السبب في ذلك على وجه الخصوص إلى الأمراض الفطرية؛ كاللفحة المتأخرة المتسببة عن فطر *Phytophthora sp.*، العفن الرمادي المتسبب عن *Botrytis sp.*، والبياض الدقيقي الذي يسببه فطر *Erysiph*. يلجأ المزارعين لاستخدام المبيدات الفطرية ذات التصنيع الكيميائي لمكافحة هذه الآفات، التي أصبحت اليوم تطرح مشاكل بيئية ذات انعكاسات سلبية على صحة الإنسان. في هذا السياق تم إختبار تأثير بعض الزيوت العطرية المستخلصة من النباتات في نمو بعض الفطريات الممرضة *Phytophthora*، فتبين أن هناك بعض الزيوت لها تأثير تثبيطي على نمو هد الفطر، مما قد يسمح باستخدامها كمبيدات حيوية للفطريات.

EX 30

الكفاءة التثبيطية لبعض المستخلصات النباتية في تضاعف فيروس البطاطا واي (PVY). عبدالقادر خضير عباس¹، رقيب عاكف العاني² وميسر مجيد جرجيس². (1) الهيئة العامة للبحوث الزراعية، وزارة الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: Mysirem@Yahoo.com؛ (2) كلية الزراعة، جامعة بغداد، أبو غريب بغداد، العراق.

تم تحديد كفاءة المستخلصات الكحولية النباتية لبعض النباتات في تضاعف فيروس البطاطا واي (PVY)، واعتمد إختبار الإليزا (ELISA) المصلي في تقدير تركيز الفيروس في النباتات المعاملة. أوضحت النتائج أن رش نباتات البطاطا/البطاطس المعداة (الملقحة) بفيروس البطاطا واي بمستخلص نبات العفص ومستخلص قشور الرمان وحامض التانيك بتركيز 5 غ/ليتر قد أدت إلى اختفاء الفيروس تماماً من النباتات بعد 8، 16 و 16 يوماً، على التوالي. لم يؤدي رش نباتات البطاطا/البطاطس المعداة بالفيروس نفسه بمستخلص قشور الرمان بالتركيز 3 غ/ليتر إلى اختفاء كلي للفيروس، في حين اختفى الفيروس عند رش النباتات المعداة بمستخلص العفص عند التركيز نفسه بعد 12 يوماً. أدى رش نباتات البطاطا/البطاطس السليمة بالتركيز 5 غ/ليتر لكل من مستخلص العفص وقشور الرمان حماية للنباتات من الإصابة مدة 12 و 8 أيام، على التوالي. لم يلاحظ على النباتات المعاملة بالمستخلصات أي تأثيرات معنوية في الوزن الجاف للمجموع الخضري.

EX 31

تأثير مستخلصات بعض النباتات في تقليل تلف درنات البطاطا/البطاطس المخزنة صنف دزري. عمر هاشم مصلح المحمدي ومحمد قاسم محمد الجبوري، قسم البستنة، كلية الزراعة، جامعة بغداد، بغداد، العراق، البريد الإلكتروني: omar_hasham@yahoo.com

أجريت الدراسة على درنات البطاطا/البطاطس (*Solanum tuberosum L.*) صنف "دزري" للعروة الربيعية للموسم الزراعي 2002 والتي زرعت وخرنت في حقول ومخازن قسم البستنة في كلية الزراعة بجامعة بغداد. تم إجراء عملية العلاج التجفيفي للدرنات عند درجة حرارة 15 ± 1 °س ورطوبة نسبية 80-85% ولمدة 15 يوماً. بعدها تم تغطيس الدرنات بمستخلصات كل من الحلبة، الكراوية، الباميا، السدر وشمع (V.G) (Vapor Guard). استخدمت ثلاثة تراكيز لكل من المواد أنفاً فضلاً عن معاملة المقارنة. غطست الدرنات في المستخلصات أعلاه لمدة 10 و 20 دقيقة بعدها خزن في المخزن المبرد عند درجة حرارة 4 ± 1 °س ورطوبة نسبية 80-85% لمدة ثلاثة أشهر. نقلت بعدها الدرنات للتكييف عند درجة حرارة 26-31°س ورطوبة نسبية 45-50% لتمثل البديل عن حالة التسويق. استخدم تصميم القطاعات العشوائية الكاملة (RCBD) بأربعة مكررات للمعاملة الواحدة، وقد تمت المقارنة حسب إختبار أقل فرق معنوي (LSD) عند مستوى احتمال 5%. أظهرت النتائج معاملات التداخل الثلاثي لمعاملة مستخلص الباميا عند المدة 20 دقيقة والتراكيز 25، 50 و 100% ومعاملة مستخلص الكراوية عند المدة 20 دقيقة والتركيز 8 غ/ليتر ومعاملة الشمع كفاءة في منع حدوث التلف نهاية مدة الخزن واستمرار فعل هذه المعاملات في منع حدوث التلف حتى نهاية مدة التكييف. كما عملت معاملة التشميع بالـ VG في خفض النسبة المئوية للتلف إلى 0.34% نهاية مدة الخزن وإلى 0.52% نهاية مدة التكييف.

EX 32

تأثير المنافسة الخفية للأعشاب الضارة في إنبات ونمو بادرات الحمص (*Cicer arietinum L.*). باسمه برهوم¹، عبد الله أبو زخم² وأنور المعمار². (1) مركز البحوث الزراعية في الغاب، الهيئة العامة للبحوث العلمية الزراعية، الغاب، سورية، البريد الإلكتروني: engbasima-m@maktoob.com؛ (2) كلية الزراعة، جامعة دمشق، دمشق، سورية، البريد الإلكتروني: anwar-ma@scs-net.org

تتجاوز المنافسة بين الحمص والأعشاب الضارة الحدود المعروفة للمنافسة وتتعداها إلى المنافسة الخفية، التي ظهرت تأثيراتها في دراسات سابقة بأشكال مختلفة من تثبيط عملية الإنبات أو التأثير في عملية نمو كل من الساق والجذير للبادرات الفتية، مما ينعكس سلباً على إنتاجية محصول الحمص. في هذا البحث تم إختبار تأثير ثلاثة تراكيز من مستخلصات الأجزاء

EX 26

التأثير الأليوباثي لأشجار الحمضيات على بعض فطريات التربة. جنان عبد الخالق سعيد ونديم أحمد رمضان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com
تناول البحث دراسة تأثير المستخلصات ومغسولات أوراق بعض أشجار الحمضيات (البرتقال، الليمون الحامض، الليمون الحلو، الفارنج) في أعداد الفطريات المتواجدة في الترب تحت هذه الأشجار، والتي تشمل *Rhizoctonia solani*، *Fusarium spp.*، *Macrophomina spp.*، *Stemphyllium spp.*، *Aspergillus spp.* و *Penicillium spp.*. أظهرت النتائج تبايناً في التأثير الأليوباثي لمستخلصات ومغسولات أشجار الحمضيات المختلفة مع وجود تباين في تأثير التراكيز المستخدمة لكل من المستخلصات والمغسولات والتي تشمل 2، 4، 6، 8 و 10% (وزن:حجم)، موضحة بأن التأثير الأليوباثي ازداد بزيادة التركيز. وظهر وجود اختلاف في استجابة الأنواع الفطرية المستخدمة في الدراسة، فحصلت زيادة في أعداد الفطريات *Aspergillus spp.* و *Penicillium spp.*، واختزلت أعداد فطريات *Fusarium spp.* و *Rhizoctonia solani*، في حين لم تتأثر أعداد الفطر *Stemphyllium spp.* في التربة. كما لوحظ تأثير الأليوباثي عند إضافة أوراق الأشجار المذكورة وتحسينها في التربة لمدة ثلاثة أسابيع، حيث حصلت زيادة في أعداد بعض الأنواع الفطرية ونقص في أعداد الفطريات الأخرى.

EX 27

تأثير زيوت ومستخلصات بعض النباتات في مكافحة فطر *Botrytis allii* المسبب لمرض عفن الرقبة في البصل. هايدي إبراهيم جبر أبو النجا¹ و نجلاء جلال أحمد². (1) قسم أمراض النبات، كلية الزراعة، جامعة أسيوط، مصر؛ (2) معهد بحوث أمراض نبات، مركز البحوث الزراعية، الجيزة، مصر.
تم دراسة تأثير المستخلص المائي لكل من القرنفل والقرفة والزعتر والحلبة والخله والفلفل الأسود وزيوت نباتات العتر وحب البركة والكافور في النمو الميسليومي للفطر *Botrytis allii* (Munn)، وفي نسبة الإصابة وسدنتها. بينت النتائج المتحصل عليها أن المستخلص المائي لنبات القرنفل كان ذو تأثير أكثر فاعلية من المستخلص المائي للفلفل الأسود، يليه مستخلص الحلبة في تثبيط النمو الميسليومي للفطر، بينما كان تأثير المستخلص المائي للخله والزعتر والقرفة أقل فاعلية. كما أظهرت الدراسة أن زيت العتر كان أكثر كفاءة في تثبيط النمو الميسليومي للفطر، تلاه الكافور، ثم زيت حبة البركة. وكانت النتائج المتحصل عليها في المختبر مشابهة لنتائج المخزن. وقد أظهر المستخلص المائي لنبات القرنفل تأثيراً أفضل من المستخلص المائي للفلفل الأسود، ثم الحلبة في تقليل نسبة الإصابة وسدنتها في حين أن زيت العتر كان أفضل من زيت الكافور ثم زيت حبة البركة في خفض نسبة الإصابة وكذلك شدة المرض.

EX 28

استخدام بعض المستخلصات النباتية في مكافحة مرض الذبول الفيوزاريومي على بادرات الباباي. علي خميس رويشد وأمل حامد منيع، قسم وقاية النبات، كلية الزراعة، جامعة عدن، ص.ب. 260، كريتر، عدن، اليمن، البريد الإلكتروني: Rowaishedak@hotmail.com
تعرض شتلات الباباي لإصابة شديدة بمرض الذبول الفيوزاريومي الذي يسببه فطر *Fusarium oxysporum*، وتصل نسبة الإصابة إلى 70% في بعض المشاتل. تهدف هذه الدراسة إلى تقييم كفاءة بعض المبيدات الحيوية من خلال المستخلصات النباتية لبعض النباتات وهي: النيم *Azadirachta indica*، السول *Prosopis juliflora* والعشر *Calotropis procera* في مكافحة المرض. تم إختبار تأثير المستخلصات المائية لأوراق النباتات الثلاثة في نمو الفطر المسبب للمرض مختبرياً. كما تم إختبار تأثير إضافة هذه المستخلصات إلى التربة المنزرعة بالباباي في إصابة البادرات بمرض الذبول تحت ظروف الصوبة/الدفيئة. دلت النتائج على أن المستخلصات النباتية المختبرة قد ثبطت النمو الفطري، بلغت 56.9، 55.8 و 77.0% مع العشر، النيم والسول، على التوالي. وبذلك يكون مستخلص نبات العشر قد تفوق على المستخلصات الأخرى. كما أظهرت النتائج أن إضافة المستخلصات النباتية الثلاثة إلى التربة قد أدى إلى خفض نسبة الإصابة بالذبول في بادرات الباباي، وبلغت نسبة الإصابة 9.2% عند استخدام مستخلص العشر، و 17 و 18.6% عند استخدام مستخلصات السول والنيم، على التوالي. وتؤكد النتائج فاعلية هذه المستخلصات في مكافحة المرض، وأن ذلك قد يعود إلى احتوائها على مركبات الكبريت أو بعض القلويدات أو الأحماض الأمينية السامة للفطر.

EX 29

تأثير بعض الزيوت العطرية في نمو بعض الفطريات الممرضة *Phytophthora sp.* محمد بو الجدري، قسم علم البيئة والمحيط، كلية العلوم، جامعة جيجل، الجزائر، البريد الإلكتروني: m_bouljedri@yahoo.com
تعد الخضراوات مجموعة نباتية اقتصادية مهمة خصوصاً منها نباتات العائلة البانجانجية (Solanaceae) والعائلة القرعية (Cucurbitaceae)، وهي تزرع في مساحات شاسعة في الحقول أو البيوت البلاستيكية. بلغ عدد البيوت البلاستيكية في

بمستخلص القرنفل بتركيز 2.5، 5 و 10% أو بمستخلص نبات سُمّ القران بتركيز 12.5، 25 و 50%. وتم رش نباتات المجموعة الثانية بمعلق زيت القرنفل بتركيز 2.5، 5 و 10% أو بزيت الحبة السوداء أو بزيت الزيتون أو بزيت الجرجير بتركيز 2، 4 و 8%. وتم رش نباتات المجموع الثالثة بماء الصنبور/الحنفية أو بالمبيد توباس بتركيز 12.5، 25 و 50 مل/100 لتر واستخدمت كشواهد للمقارنة. أظهرت النتيجة نتائجاً واضحة في نسبة إنبات أبواغ الفطر الممرض، وفي النسبة المئوية لحدوث المرض وشدته كلما زاد تركيز كل من المستخلصات أو الزيوت النباتية المستخدمة.

EX 23

استخدام بعض المستخلصات النباتية في مكافحة مرض البياض الدقيقي على الخيار بمنطقة البيضاء- ليبيا. يونس مصادف بدر، عيسى علي بوغرسه ومحمود كريم الحويطي، قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني: aasa2080@yahoo.com، goody3cot@yahoo.com
استخدمت أربعة مستخلصات نباتية من الثوم والزعر والأكليل والخردل لمكافحة البياض الدقيقي (*Spherotheca fulginea*) على الخيار. تم معاملة نباتات الخيار قبل أحداث العدوى أو بعدها لمعرفة كفاءة هذه المستخلصات. أظهرت نتائج هذه الدراسة وجود تأثيرات معنوية لهذه المستخلصات في مكافحة المرض عند استخدامها قبل أو بعد أحداث العدوى على نباتات الخيار بالمقارنة مع الشاهد. وكان أفضلها مستخلص الخردل والثوم عند استخدامها قبل العدوى، وبلغ متوسط الإصابة في كلا المعاملتين 6.6 و 7.7%، على التوالي. وكان مستخلص الزعر أقلها فاعلية، وبلغ متوسط الإصابة 22.8%. وكانت هذه المستخلصات فعالة خلال الأسابيع الثلاثة الأولى بعد أحداث العدوى، وكان أفضلها كفاءة مستخلص الخردل، وبلغ متوسط الإصابة في هذه المعاملة 7.7%، وإمتازت بصورة معنوية عن المعاملات الأخرى. وكان مستخلص الإكليل أقلها تأثيراً، وبلغ متوسط الإصابة 25.1%.

EX 24

تأثير الزيوت المستخلصة من الحبة السوداء (*Nigella sativa* L.) وبعض المركبات التربينية في إنبات أبواغ الفطر *Mauginiella scaettae* عبد العزيز نكسانة ونور الدين بالطار، قسم علوم الحياة، كلية العلوم، جامعة سطيف 19000 الجزائر، البريد الإلكتروني: taxanna@yahoo.fr
تشكل مكافحة الفطريات الممرضة للنباتات باستخدام المبيدات الكيميائية معضلة بيئية وصحية كبيرة لما يترتب عنها من آثار سلبية على البيئة والمحيط. جاءت هذه الدراسة لمحاولة معرفة مدى تأثير الفعل التنشيطي للزيت الأساسي للحبة السوداء *Nigella sativa* L. وبعض المكونات التربينية على إنبات أبواغ فطر *Mauginiella scaettae* المسبب لمرض خياس طلع النخيل. وتم استخدام وسط مستخلص الشعير الصلب لزراعة أبواغ الفطر واتباع طريقة ماكفرلان في حساب تركيز اللقاح الذي كان مساوياً إلى 10^8 خلية/مل. واستعملت أقراص من ورق ترشيح خاصة بالمضادات الحيوية شبتت بتركيز مختلفة من العينات المختبرة لتقدير الفعل التنشيطي للزيت الأساسي ومكوناته. أظهرت نتائج التنشيط أن الزيت الثابت للحبة السوداء بتركيز 1 مغ/قرص كان تثبيطه ضعيفاً، ولم يتجاوز قطره 12 مم بينما أعطى الزيت الأساسي عند تركيز 125 ميكروغرام/قرص تثبيطاً كلياً بقطر 90 مم. كذلك أعطى لكرفاكرو (carvacrol) عند التركيز 1035 ميكروغرام/قرص تثبيطاً كلياً في إنبات أبواغ الفطر، وصل قطره إلى 90 مم. وأعطى التيموكينون (thymoquinone) عند التركيز 43.5 ميكروغرام/قرص تثبيطاً بقطر 32 مم. وكانت التربينات الهيدروكربونية (α -pinene و p-cymene) عديمة التأثير في إنبات الأبواغ.

EX 25

مكافحة فطر الذبول الفيوزاريومي على نبات الطماطم/البندورة بمستخلصات نباتية. عيسى علي بوغرسه¹، محمد علي سعيد² ومحمد سالم بوهدمة². (1) كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا؛ (2) أمانة الزراعة الجبل الأخضر، البيضاء، ص.ب. 390، ليبيا، البريد الإلكتروني: msbuhidma@hotmail.com
يعذ فطر ذبول فيوزاريوم *Fusarium oxysporum* f.sp *lycopersici* ممرضاً رئيساً لنبات الطماطم/البندورة في منطقة حوض المتوسط وخاصة في منطقة الجبل الأخضر في ليبيا، ويسبب هذا المرض انخفاضاً معنوياً في محصول الطماطم/البندورة على جميع الأصناف المزروعة. عُزل الفطر من مواقع زراعة الطماطم/البندورة في منطقة الجبل وأجريت عليه مكافحة بمستخلصات نباتية مخبرياً، وكانت فعالة. وتم اختبارها مع طرائق مكافحة أخرى في الحقل على صنفين من نبات الطماطم/البندورة (Marco و Plaza) ولوحظ انخفاض معنوي في درجة الإصابة ونسبة ذبول فيوزاريوم بعد 49 يوماً من الزراعة، وكان أفضل المستخلصات فاعلية بعد المبيد الفطري Tachigaren مستخلص الثوم.

البطنج/النعناع *Mentha longifolia* L. عند إضافتها إلى المستنبت الغذائي بطاطا دكستروز أجار (PDA). بينت النتائج اختلاف كفاءة المساحيق النباتية المستعملة في تثبيط نمو بعض الفطريات المختبرة، كما اختلف تأثير المسحوق الواحد باختلاف الفطر. وأحدث مسحوق قشور الرمان أعلى نسبة تثبيط في نمو جميع الفطريات المدروسة، وبلغت كفاءته 100% عند معاملة الفطر *Alternaria alternata*، وتلاه في الكفاءة مسحوق أوراق البطنج/النعناع والقرنبيط، وبلغت أعلى نسبة تثبيط لكل منهما ضد الفطر *A. alternata* 77.12 و 82.00%، على التوالي. وأظهرت المساحيق المدروسة كفاءة أقل إزاء الفطر *A. niger*.

EX 20

الأثر المضاد عند مستخلصات ثمار الحمضيات وأوراقها في معدل نمو الأنواع الممرضة من الجنس *Alternaria* وإنبات أبواغها. عباس علي ديهبوري¹، أ. ماجد²، ف. الأفي³ وف. فالاهيان⁴. (1) قسم علم الحياة، جامعة آزاد الإسلامية في غامشاهر، إيران؛ (2) قسم علوم الحياة، جامعة طهران شمال آزاد، إيران؛ مركز البحوث الزراعية في مازاندران غاهاد، إيران؛ (4) قسم علوم الحياة، جامعة آزاد للبحوث العلمية، طهران، إيران، البريد الإلكتروني: adehpour@yahoo.com يضم الجنس *Alternaria* أنواعا مختلفة تحدث عدة أمراض نباتية، وتنتج توكسينات ومواد مسرطنة، وإضطرابات تحسسية وتنفسية. وتلعب تلك الأنواع بدورها المعروف كمرضات ما بعد قطاف الحمضيات. ويعتبر النوعان *A. citri* و *A. alternate* pv. *citri* من أهم الأنواع المحدثة لمرض التعفن الأسود والتبقع البني عند الحمضيات، إذ رصد قدرتها على إحداث خسائر إقتصادية هامة في شمال إيران. تهدف هذه الدراسة إلى إغناء مداركنا في مجال الخصائص المورفولوجية للفطور وكذلك الأثر المضاد لمستخلصات ثمار الحمضيات وأوراقها في إنبات أبواغ *Alternaria* spp. ومعدل نموها الميسليومي. جمعت عزلات متعددة من هذا الفطر شملت مناطق مختلفة من إيران وحضر منها مزارع نقيّة على مستنبت PDA وقدر نمو غزلها الفطري عند درجات حرارة مختلفة، كما فُيم الأثر التضادي للمستخلص الميثانولي للثمار والأوراق في نمو الفطر ومن ثم اختبر تأثير المستخلص المائي. حققت أبواغ عدة أنواع في ثمار سليمة غير ناضجة ثم رصد تطور الأعراض عليها، تحت ظروف متحكم فيها في المختبر وكذلك تحت ظروف طبيعية. أظهرت النتائج تشابه الخصائص المورفولوجية لأبواغ العزلتين المدروستين، وكانت 25^o هي الدرجة المثلى لنمو الميسليوم. وتباينت المستعمرات في لونها وفي كثافة وارتفاع غزلها الفطري. وظهر أن الطبقة الداخلية للقشرة هو الموقع الرئيس لإختراق الثمرة وإصابتها. واتصف جلد الثمرة غير الناضجة بمقاومته الكاملة وعدم تمكن الميسليوم من إختراقه. ونتج عن حقن الأبواغ في الثمرة تطور كل من التعفن الطري والجاف. وكبح المستخلص الميثانولي لصنف Thomson Navel من معدل نمو الميسليوم. أما المستخلص المائي فلم يؤثر في كل من إنبات الأبواغ ونمو الميسليوم.

EX 21

تأثير المركبات الفينولية المستخلصة من أوراق وكالس القرنفل *Dianthus caryophyllus* في نمو فطري *Fusarium oxysporum* و *Fusarium culmorum*. خزعل علي أمين وفراس حميد خضير، قسم علوم الحياة، كلية التربية، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com توصلت الدراسة إلى معرفة تأثير بعض منظمات النمو النباتية في استحداث ونمو وإعادة إكثار (تجديد) كالس نبات القرنفل *Dianthus caryophyllus*. أظهرت النتائج وجود تباين في استحداث الكالس من الأجزاء النباتية المختلفة (السوق، الأوراق الفلجية، الجذور، السوق تحت الفلجية) عند إضافة تراكيز مختلفة من (BA و 2.4-D) و (IAA و BA). وكان BA بتركيز 0.1 مغ /ليتر مع 2,4 D بتركيز 0.5 مغ /ليتر أفضلها في استحداث الكالس بنسب عالية. نجحت الدراسة في تثبيط نمو الفطرين *Fusarium culmorum* و *Fusarium oxysporum* باستخدام المستخلصات الكحولية الخام الحاوية على المركبات الفينولية للأوراق الناتجة من البذور، وكالس الأوراق والأوراق الناتجة من إعادة إكثار الكالس، وكان أفضلها تأثيرا المستخلص الكحولي لكالس الأوراق، وبنسبة تثبيط 67.7%.

EX 22

استخدام بدائل طبيعية لمكافحة البياض الدقيقي على الخيار المتسبب عن فطر *Sphaerotheca fuliginea* تحت ظروف البيوت المحمية التجارية 1- تأثير بعض المستخلصات والزيوت النباتية. عبده مهدي محمد مهدي، محمد هارون عبد المجيد، فائق محمود عبد اللطيف وجمال محمد عاشور، قسم النبات الزراعي، كلية الزراعة، مشتهر، جامعة بنها، مصر، البريد الإلكتروني: abdou_mahdy@hotmail.com أجريت تجربتان خلال موسمي الربيع والخريف عام 2003. تم دراسة تأثير بعض المستخلصات النباتية وزيوت بعض النباتات في التجربة الأولى في إنبات أبواغ فطر *Sphaerotheca fuliginea* المسبب لمرض البياض الدقيقي على الخيار تحت ظروف المختبر. وزعت نباتات الخيار صنف بريمو (عمر 4 أسابيع) في التجربة الثانية إلى ثلاثة مجموعات تحت ظروف البيوت المحمية التجارية. تم رش نباتات المجموعة الأولى بالمستخلص المائي لنباتات الثوم بتركيز 5، 10 و 20% أو

بالمستخلص الخضري (G). هدفت تلك المعاملات إلى مكافحة نيماتودا تعقد الجذور *Meloidogyne spp.* على نباتات البندورة في البيوت المحمية في اللاذقية ضمن محطة أبحاث الصنوبر خلال عامي 2004 و 2005. أظهرت النتائج تفوق المعاملات B و C و D على بقية المعاملات مقارنة بالشاهد وذلك بكفاءة عالية بلغت 100%. ولم يلاحظ وجود فروق معنوية بين المعاملات E، F، G و A مقارنة بالشاهد في نهاية التجربة، وأدت إلى تخفيض متوسط الكثافة العددية للنيماتودا المتطفلة في التربة بنسبة تراوحت ما بين 60-65% وتخفيض عدد العقد الجذرية بنسبة 70-75%. وأعطت المعاملة A تأثيرا جيدا لمدة شهر بعد الزراعة في التخلص من الإصابة النيماتودية الميكرة وكفاءة 100% متفوقة بذلك على المعاملات E، F و G. تم الحصول على نتائج مشجعة كبداية آمنة بيئيا عوضاً عن استخدام المبيدات الكيميائية ذات الأثر المتبقي في المنتجات الزراعية والبيئة، حيث تبين من خلال الدراسة إمكانية الاستفادة من نبات القطيفة في الناحية التطبيقية كنبات صائد وقاتل للنيماتودا المتطفلة في التربة إما عن طريق إضافة المضافات النباتية لنبات القطيفة الجذرية والخضرية وإضافة الشتلات بالكامل، أو من خلال تخفيض متوسط الكثافة العددية للنيماتودا المتطفلة في التربة وإبقائها دون العتبة الاقتصادية وبالتالي تخفيض عدد وشكل حجم العقد عن طريق استخدام الزراعة البينية وتطبيق الرش بالمستخلصات النباتية الزهرية والجذرية والخضرية.

EX 17

التأثير المضاد لبعض المستخلصات النباتية في تكوين التدرنات التاجية المتسببة عن البكتيريا *Agrobacterium tumefaciens* على بادرات البازلاء. نجوى إبراهيم البرهاوي، قسم علوم الحياة، كلية التربية، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: dr_najwa2000@yahoo.com

بينت نتائج هذه الدراسة تباين التأثيرات المضادة لمستخلصات أوراق نبات الأوكالبتس *Eucalyptus camaldulensis* والأس *Myrtus communis* والرمان *Runica grantum* عند إضافتها إلى الأوساط المغذية، في نمو البكتيريا *A. tumefaciens* وفي تكوينها للتدرنات التاجية على السوق تحت الفلجية لبادرات البازلاء (*Pisum sativum L.*). وبلغت أقطار منطقة التثبيط المتكونة حول مستعمراتها النامية في مستنبت الأجار المغذي 22، 13 و 12 مم، على التوالي، وانخفضت أعداد التدرنات التاجية من 6 إلى 1، 2 و 4 تدرن/6 جروح، والنسب المئوية للإصابة من 95% إلى 15 و 31 و 75%، على التوالي. عند تنمية هذه القطع على مستنبت MS الصلب غير المدعم أو المدعم بهذه المستخلصات الثلاثة. وبينت النتائج أيضاً نجاح تكون العقد الجذرية على بادرات البازلاء بعد سبعة أيام من إصابتها بالبكتيريا *A. tumefaciens* وتلقيحها بالبكتيريا *Rhizobium leguminosarum biovar vicia*، عند تنميتها على المستنبت المغذي الصلب الخالي من النتروجين والمدعم بالمستخلصات المذكورة أعلاه قياساً بعينة الشاهد.

EX 18

التثبيط الاحيائي لتفكك نسج أصناف البطاطا/البطاطس المصابة بسلالات جرثومة *Erwinia*. روضة محمد أمين شريف محمود الرمضاني، خولة أحمد محمود محمد آل فليح وأديبة يونس شريف حمو النعمان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: drsarabashamaa@yahoo.com

استخدمت الأوراق الجافة لليوكالبتوس والكرفس وثمار السبج والحنظل والبنجل للسيطرة على ضراوة سلالات جرثومة *Erwinia* التي تصيب البطاطا. وأظهرت النتائج قدرة المسحوق الجاف لأوراق اليوكالبتوس *Eucalyptus camaldulensis* في تثبيط أو منع تفكك نسج البطاطا/البطاطس المصابة وذلك بنسبة 56.1-100% مقارنة مع الشاهد، كما وصلت هذه النسبة عند استخدام مسحوق أوراق الكرفس *Apium graveolens* إلى 23.1-100% مقارنة بالشاهد. وأظهر مسحوق ثمار الحنظل *Citrullus colocynthis* تأثيراً متبايناً فكان مثبطين لتفكك نسج البطاطا/البطاطس للأصناف بيليني، كولومبوس، ديرزية وريكولتاء بنسبة تراوحت ما بين 17.5-77.1% مقارنة بالشاهد، ومحفزاً لتفكك نسج الصنف عجيبة بنسبة تراوحت ما بين 7.4-25.5% مقارنة بالشاهد. أما مسحوق ثمار البنجل فكان له تأثيراً تثبيطياً لتفكك نسج صنف بيليني المصاب بالسلالات الثلاث بنسبة تراوحت ما بين 27.5-50.0% في حين كان له تأثير محفز لتفكك نسج بقية أصناف البطاطا المصابة بالسلالات بنسبة تراوحت بين 0.6-66.4%.

EX 19

استجابة بعض مسببات الممرضة الفطرية المرافقة لثمار العنب المخزونة لمساحيق بعض الأجزاء النباتية. صبا باقر الجبوري¹ وكامل سلمان جبر¹ وعدنان إبراهيم السامرائي². (1) قسم وقاية النبات، كلية الزراعة، أبو غريب، جامعة بغداد، بغداد، العراق؛ (2) وزارة العلوم والتكنولوجيا، بغداد، العراق، البريد الإلكتروني: wisam_ali2004@yahoo.com نفذت هذه الدراسة في مختبرات كلية الزراعة بجامعة بغداد بهدف تحديد مدى تأثير بعض الفطريات المرافقة لثمار العنب المخزونة بمساحيق قشور الرمان *Punica granatum* أو أوراق نباتات القرنبيط *Brassica oleracea var. botrytis* أو

EX 13

تأثير تطبيقات مختلفة من المبيد الطبيعي النيم في لمكافحة آفات حشرية في الحقل والمختبر. على عبد الله باعوم¹ وعبد القادر محمد بن عثمان². (1) مركز بحوث الأغذية وتقانات ما بعد الحصاد، الهيئة العامة للبحوث الزراعية، خور مكسر، عدن، اليمن، البريد الإلكتروني: baoumali@hotmail.com؛ (2) قسم الوقاية، محطة الأبحاث الزراعية، الكود، اليمن. أجريت في محطة الأبحاث الزراعية ومركز بحوث الأغذية وتقانات ما بعد الحصاد في اليمن عدد من التجارب الحقلية والمختبرية بهدف معرفة تأثير جرعات مختلفة من مستخلص بذور النيم/المريمر (زيت البذور وكذلك مسحوق الأوراق) في بعض الآفات الزراعية الحشرية. تضمنت الآفات المختبرة كل من التريبس (*Thrips tabaci*) على محصول البصل، الذبابة البيضاء (*Bemisia tabaci*) على محصول الطماطم/البندورة، خنفساء اللوبياء (*Callosobruchus maculatus*) على محصول اللوبياء، وثاقبة الحبوب الصغرى (*Rhizopertha dominica*) على محصول الذرة الرفيعة. استخدم الزيت بجرعات 5، 10 و 15 سم³/ليتر ماء في كل من التجارب الحقلية للطماطم/البندورة والبصل. أظهرت النتائج أفضلية للجرعة 15 سم³/ليتر ماء عند مستوى معنوية 5% في انخفاض الإصابة مقارنة بالشاهد. استخدم الزيت لمكافحة خنفساء اللوبياء خطأ مع بذور اللوبياء بجرعات 3، 5 و 10 سم³/كغ بذور في تجارب المختبر، ومسحوق أوراق المريمر 5، 10، 15 و 20 غ/كغ بذور، أجريت أيضاً تجربة لمكافحة ثاقبة الحبوب الصغرى على الذرة الرفيعة باستخدام مسحوق أوراق المريمر 5، 10، 15 و 20 غ/كغ بذور. أعطت نتائج تجارب المختبر أفضلية للتركيزات العالية في مكافحة مقارنة بالشاهد، وتظل مكافحة بزيت النيم الأفضل مقارنة بمسحوق الأوراق.

EX 14

النشاط الإبادي لمستخلصات أوراق بعض النباتات ضد نيماتودا تعقد الجذور *Meloidogyne incognita*. سميرة سلامي و أ. مزركات، فرع النبات، المعهد القومي للعلوم الفلاحية، الحراش 16200، الجزائر، البريد الإلكتروني: hamsella@yahoo.fr تم اختبار النشاط الإبادي لمستخلصات أوراق 6 أنواع من النباتات (*Rosmarinus officinalis*) ضد بيض ويرقات الطور الثاني لنيماتودا تعقد الجذور *M. incognita* في المختبر. أظهرت النتائج اختلاف تأثير المستخلصات النباتية المختبرة فيما بينها على نسبة موت يرقات الطور الثاني للنيماتودا، وكذلك على تثبيط فقس اليرقات من البيض، وأن موت اليرقات وكذلك تثبيط فقس اليرقات من البيض تناسبتا طردياً مع التركيز المستخدم من المستخلص النباتي ومع زمن التعريض. وقد حقق مستخلص أوراق نبات *Coriandrum sativum* نسبة موت في يرقات الطور الثاني لنيماتودا قدرها 100%.

EX 15

تأثير المستخلصات المائية لنباتي السبج (*Melia azadarach*) والدفلة (*Nerium oleander*) في خفض إصابة المزارع النسيجية لنبات عباد/زهرة الشمس (*Helianthus annuus*) بنيماتودا تعقد الجذور. هناء سعيد الصالح، حسين اسماعيل ارتين وأزهار حسين علي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: anmaraltaee1978@yahoo.com، hanasa59@yahoo.com تمت دراسة تأثير المستخلصات المائية لنباتي السبج (*M. azadarach*) والدفلة (*N. oleander*) على مزارع الكالس (المستحدث من بادران نبات زهرة الشمس *H. annuus*) الملحقة بنيماتودا تعقد الجذور (*Meloidogyne spp.*). تناولت الدراسة الخصائص المظهرية لخلايا الكالس إضافة إلى المقاييس الكيموحيوية التي شملت تركيز البروتين والكاربوهيدرات والأحماض النووية في نسيج الكالس. أوضحت النتائج أن إضافة المستخلص المائي للسبج والدفلة بالتركيزات 1.5 و 2.5 ملغ/مل من وسط الزراعة على التوالي قد حفز نمو الكالس، كما أدى إلى خفض أعداد النيماتودا وأعداد البيوض وأكياس البيض، مقارنة بالشاهد.

EX 16

دراسة تأثير فعالية استخدام بعض المستخلصات لنبات القطيفة (*Tagetes spp.*) في مكافحة نيماتودا تعقد الجذور *Meloidogyne spp.* على نبات البندورة/الطماطم في البيوت المحمية في اللاذقية. فيصل الفرواتي، أسما حيدر، منهل البلخي، ميسون عطية، مخلص سلمان، عادة زيني، قسم بحوث النيماتودا، إدارة بحوث وقاية النبات، مركز البحوث العلمية الزراعية في اللاذقية، بوقا، سورية، البريد الإلكتروني: frwfai88@scs-net.org اختبر تأثير فعالية استخدام بعض المستخلصات والمضافات النباتية لنبات القطيفة (*Tagetes spp.*) وهي الزراعة البينية لشتلات القطيفة بين نباتات البندورة/البندورة (A)، إضافة الشتلات بالكامل للتربة (B)، إضافة المجموع الجذري للتربة (C)، إضافة المجموع الخضري للتربة (D)، الرش بالمستخلص الزهري (E)، الرش بالمستخلص الجذري (F)، الرش

والتربيني والزيتي والمائي للخشب العصاري والصميمي لأشجار السنوبر كانت أكثر سمية من بقية المركبات. فيما أظهر المستخلص القلويدي للخشب الصميمي للسنوبر والجنار والخشب العصاري لليوكالبتوس أعلى سمية لشغالات حشرة الأرضة/النمل الأبيض إذ بلغت قيم الـ LC50 حوالي 0.045، 0.045 و 0.040، على التوالي.

EX 10

دراسة فاعلية بعض المستخلصات النباتية كطاردات وممانعات وضع البيض لخنفساء اللوبياء *Callosobruchus maculatus* على بذور الحمص. محمد إبراهيم و غزالة لوافي، الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث حمص، دائرة بحوث وقاية النبات، ص.ب. 626، حمص، سورية، البريد الإلكتروني: gcsarhomcin@mail.sy.

اختبرت التأثيرات الطاردة والممانعة لوضع البيض لمستخلصات الكمون، الشمرة، الشبت، الزعتر، الثوم، الأزدرخت، الكينا و الفليفلة على خنفساء اللوبياء تحت ظروف مخبر الحشرات بمركز بحوث حمص في الفترة ما بين 2002-2004 بتقييم نسبة الطرد لخنفساء اللوبياء، *Callosobruchus maculatus* Fab (Coleoptera: Bruchidae) على محصول الحمص، واستخدم المبخر الدوراني لاستخلاص الزيوت النباتية باستخدام مذيب الكحول واختبرت فاعلية المستخلصات النباتية السابقة الذكر باستخدام ثلاثة تراكيز وهي (0.5، 1 و 2%) على الأطوار البالغة لحشرة خنفساء اللوبياء. أشارت النتائج إلى أن المستخلص الكحولي لبذور الشبت والكمون بتركيز 2% أعطت أعلى نسبة طرد وبلغت على الترتيب 100 و 99.6% يليه المستخلص الكحولي لفصوص الثوم ب 95.36% وأوراق الكينا ب 93.33% وبنفس التركيز. أما عند تركيز 1% للمستخلص الكحولي لبذور الشبت والكمون بلغت نسبة الطرد 95.69 و 94.44% على التوالي. نستنتج إن المستخلص الكحولي لكل من بذور الشبت والكمون فعال جدا ويمكن استخدامه كمادة واقية وطاردة لبذور الحمص من خنفساء اللوبياء *C. maculatus* تحت ظروف المخزن بتركيز 2%. ويمكن استخدامها أيضا كمعقمات للبذار المعد للزراعة أو للاستهلاك باعطائه نكهة الشبت أو الكمون واعتبارها مبيدات نباتية مضافة إلى المبيدات الكيماوية والتي يمكن استبدالها بها وتحضيرها كناتج نهائي وبشكل جيد ومناسب.

EX 11

دراسة أثر مستخلصات النباتات *Eucalyptus gomphocephala*، *Schinus molle* و *Melia azedarah* على الجراد الصحراوي *Schistocerca gregaria* في المختبر. عتيقة قندوز بن ريمة¹ وبهية دومانجي ميتيش². (1) جامعة سعد دحلب، صندوق بريد رقم 09، 09470، الصومعة، البليدة، الجزائر، البريد الإلكتروني: atiguen@yahoo.fr (2) معهد العلوم الفلاحية، الحراش، الجزائر.

درس تأثير مستخلصات أوراق نباتات من الأنواع *E. gomphocephala*، *M. Azedarah* و *S. molle* في الأنثى البالغة للجراد الصحراوي، أجريت تجربة أولى تم خلالها ضخ المستخلصات النباتية في الجراد. وجد أن 100% من الجراد مات في اليوم الرابع من ضخ مستخلص *S. molle*. أما بالنسبة لمستخلصات *E. gomphocephala* و *M. azedarah*، فقد قللت شهية الجراد وأخرت وضع البيض وذلك بتأثير البروتينات الموجودة في المستخلصات في وضع البيض. وفي التجربة الثانية تم رش المستخلصات على النبات المفضل للجراد *Trifolium alexandrenum*، وجد أن 80% من الجراد الصحراوي مات بعد 20 يوما من الرش. وكان تأثير نباتات النوعين *M. Azedarach* و *E. gomphocephala* فقدان الشهية وعدم تكوين البيوض.

EX 12

كفاءة تراكيز مختلفة لزيت النيم ضد ذبابة الياسمين البيضاء (*Aleuroclava jasmine*) على أشجار الحمضيات/الموالح. حسين علي طه، منتهى صادق حسن، وفاء هادي صالح ورؤى ثائر ثامر، الهيئة العامة للبحوث الزراعية، بغداد، العراق، البريد الإلكتروني: hu_alani@yahoo.co.uk

اختبرت كفاءة تراكيز مختلفة (1، 2 و 4 مل/ليتر ماء) من زيت النيم ضد ذبابة الياسمين البيضاء (*Aleuroclava jasmine*) على أشجار الحمضيات. أوضحت النتائج بأن التركيز 4 مل/ليتر ماء قد أعطى كفاءة على بيوض الحشرة بلغت 91.3، 98.0، 65.0 و 54.5 و 13.7% بعد مرور 4، 6، 10، 15 و 20 يوما، على التوالي، في حين كان تأثيره في الفترات نفسها على الحوريات 56.6، 96.3، 79.1، 50.4 و 41.9%، على التوالي. وقد أظهرت التراكيز الأقل (1 و 2 مل/ليتر ماء) فاعلية لمدة 10 أيام فقط، وترواحت ما بين 35.8 و 63.8% على البيض، و 19.7 و 72.6% على الحوريات، على التوالي. وتؤكد هذه النتائج أن استعمال التركيز 4 مل/ليتر ماء يوفر حماية كافية لمدة ثلاث أسابيع، وأنه قد يكون هناك حاجة لرشه ثانية بعد مرور هذه الفترة.

EX 7

التأثير الطارد للزيوت العطرية النباتية ضد ثلاثة أنواع من البعوض (*Aedes*, *Anopheles* و *Culex*). عبد الكريم عامر¹ وهانز ميلهورن² (1) جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني: a_m_amer@yahoo.com؛ (2) قسم الحيوان وبيولوجي الخلية والباراسيتولوجي، جامعة هاينرش هاين دويسلدورف، ألمانيا، البريد الإلكتروني: mehlhorn@uni-duesseldorf.de

يعود الاستخدام المتعدد للمركبات المستخرجة من النباتات إلى زمن قديم، إلا أن استخدامها ضد الآفات انخفض بشكل كبير مع تطور وانتشار المركبات الكيميائية، وبرزت حالياً مع إدراك المخاطر البيئية وزيادة الاهتمام بالصحة العامة، الحاجة إلى اكتشاف مركبات طبيعية يمكن استخدامها ضد الآفات الحشرية وخاصة الحشرات الناقلة للأمراض. وأصبح من المهم جداً الحصول على وقاية جيدة مع توفر شروط الأمان للصحة العامة والبيئة. تم في هذه الدراسة إختبار 41 نوعاً من الزيوت النباتية و 11 مخلوطاً زيتياً ضد بعوض الحمى الصفراء (*Aedes aegypti* Linnaeus) وناقل الملاريا (*Anopheles stephensi* Liston) والبعوض الناقل للفلاريا والالتهاب السحائي (*Culex quinquefasciatus* Say) (Diptera: Culicidae). تم الإختبار باستخدام متطوعين وفي صورة مستحضرات مختلفة. واستناداً إلى زمن الحماية والنسبة المئوية للطرد كانت الزيوت الخمسة التالية أفضلها: [Litsea cubeba] Litsea، (Cajeput) (*Melaleuca leucadendron*)، Niaouli (*Melaleuca quinquenervia*)، Violet (*Viola odorata*) و Catnip (*Nepeta cataria*)، إذ أعطت زمن حماية زاد عن 480 دقيقة مع 100% طرد ضد الأنواع الثلاثة.

EX 8

دراسة خصائص مجموعة من الزيوت العطرية النباتية ضد يرقات ثلاثة أنواع من البعوض (*Anopheles*, *Aedes* و *Culex*). عبد الكريم عامر¹ وهانز ميلهورن². (1) جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني: a_m_amer@yahoo.com؛ (2) قسم الحيوان وبيولوجي الخلية والباراسيتولوجي، جامعة هاينرش هاين دويسلدورف، ألمانيا، البريد الإلكتروني: mehlhorn@uni-duesseldorf.de

باعتبار أن المياه الراكدة هي البيئة اللازمة ليرقات البعوض فقد كان من السهل استهداف هذا الطور بعدد من وسائل مكافحة البعوض. ولأن استخدام المبيدات التقليدية في الماء ينطوي عليه مخاطر كثيرة، فقد برزت المبيدات الطبيعية لاسيما تلك المستخرجة من النباتات كوسيلة واعدة في هذا المجال. وتعد النباتات العطرية وزيوته الطيارة مصدر مهم جداً لعدد كبير من المركبات الطبيعية التي تستخدم في مجالات متعددة. في هذه الدراسة تم تقييم 41 نوعاً من الزيوت النباتية ضد الطور اليرقي الثالث للبعوض الناقل للحمى الصفراء (*Aedes aegypti*) وناقل الملاريا (*Anopheles stephensi*) والبعوض الناقل للفلاريا والالتهاب السحائي (*Culex quinquefasciatus*). تم إختبار كل زيت ضد يرقات *Aedes aegypti* باستخدام المحلول المائي للزيت بتركيز 50 جزء بالمليون. أظهرت النتائج الأولية أن 13 نوعاً من الزيوت أعطت نسبة قتل 100% بعد أقل من 24 ساعة من التعرض وهي: Amyris، Black Pepper، Camphor، Cedarwood، Dill، Myrtle، Frankincense، Helichrysum، Juniper، Lemon، Sandalwood، Thyme و Verbena. اختبرت هذه الزيوت ضد يرقات الطور الثالث لأنواع البعوض الثلاثة وذلك بخمسة تراكيز مختلفة (1، 10، 50، 100، 500 جزء بالمليون). وتم حساب LC₅₀ لكل زيت ضد كل نوع من البعوض إذ تراوح ما بين 1-101.3 جزء بالمليون ضد يرقات *Aedes aegypti* و 9.7-4101.4 جزء بالمليون عند *Anopheles stephensi* و 1-50.2 جزء بالمليون عند يرقات *Culex quinquefasciatus*. كما اختبرت بقائية السمية للزيوت عن طريق تخزين المحاليل المائية للزيوت بتركيز 50 جزء بالمليون تحت ظروف مختلفة (الضوء والظلام: التهوية والإغلاق) لمدة شهر بعد تحضير المحلول. اختبرت المحاليل المخزنة ضد يرقات *Aedes aegypti* أربع مرات طوال فترة التخزين. بعض الزيوت حافظ على فعاليته حتى الإختبار الأخير وذلك تحت ظروف تخزين محددة، في حين بعض المحاليل فقدت سميته خلال فترة قصيرة بعد التحضير.

EX 9

التأثير السام لبعض المركبات الكيميائية للخشب العصاري والصميمي لبعض أشجار الغابات في حشرة الأرضة/النمل الأبيض. نزار مصطفى الملاح، وليد عبودي قصير، شاهين عباس مصطفى، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: e_madk@maktoob.com، shahinkifre@yahoo.com

أظهرت نتائج دراسة التأثير القاتل للمستخلصات الفينولية والتربينية والقلويدية والمائية للخشب العصاري والصميمي لأشجار الجنار والحوار والسرو والصفصاف والصنوبر واليوكالبتوس في شغالات حشرة الأرضة/النمل الأبيض وجود فروقات معنوية في سمية المركبات تبعاً لنوع المركب ونوع الخشب ونوع الأشجار المستخدمة في الدراسة. وأن المستخلص الفينولي

المكونات الأوكسيجينية (الألدهيدات والكيونات والأحماض الدهنية واستراتها) 90.11% في مكونات المركب المفصول B. وكان الحامض الدهني الهكساديكانويك أسيد من المكونات الرئيسية بنسبة 22.69% في المركب المفصول B.

EX 4

فاعلية بعض المستخلصات النباتية على نصابة فاكهة البحر المتوسط *Ceratitis capitata* (Wied) وتأثير أنظمة مختلفة من الإضاءة في حيوتها. ربيعة أرباب وعمران أبو صلاح، كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا، البريد الإلكتروني: Cat_ra2005@yahoo.com

تم اختبار فاعلية أربعة مستخلصات نباتية مستخرجة من الأوراق والرؤوس المزهرة لنبات الزعتر (*Thymus capitatus*) وفصوص الثوم (*Allium sativum*) وأوراق الشيح (*Artemisia herba-abla*) وأوراق تفاح الشاي/الميرمية (*Salvia fruticosa*) على يرقات وبالغات نصابة فاكهة البحر الأبيض المتوسط (*Ceratitis capitata* Wied). بينت نتائج الدراسة وجود تأثير قاتل في اليرقات، اختلفت نسبتها تبعاً للمستخلص وتركيزه، وكذلك الفترة الزمنية. وكان مستخلص الثوم هو الأفضل يليه الزعتر، الشيح، ثم تفاح الشاي (الميرمية). كما أعطت ذات النتائج على البالغات بالإضافة إلى تثبيطها لعملية وضع البيض. كما تم اختبار أنظمة مختلفة من الإضاءة (LD، DD، LL) على فترة بقاء الحشرات البالغة وموتها وكذلك تأثيرها في كمية وضع البيض للأنثى. وباستقراء النتائج عن تأثير الإضاءة تحت الظروف المخبرية يمكن أن نستخلص أن لفترة الإضاءة تأثيرات معنوية إحصائياً في بعض الجوانب الحياتية (معدل وضع البيض، موت الحشرات البالغة) إذ تبين من خلال النتائج أن نظام الإضاءة المتبادل (LD) هو أكثر أنظمة الإضاءة المخبرية ملائمة لحياتية الحشرة حيث أعطت معدلات بيض معتدلة ونسبة موت منخفضة بعكس نظام الإضاءة المستمرة (LL).

EX 5

تأثير بعض منتجات النيم *Azadirachta indica* A. Juss في نمو وتطور دودة الشوندرالسكري/البنجر *Spodoptera exigua* (Hübner). منيف عبد مصطفى وزهير محمد الشاروك، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: mabid2005@yahoo.com

تمت دراسة تأثير منتجات النيم *Azadirachta indica* A. Juss في نمو وتطور يرقات دودة الشوندرالسكري/البنجر *Spodoptera exigua* (Hübner) على الغذاء الصناعي تحت ظروف الحاضنة. أظهرت النتائج أن كل من الساداوي ثاي III والأزادراختين A- والنيمك سوبر وزيت النيم، سببت انخفاضاً معنوياً في أوزان اليرقات والعداري، وقد بلغت قيم EC_{50} على التوالي، 0.47، 0.48، 1.0 و 1.9 جزء في المليون. وبينت النتائج أن التراكيز العالية من منتجات النيم، سببت موت في يرقات دودة الشوندرالسكري/البنجر. وكانت قيم LC_{50} على التوالي، 0.5، 0.6، 1.1 و 3.2 جزء في المليون. ونتج من جراء التأثيرات المختلفة لمنتجات النيم ظهور حالات من النمو غير الطبيعية وتشوهات مظهرية عديدة في أطوار الحشرة المختلفة. سوف يتم عرض النتائج المتضمنة أشكالاً وجداولاً.

EX 6

المستقبلات الحسية لبعوض *Aedes* و *Anopheles* ودورها في الإحساس بالمواد الطاردة. عيد الكريم عامر¹ وهانز ميلهورن². (1) جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني: a_m_amer@yahoo.com؛ (2) قسم الحيوان وبيولوجي الخلية والباراسيتولوجي بجامعة هاينرش هاين دويسلدورف، ألمانيا. هدفت هذه الدراسة إلى اكتشاف الدور الذي تلعبه بعض أعضاء جسم البعوضة في الإحساس بالمواد الطاردة. استخدم في التجربة 250 أنثى بعمر 15 يوماً من كل نوع من *Aedes aegypti* و *Anopheles stephensi*. قسمت الحشرات إلى خمسة مجموعات: المجموعة الأولى بدون قرون استشعار، المجموعة الثانية بدون بصيلات فكية، المجموعة الثالثة بدون خرطوم، المجموعة الرابعة بدون المخالب الأمامية، والمجموعة الخامسة إناث طبيعية كشاهد. واستخدم مخلوط مكون من خمسة زيوت (*Melaleuca quinquenervia* 1%، *Melaleuca leucadendron* 1%، *Litsea cubeba* 1%، *Nepeta cataria* 1% و *Viola odorata* 1%) مذابة في مستحضر مركب من 10% polyethylene glycol (PEG)، كحول 20%، ماء 50%. كذلك تم استخدام Bayrepel بنسبة 20% مذابة في نفس المستحضر السابق كشاهد في هذه الدراسة. أجري الاختبار برش 100 ميكروليتر من المادة الطاردة على مساحة معرضة 30 سم² من ذراع متطوع وتعرض لقفص يحتوي على مجموعة البعوض المستهدفة لمدة 3 دقائق يتم خلالها حساب النسبة المئوية للبعوض النازل والمتغذي. في حالة *Aedes aegypti* سجلت زيادة معنوية في نسبة النزول والتغذية في حالة بعض المجموعات الفاقدة لبعض أعضاء الجسم خاصة المجموعة الفاقدة للبصيلات الفكية، بينما في حالة *Anopheles stephensi* لم يكن واضحاً أي الأعضاء هو المسئول عن الإحساس بالمواد الطاردة.

EX 1

تأثير المركبات القلوانية البايروزيديّة لنبات قرن الغزال (*Ibicella lutea*) في الأداء الحياتي للذبابة البيضاء (*Bemisia tabaci*). ناصر المنصور¹، فوزي الزبيدي² وشيماء العبيدي³. (1) قسم البايولوجي، كلية العلوم، جامعة البصرة، العراق؛ (2) قسم البايولوجي، كلية العلوم، جامعة بغداد، العراق؛ (3) كلية الطب، جامعة بابل، العراق، البريد الإلكتروني: honeyqueen_fs@yahoo.com

تم دراسة تأثير المركبات القلوانية المستخلصة من نبات قرن الغزال (*Ibicella lutea*) في بعض معايير الأداء الحياتي للذبابة البيضاء (*Bemisia tabaci*). فقد تأثرت نسبة الوفيات بشدة وصلت إلى 100% في التركيزات 1 و 2%. تم فصل ثلاث مركبات قلوانية بواسطة تقنية الكروماتوغرافيا الرقيقة. وقد أظهرت نتائج رش هذه المركبات بأن لها تأثيراً قوياً في نسبة الوفاة لجميع أطوار دورة الحياة، التي وصلت إلى 100، 66.6 و 59.3% عند المركبات في الأطوار اليرقية الأولى والثانية والثالثة، على التوالي، بالنسبة للمركب الأول و 83.6، 57.6 و 46.6% في المركب الثاني، وكانت 7.3، 4.3 و 2.6% في المركب الثالث. أما نسبة الوفيات في العذارى فقد وصلت إلى 42.3 و 33.6 و 2.0% وفي البالغات وصلت إلى 87.0، 80.3 و 22.3% عند المركبات الأول والثاني والثالث، على التوالي. أما هلاك البيوض فقد بلغ 66.0، 62.3 و 4.6% عند ذات المركبات، على التوالي. تمت دراسة الخصائص الكيميائية والفيزيائية للمركبات المعزولة.

EX 2

تأثير مستخلص المركبات الفينولية لنبات قرن الغزال (*Ibicella lutea*) في بعض الجوانب الحياتيّة للذبابة البيضاء (*Bemisia tabaci*). فوزي الزبيدي، قسم علوم الحياة، كلية العلوم، جامعة بغداد، بغداد، العراق، البريد الإلكتروني: fawzi_alzubaidi@yahoo.com

درس تأثير المركبات الفينولية المستخلصة من نبات قرن الغزال (*Ibicella lutea*) في نسبة موت الذبابة البيضاء (*Bemisia tabaci*)، فأظهرت النتائج أن نسبة موتها بلغت 100% عند التركيزات 1 و 2%. كما تأثرت نسبة الموت التراكمية هي الأخرى وبلغت 100% عند ذات التركيزات. تأثر معدل تطور الحشرة في الأطوار غير البالغة حيث وصلت إلى 22.1 يوم عند التركيز 0.5% بينما بلغ عند الشاهد 12 يوماً. استخدمت تقنية كروماتوغرافيا الصفائح الرقيقة T.L.C لفصل المركبات الفينولية. وأظهرت هذه المركبات تأثيراً في معدل موت كل الأطوار غير البالغة لحشرة الذبابة البيضاء وتراوحت ما بين 27.3-38.3% في الطور اليرقي الأول عند استخدام مركبات 1، 2 و 3 وتراوحت ما بين 21.3-30% في الطور اليرقي الثاني وتراوحت ما بين 17.6-29.3% في الطور اليرقي الثالث. كما تأثرت نسبة فقس البيض، حيث تراوحت ما بين 24.3-33.3% لهذه المركبات المفصولة. وبلغت نسبة موت البالغات 52.6%، وأظهرت النتائج بأن المركبات المفصولة لها تأثيراً تضامنياً أكثر من تأثيرها منفردة.

EX 3

دراسة التحليل الكيماوي والتأثير السام للمستخلص الخام والمركبات المفصولة من النبات البري *Halocnemon strobilacium* في حشرة من العدس (*Aphis craccivora* Koch.). سميرة أحمد عبد الله¹، هاني محمود عاشور بدوي²، أحمد عبد السلام بركات² ومحمود محمد محمود سليمان¹. (1) قسم الأفات ووقاية النبات، المركز القومي للبحوث، القاهرة، مصر؛ (2) قسم الحشرات الإقتصادية والمبيدات، كلية الزراعة، جامعة القاهرة، مصر، البريد الإلكتروني: solim_nrc@yahoo.com

يعد نبات *Halocnemon strobilacium* من النباتات البرية المنتشرة بشكل كبير في أجزاء كثيرة من شبه جزيرة سيناء في مصر وهو يتبع الفصيلة المرامية. في هذه الدراسة تم استخلاص هذا النبات باستخدام بعض المذيبات العضوية المختلفة القطبية وتقييم سمية مستخلصات هذا النبات على حشرة من العدس (*Aphis craccivora*). وكان مستخلص الإيثيل اسيتيت الأكثر فاعلية على الآفة، ولذلك تم فصل وتعريف المكونات الفعالة للمستخلص الخام (Crude extract) والعزلات المفصولة منه. أوضحت النتائج أن المستخلص الخام كان أكثر فاعلية من المركبات المفصولة منه وكانت قيمة LC_{50} و LC_{95} 0.159 و 1.845 مغ/سم² مقارنة مع 1.299 و 3.899 مغ/سم² للمركب المفصول A و 1.522 و 4.721 مغ/سم² للمركب المفصول B. ووجد أن المكونات الرئيسة الفعالة للمستخلص الخام هي أحماض دهنية مشبعة وغير مشبعة واستراتها التي تشكل 68.99% من مكونات العينة، يليها الهيدروكربونات بنسبة 9.61%. ومن التربينات تم تعريف اثنتان هما الفيتول والداي تربين بنسبة 2.26%. وكان الحامض الدهني الأولييك هو المكون الأعظم في العينة بنسبة 38.18% وكذلك الحامض الدهني الاوكتاديكانويك بنسبة 16.4%. كما كان المركب Lumiflavine المكون الأساسي في المركب المفصول A إذ بلغت نسبته 35.66%. كذلك تم تعريف خمسة أحماض دهنية وكانت نسبتها جميعاً 39%، وبلغت نسبة

مستخلصات نباتية

بنك المعلومات للمبيدات في الجزائر. يمية دحون تشولاق، خديجة مريم موسوي ولحسن عبد لول، مختبر العلوم وتقنيات البيئة. المدرسة الوطنية المتعددة التقنيات، 10 شارع حسان بادي، ص.ب. 182، الحراش، الجزائر، البريد الإلكتروني: tchoulak_1999@yahoo.fr

تستعمل المبيدات في الزراعة لوقاية النبات والمحافظة على الإنتاج الفلاحي، لكن مفعولها السام يمكن أن يسبب تأثيرات على الصحة والبيئة، خاصة عند عدم مراعاة شروط استعمالها. عرفت الجزائر، كسائر البلدان النامية، ارتفاعاً في استعمال المبيدات خاصة بعد انفتاح السوق على المتعاملين الخواص، وحيث أن هناك نقص في المعطيات التقنية والعلمية حول طريقة استعمال هذه المواد ومفعولها على الصحة والبيئة، فإن ذلك قد شكل خطراً متزايداً على البيئة وصحة الإنسان. على هذا الأساس ومن أجل تعويض هذا النقص للمعطيات، أصبح من الضروري القيام بدراسة شاملة على أسس علمية حول استعمال المبيدات في الجزائر، وذلك من خلال اللقاءات الميدانية المباشرة مع المزارعين والبائعين، والقيام باتصالات مع جميع المؤسسات والأطراف المعنية. سمحت المعطيات المتحصل عليها بتزويد بنك المعلومات حول المبيدات في الجزائر بأقراص (CD/ROOM) لصالح مختلف المستعملين. تشمل هذه المعطيات على مختلف القوانين حول المبيدات، المبيدات المسموح تسويقها، المبيدات الأكثر استعمالاً، قواعد وشروط المتاجرة، احتياطات الاستعمال، حالات التسمم. يسمح هذا النظام المعلوماتي بفحص سريع وسهل للمعلومات حول المبيدات ويسهم في استعمالها بصورة صحيحة مع تقليل مخاطرها.

الهيماتوكريت، كرات الدم الحمراء، كرات الدم البيضاء، تركيز الكيرياتينين، تركيز اليوريا وأيضاً على نشاط أنزيم الأستيل كولين استيراز. ويمكن تليخيص النتائج فيما يلي: لم تحدث المعاملة بالجرعة تحت المميطة للمبيدات الحشرية الثلاثة المختبرة أي اختلاف معنوي في تركيز الهيموجلوبين مقارنة بالشاهد. بينما أحدثت المعاملة المتأخرة (اللاحقة) بالاتروبين زيادة مع جميع المبيدات المختبرة. أحدثت المعاملة بمبيدي كارباريل وفينثروثيون انخفاضاً غير معنوي في تعداد كرات الدم الحمراء بينما في حالة مبيد دلتاميثرين زاد تعداد كرات الدم الحمراء. أحدثت المعاملة بمبيد فينتروثيون زيادة معنوية في تعداد كرات الدم البيضاء بنسبة 27.6%، على عكس دلتاميثرين الذي أحدث خفضاً في تعدادها بنسبة بلغت 27.1%، مقارنة مع الشاهد. حدثت زيادة كبيرة في تركيز الكيرياتينين للمبيدات الحشرية الثلاثة المختبرة، وأيضاً زيادة معنوية في تركيز اليوريا. تسبب مبيد كارباريل وفينثروثيون في تثبيط قوي لنشاط إنزيم الأستيل كولين استيراز بلغ معدله 59.38% و 67.78%، على التوالي. لم يؤد التعرض لدلتاميثرين منفرداً لأي تأثير معنوي. أدت المعاملة المباشرة بالاتروبين إلى زيادة في نشاط الأنزيم مع المبيدات الحشرية الكارباماتية والفسفورية العضوية المختبرة بنسبة استرجاع بلغت 62.27% لمبيد كارباريل و 58.62% لمبيد فينتروثيون. حدثت ذات الظاهرة في حالة المعاملة المتأخرة بالاتروبين وكانت أكثر وضوحاً في حالة مبيد كارباريل.

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تأثر متبقيات المبيدات بنوع المحصول وآلة الرش المستخدمة. أحمد أحمد سلام¹، مصطفى عبد الحفيظ طنطاوي² وإبراهيم متولى النبراوي³. (1) قسم وقاية النبات، كلية الزراعة، جامعة جنوب الوادي، سوهاج، مصر، البريد الإلكتروني: asallam3@yahoo.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة الزقازيق، الزقازيق، مصر؛ (3) قسم الآفات ووقاية النبات، المركز القومي للبحوث، الدقي، جيزة، مصر.

تم تقدير متبقيات اثنان من المبيدات الفوسفورية العضوية البروفينفوس (السليكرون القابل للاستحلاب 72%) والبريمفوس-ميثايل (الأكتيك القابل للاستحلاب 50%) في ثمار الطماطم/البندورة والكوسا. كما درس أيضاً تأثير آلة الرش المستخدمة (المرش الآلي الظهري، الرشاشة الظهرية والمرشات الأرضية الآلية) في الكمية المتبقية من هذين المبيدات بعد الرش، ووضع في الاعتبار دراسة تأثير عمليتي الغسيل والتشهير على إزالة هذه المتبقيات. وأوضحت النتائج أن مقدار الراسب الأولي قد تأثر بقطبية المبيد المستخدم والخصائص المورفولوجية والكيميائية للسطح المستقل لسائل الرش (اسطح الثمار) وكذلك بطراز آلة الرش المستخدمة، وذلك من حيث تأثيرها في حجم قطرات الرش وتجانسها. وبمقارنة المترسب على نوع الثمار المعاملة وجد أن كمية المبيد الموجودة على ثمار الكوسا أعلى من تلك الموجودة على ثمار الطماطم/البندورة، وقد يعود ذلك إلى التباين في الخصائص المورفولوجية والكيميائية لنوعي الثمار. أما فيما يخص بطراز آلة الرش، فأوضحت النتائج أن كمية الراسب المتبقي على اسطح الثمار كان أكبر في حالة استخدام الموتور الظهري يليه الرشاشة الظهرية ومن ثم الموتور الأرضي. وقد يبرر هذا التباين بين هذه الطرز حجم قطرات الرش الخارجة من البشوري وكذلك قوة اندفاع سائل الرش. كما أظهرت النتائج أن متبقيات المبيدات الموجودة داخل وخارج الثمار تقل بمرور الوقت. وتباين نوعي الثمار في مقدرتها على أيض كل من المبيدات حيث أظهرت ثمار الكوسا قدرة أعلى من ثمار الطماطم/البندورة، إذ وجد أن الأيام الخمسة الأولى هي الفترة الحرجة حيث يتلاشى القدر الأكبر من المتبقيات. وأوضحت الدراسة أيضاً أن غسيل ثمار الطماطم/البندورة وتشهير ثمار الكوسا قبل الإستهلاك يؤدي إلى خفض المتبقيات مع الإختلاف في الكفاءة. وبلغت فترات الأمان لثمار الطماطم/البندورة والكوسا المعاملة بمبيد البروفينفوس قبل الجمع 5.5 و 7 يوم بينما بلغت في مبيد البريمفوس ميثايل 7.8 و 2.3 يوم. لذا يجب أن يسمح بشيء من التحفظ قبل قطف الثمار للإستهلاك الآمي بفترة لا تقل عن سبعة أيام من الرش.

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تصميم آلة ضخ تعمل على منظومة الهواء لتطبيق معاملة المبيدات تحت سطح التربة. عبد الرزاق عبد اللطيف جاسم، قسم المكننة الزراعية، كلية الزراعة، جامعة بغداد، وزارة التعليم العالي والبحث العلمي، العراق، البريد الإلكتروني: raz55iq@yahoo.com

توجد معدات مختلفة لرش الكيماويات الزراعية مثل الأسمدة السائلة والمبيدات، ولكن معظمها مصمم لتطبيق المواد على التربة أو النبات وليس تحت سطح التربة. لذلك، جاءت فكرة تصميم منظومة ميكانيكية تستعمل لرش أو ضخ الكيماويات تحت سطح التربة تعمل على منظومة هواء المحراث (التراكتور) الذي صمم لهذا الغرض وذلك لتفادي تلوث البيئة. تتكون المنظومة من خزان يرتكز على هيكل المحراث ويتصل به أنبوب مطاطي يرتبط بمنظومة هواء المحراث لغرض توليد ضغط لضخ المبيدات إلى جناحي المحراث عن طريق أنبوب يحتوي على صمام لانزال المبيدات، ويمتد في كل جناح أنبوب معدني يحتوي على مجموعة من الفتحات (nozzles) لتجزئ المحلول على شكل رذاذ لتغطية جميع مساحة خدمة المحراث بالمبيدات (العرض الفاعل للمحراث). وتستطيع هذه المنظومة رش الأسمدة السائلة أو أي مادة سائلة فوق أو تحت سطح التربة أيضاً وذلك عن طريق التحكم بأقطار المرشات.

أثبتت الزيوت الصفراء فاعليتها الفورية ضد بيوض *A. pomi* دون أن تؤثر في الأطوار المختفية لـ *P. ulmi*. وأوضحت نتائج تحليل العناصر المعدنية لأوراق التفاح عند بداية التجربة ونهايتها أن المعاملات الكيميائية لها تأثير في تركيز العناصر التالية: البوتاسيوم، المغنيزيوم، الفوسفور والكالسيوم. كما أن لهذه العناصر تأثير في التغيير العشائري للحشرات المدروسة. لوحظ بأن عشائر *A. pomi* متلازمة طردياً مع عنصر الفوسفور وعكسياً مع عنصر الكالسيوم، كما لوحظ أن البروتينات الذائبة والمنحلة في الماء ليس لها تأثير في عشائر *A. pomi*. وكان هناك تلازماً طردياً بين عشائر *P. ulmi* وكمية المغنيزيوم قبل وبعد إجراء المعاملات، بالرغم من أن نفس المعاملات الكيميائية أوضحت وجود تلازم عكسي بين كثافة عشائر *P. ulmi* والبروتينات المنحلة في الماء.

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مقارنة الكفاءة الحقلية للمبيدين *thiamethoxam* و *imidacloprid* عند استخدامهما في معاملة البذار أو رشاً لمكافحة بعض حشرات الفول والقمح والذرة في سورية. مدين قاسم¹، سمير عساف¹، أحمد إبراهيم¹، محمد إبراهيم²، عمران يوسف³ وحليم يوسف³. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية؛ (2) مركز بحوث حمص، الهيئة العامة للبحوث العلمية الزراعية، حمص سورية؛ (3) مركز البحوث العلمية الزراعية بالقامشلي، الهيئة العامة للبحوث العلمية الزراعية، القامشلي، سورية.

تم تقييم كفاءة المبيدين كروزيير FS 35% (*thiamethoxam*) وجاوشو W.S 70% (*imidacloprid*) في مكافحة من الفول (*Aphis faba*) على الفول في ريف دمشق وحمص في الموسم الزراعي 2005/2004 عند استخدامهما بطريقة معاملة البذار قبل الزراعة، بالمقارنة بالمبيدين أكتارا 350 غ/ل (*thiamethoxam*) وكونفيدور 200 غ/ل (*imidacloprid*) المستخدمان رشاً عند بدء الإصابة، تبعاً للتراكيز المنصوح بها لكل منهما. تم تسجيل عدد الحشرات الحية قبل المعاملة بيوم و 1، 2، 3، 4 و 5 أسابيع بعد الرش. في مركز بحوث القامشلي، اختبرت المعاملات السابقة نفسها في مكافحة ماضغة بادرات الحبوب (*Zabrus tenebrioides*) على القمح، وتم تسجيل عدد النباتات المصابة قبل الرش وبعد الرش بـ 2، 4، 6 و 8 أسابيع. واختبر المبيد كروزيير مقارنة بالشاهد على نطاق أوراق الذرة (*Zygnidia scutellaris*) في حقول الذرة في ريف دمشق خلال الموسم الزراعي 2005/2004، وتم تسجيل عدد الأوراق المصابة بعد شهرين من الزراعة. أظهرت كافة معاملات البذار المختبرة كفاءة عالية في مكافحة من الفول تراوحت ما بين 99.7-99.9% في دمشق مقارنة بـ 85.7-99.6% للمبيدين القياسيين رشاً، و 98.2-99.8% في حمص مقارنة بـ 93.8-99.3% بطريقة الرش. تراوحت كفاءة معاملي البذار على ماضغة بادرات الحبوب في القامشلي ما بين 97.6-100% مقارنة بـ 76.2-94.5% في معاملي المبيدين القياسيين بطريقة الرش وعلى نطاق أوراق الذرة 95.9% في دمشق، ولم تظهر المبيدات المختبرة أية سمية نباتية على نباتات القمح، الفول والذرة.

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دراسة حقلية لتأثير مبيد "جاوشو" في حشرات المن التي تصيب نبات التبغ. فداء شمسين، توفيق ناصر، عماد إسماعيل، ماهر مصري، المؤسسة العامة للتبغ، دائرة الأبحاث في جب حسن، فرع المنطقة الساحلية، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: kaisgazal@shufbc.com

تمت دراسة تأثير المبيد "جاوشو" في وقاية نباتات التبغ من الإصابة بحشرات المن. عوملت بذور التبغ تعفيراً بالمبيد بمعدلين مختلفين 0.2 و 0.4 غ مبيد/غ بذور. وبعد شتل التبغ في الحقل رُشت النباتات رشتين إضافيتين بالمبيد وبالمعدلين السابقين. كانت الرشوة الأولى بعد شهر من الشتل، وجاءت الرشوة الثانية بعد شهر من الأولى. أوضحت النتائج أن تعفير البذور بالمبيد بالمعدلين المذكورين قد أمن حماية للشتل من حشرات المن لمدة شهرين مقارنة بتجربة الشاهد. خفض الرش الإضافي بالمبيد (معدل 0.2 غ/غ) على نباتات التبغ في الحقل أعداد حشرات المن بنسبة 80% مقارنة بتجربة الشاهد، في حين انخفضت أعداد حشرات المن بنسبة 90% عند استخدام الرش الإضافي بمعدل 0.4%.

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مقارنة التغييرات البيوكيميائية في الفئران المعرضة لبعض المبيدات عند وجود أو غياب ترياق الأتروبيين. السيد أحمد محمد عبد الله¹، ياسر أبو بكر²، فهمي أحمد قاسم¹، عزت أمين قادوس¹ وناصر بدوي شرقاوي¹. (1) قسم كيمياء المبيدات، كلية الزراعة، الاسكندرية، مصر؛ (2) قسم بحوث الحيوانات الضارة بالزراعة، معهد وقاية النبات، مركز البحوث الزراعية، مصر، البريد الإلكتروني: elsayedabd2004@yahoo.com

درست مجموعات من فئران التجارب للمعاملة تحت الجلد بالجرعة تحت المميطة لكل من كارباريل، فنيثروثيون وديلتاميثرين، وأيضا للمعاملة المباشرة والمتأخرة بالأتروبيين. تم دراسة أثر المعاملات على تركيز الهيموجلوبين،

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تقيم فاعلية بعض المبيدات المختارة على المجموع الحشري لكل من دودة اللوز الأمريكية ودودة قرون اللوبياء التي تصيب اللوبياء في الأراضي حديثة الاستصلاح. جيهان يوسف عبده والسعيد فواز عبد الله، قسم آفات ووقاية النبات، المركز القومي للبحوث، ص.ب 12622، الدقي، مصر، البريد الإلكتروني: Gegeabdou@yahoo.com

تعذ حشرنا دودة اللوز الأمريكية (*Helicoverpa armigera* Hubner) ودودة قرون اللوبياء (*Etiella zinckenella* Treitschke) من أكثر الآفات ضرراً للعديد من المحاصيل البقولية في مصر. أجريت تجارب حقلية لتقييم كفاءة بعض المركبات الأمانة نسبياً وبعض المبيدات التقليدية في مكافحة الأفتين على اللوبياء تحت ظروف المناطق المستصلحة حديثاً. بينت النتائج قدرة معظم المعاملات الكيميائية في خفض مستويات الإصابة بدرجات مختلفة تبعاً لطبيعة المركب المختبر وعدد مرات استخدامه. فالمعاملة بالمركبات غير التقليدية مثل thiamethoxam أو indoxacarb أحدثت خفضاً معنوياً في التعداد اليرقي بنسبه 75-70% لدودة اللوز الأمريكية وبنسبة 57-56% لدودة قرون اللوبياء لكلا المركبين، على التوالي. أما المعاملة بالمبيد methoxyfenozide، فقد أظهرت أيضاً نتائج مرضية ضد يرقات دودة اللوز الأمريكية (حوالي 60% خفضاً في الإصابة) بينما نشاطاً ضعيفاً (لم يتعدى 20%) ضد يرقات دودة قرون اللوبياء. ومن ناحية أخرى هناك مبيدات أكثر تأثيراً على كلتا الحشرتين فاستخدام chlorpyrifos أو cypermethrin عملاً على خفض الإصابة بنسبة 73-80%. وتشير النتائج أيضاً أن جميع المبيدات المختبرة لها تأثير باق منخفض، ولذا فتكرار الرش أسبوعياً يعد ضرورياً لحماية النباتات من أية إصابات حشرية جديدة. كما أن المعاملة 6 مرات طوال موسم النمو أدى إلى خفض الضرر الناتج عن الإصابة الحشرية بصورة أفضل مقارنة بالمعاملات الأخرى التي تم رشها مرتين أو أربعة مرات. وعند الحصاد انعكس تأثير هذه المعاملات على الإنتاجية، وكان المحصول الناتج من 6 معاملات يفوق المحصول الناتج من المعاملات الأقل تكراراً، وقد ازداد المحصول بنسبة 46.9% مقارنة بالشاهد عند المعاملة بالمبيد chlorpyrifos يليه thiamethoxam، indoxacarb و cypermethrin (38.8%) لكل منهما، وأخيراً methoxyfenozide (33.9%). وقد صاحب ذلك ارتفاع ملحوظ في نسبة الحبوب الثالفة، وبلغت 28% في المعاملات التي أجريت مرتين فقط طوال الموسم، بينما كان مستوى الضرر في الحبوب محصوراً بين 13.6 و 16.4% في حالة المعاملات التي طبقت ست رشات طوال الموسم. ويمكن القول أن كفاءة هذه المركبات الحديثة ومدى ثباتها المناسب على النباتات المعاملة، بالإضافة إلى قلة سميتها على الثدييات تجعل منها مواداً واعدة في مكافحة عند استخدامها منفردة أو مع طرائق المكافحة الأخرى على نباتات اللوبياء.

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التغيرات الإنزيمية بسلاطات من القطن المقاومة للمركبات الفوسفورية العضوية. همام بخيت همام، محمد إبراهيم شديد وحامد عبد الدايم محمد، معهد بحوث وقاية النباتات، شارع نادي الصيد، الدقي، جيزة 12618، مصر، البريد الإلكتروني: dr_homam@hotmail.com

تم تعريض بالغات من القطن (*Aphis gossypii*) للضغط الانتخابي بمبيد الملاثيون (المجموعة الفوسفورية العضوية) لمدة 15 جيلاً للحصول على سلالة مقاومة لدراسة دور نشاط الكربوكسيل إستراز في تطور ظاهرة المقاومة للمجموعة الفوسفورية العضوية. تم غربلة خمسة مواد تفاعل إنزيمي (خلات الألفا نافتيل، خلات الأندوكسيل، خلات الليورات، خللات المرستيت وأسيتيل ثيوكلين أبويد) لتحديد أنسبها في قياس النشاط الإنزيمي الإستريزي. أوضحت النتائج أنه يمكن قياس هذا النشاط بواسطة خللات الألفا نافتيل، خللات الأندوكسيل، وأنه يمكن أن يستخدموا في تحديد مستوى المقاومة، وكدلالة (شاهد) لمقاومة المبيدات الفوسفورية العضوية في عشائر من الحقلية. ومن ناحية أخرى فقد صنفت الروابط 1، 3 و 6 على أنها كربوكسيل إستراز في السلالة المقاومة. وقد تساعد هذه النتائج في تحسين إستراتيجية إدارة المقاومة للمركبات الفوسفورية العضوية.

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تأثير المعالجات الصحية النباتية في نوعية مكونات أوراق التفاح وفي تباين تغلب عشائر حلم *Panonychus ulmi* Kock والمن *Aphis pomi* De Geer في بساتين سهل متيجة (الجزائر). زهر الدين جازولي¹، بهية دومانجي² وسهام زيوش¹. (1) مختبر علم الحيوان الزراعي والغابي، كلية الزراعة والبيطرة، جامعة سعد حلب البلدة، ص ب 270، الدوريات، البلدة، الجزائر، البريد الإلكتروني: zahr2002@yahoo.fr؛ (2) المعهد الوطني الزراعي، الحراش، الجزائر، البريد الإلكتروني: doumandjimitiche@yahoo.fr

أجرى تقييم لكفاءة المبيد الحشري Ultracide 40 والزيوت الصفراء تجاه بعض آفات التفاح وتأثيراتها الجانبية في مكونات أوراق التفاح بأحد بساتين سهل متيجة، الجزائر. أوضحت النتائج المتحصل عليها أن المبيد الحشري Ultracide 40 فعال ضد حلم (*Panonychus ulmi* (Arachnida: Tytranychidae)) والمن (*Aphis pomi* (Homoptera: Aphididae)). بينما

أظهرت منظّمات النمو Cascade، Nomolt و Match فاعلية جيدة في مكافحة الحفار، وأظهرت المبيدات الحيوية thuricide HP و Delfin فاعلية ابدية جيدة ضد هذه الآفة. أظهرت النتائج أن استخدام تقانة معاملة البذور باستعمال مبيدي كروزر ومارشال وفرت حماية نسبية للنبات من الإصابة بحفار ساق الذرة، كما أنها أعطت المحصول نمواً جيداً وزيادة في الإنتاجية.

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تأثير بعض المبيدات على الأجسام الدهنية للذبّاب المنزلي *Musca domestica* L. كريم محمد أحمد¹، طلال طاهر محمود² وعبد الباسط محمد أمين محمد³. (1) قسم صحة المجتمع، كلية تقنية السليمانية، هيئة التعليم التقني، العراق، البريد الإلكتروني: savo1996@yahoo.com، dr_amin57@hotmail.com؛ (2) قسم الغابات، كلية الزراعة، جامعة دهوك، العراق؛ (3) قسم وقاية النبات، كلية الزراعة، جامعة صلاح الدين، العراق.

اجري هذا البحث لدراسة تأثير 4 مبيدات [Thiamethoxam (Actara)، Malathion (Vapmalathion)، Deltamac (Deltamethrin) و (Icon) Lambda-cyhalothrin] على الأجسام الدهنية لبالغات الذبّاب المنزلي (*Musca domestica* L.) تحت الظروف المختبرية (درجة حرارة 25-27 °س، رطوبة نسبية 40-50% و 12 ساعة اضاءة)، وذلك باستخدام ثلاثة تراكيز من كل مبيد (منخفض، متوسط وعالي). أشارت النتائج المتحصّل عليها بأن تركيب الأجسام الدهنية قد تغير تبعاً للتركيز المستخدم، حيث سببت التراكيز المنخفضة للمبيدات المختبرة (0.78، 75.0، 4.75 و 15.0 جزء بالمليون، على التوالي) ظهور فجوات مع تحبب السيترولازم. أما التركيز المتوسط (1.56، 150.0، 9.5 و 30.0 جزء بالمليون، على التوالي) فقد تسبب في ظهور مراحل مختلفة من تحلل وهدم جزيئات السيترولازم. في حين سبب التركيز العالي (3.12، 300.0، 19.0 و 60.0 جزء بالمليون، على التوالي) تلف شديد للخلايا الدهنية أدى لانفجارها في النهاية.

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سلوك متبقيات مبيد الأوكساميل في التربة المزروعة بنبات البندورة/الطماطم. محمد جمال الحجار وريتنا منصور، قسم الوقاية، كلية الزراعة، جامعة دمشق، دمشق، سورية، البريد الإلكتروني: hajjar-j@scs-net.org تمت دراسة سلوكية مبيد الأوكساميل (10G) في التربة المزروعة بنبات البندورة/الطماطم تحت الظروف الحقلية (عروة صيفية) خلال فترة زمنية امتدت إلى ثلاثة أسابيع بعد تطبيق المبيد بالمعدل المنصوح به من قبل الشركة المصنعة (10-30 كغ/دونم). تم تقدير متبقيات المبيد في عينات الأوراق والثمار والتربة على عمقي 0-10 سم و 30-40 سم كما ونوعاً باستخدام جهاز الكروماتوغرافيا السائلة عالية الأداء (HPLC) المزود بكاشف الأشعة فوق البنفسجية (UV) عند طول موجه 233 نانومتراً. أشارت نتائج التحليل إلى أن مبيد الأوكساميل يتمتع بحركة عالية ضمن طبقات التربة كونه مبيد عالي الذوبانية في الماء. وقد اختلفت مستويات المتبقيات في التربة بين العمق 0-10 سم و 30-40 سم. كما أشارت نتائج التحليل إلى الفاعلية الجهازية العالية لمبيد الأوكساميل إذ انتقل من التربة إلى الأوراق وتواجد فيها بتراكيز عالية تصل إلى 5.1801 مغ/كغ. أما في الثمار فقد وجد أن كمية البقايا خلال فترة التجربة لم تتغير مع الزمن وكانت تتراوح ما بين 0.1-0.2 مغ/كغ وهي أقل من قيمة الحد الأقصى المسموح به من المبيد (2 مغ/كغ).

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مبيدات الآفات- الأسمدة وعلاقتها بمحصول القطن: 1- التأثيرات في الإصابة بديدان اللوز وإنزيمات التربة. حمدي أمين عوض ومحمد سعيد الشحات، محطة بحوث وقاية النباتات، مركز البحوث الزراعية، الإسكندرية، مصر، البريد الإلكتروني: ayten999@yahoo.com

أعدت دراسة حقلية على القطن صنف جيزة 70 لمدة موسمين زراعيين في محافظة الإسكندرية، مصر، لتقييم تأثير بعض مبيدات الآفات في درجة الإصابة بديدان اللوز ونسبة الفقد في اللوز وكذا تأثيراتها في إنزيمي الديهيدروجينيز واليورينيز في التربة. تم تطبيق المبيدات في نظامين، فردياً وفي نظام ترتيب تعاقبي (دورسبان- كاراتي لامباداسيهالوثرين- لارفن كارب) وذلك تحت نظامين من التسميد (سماد معدني NPK، ونصف جرعة السماد المعدني مع سماد حيوي ميكروبي). أوضحت النتائج المتحصّل عليها أن مبيد اللارفن (ثيوديكارب) أقل المبيدات فاعلية ضد ديدان اللوز إذ سبب نسبة خفض للإصابة حوالي 76.64%. وأن كفاءة المبيدات كانت أعلى عند استخدام السماد الحيوي مع السماد المعدني (89.1%)، مقارنة مع استخدام السماد المعدني فقط (81.7%) وذلك خلال الموسم الأول الذي لا يختلف جوهرياً عن الموسم الثاني. بلغت نسبة الخسارة في اللوز عند نهاية الموسم 6.32% مع السماد المعدني، و 3.18% مع نصف السماد المعدني والسماد الحيوي بعد الموسم الأول. بينما كانت القيم 6.46 و 5.92% في الموسم الثاني، على التوالي. ومن ناحية أخرى سببت المبيدات خفضاً جوهرياً لنشاط أنزيمي الديهيدروجينيز واليورينيز في التربة، وأنه لم يكن هناك تأثير باختلاف نوع التسميد.

P 10

تأثر متبقيات البروفينوفوس والكاربوسلفان في قرون اللوبياء الخضراء بإضافة المواد المساعدة. محمد حسن عبد الرحمن سليمان¹ أحمد السيد عمر² وعطا علي شلبي². (1) معهد بحوث وقاية النباتات، شارع نادي الصيد، الدقي، الجيزة، مصر؛ (2) كلية الزراعة، جامعة الزقازيق، مصر، البريد الإلكتروني: dr_homam@hotmail.com

يهدف هذا العمل لدراسة تأثير إضافة الغراء، هامادول أيه 600 والايمولجيتور كمواد مساعدة في مستوى متبقيات البروفينوفوس والكاربوسلفان على قرون اللوبياء الخضراء. بينت النتائج أن المستوى المتبقي في القرون كان مرتفعاً في حالة البروفينوفوس مقارنة بالكاربوسلفان، وكذلك عند إضافة أي من المواد الثلاثة المساعدة للبروفينوفوس. أوضحت النتائج أيضاً أن المعدل الموصى به من البروفينوفوس والكاربوسلفان مع الغراء قد أعطى كمية مرتفعة للمتبقيات الأولية بعد الرش مباشرة. ومن ناحية أخرى كان معدل الإختفاء أسرع في معاملات البروفينوفوس مقارنة مع معاملات الكاربوسلفان.

P 11

دراسة تأثير مبيدات *Sumialpha*^{5EC} و *Comply*^{25WP} و *Agerin*^{6.5WP} في حفارات ساق الذرة الصفراء. رضوان ياقتي¹، كريستيان بورجه مايستر²، محمد وليد ادراوا¹ وإبراهيم الجوري¹. (1) قسم وقاية النبات، كلية الزراعة الثانية، دير الزور، ص.ب. 358، سورية، البريد الإلكتروني: Jouri@myway.com؛ (2) معهد أمراض ووقاية النبات، جامعة هانوفر، ألمانيا الاتحادية.

تعد حفارات ساق الذرة الصفراء من جنس *Ostrinia* و *Sesamia* من أخطر الآفات على محصول الذرة الصفراء، وتتمثل أضرارها بحفر الأنفاق في السوق والكيان مسببة نقصاً كبيراً في غلة المصول ونوعيته. ويعد هذا البحث الأول من نوعه في المنطقة الشرقية من سورية خلال عامي 2004 و 2005 إذ حاولنا تطبيق بعض المبيدات (*Comply* و *Sumialpha* و *Agerin*) في مكافحة هذه الحفارات. أظهرت النتائج أن متوسط نسبة إصابة السوق في معاملة الشاهد بلغ 38% و 18.5% في الكيزان. وقد أبدت المبيدات *Sumialpha*، *Comply* و *Agerin* كفاءة عالية في خفض متوسط نسبة الإصابة، حيث بلغت في السوق 8.1، 13.5 و 21.2%، وفي الكيزان 6.1، 7.9 و 11.1%، على التوالي، الأمر الذي انعكس إيجاباً على زيادة الغلة الحبية لمحصول الذرة الصفراء.

P 12

فاعلية بعض المبيدات الحشرية في يرقات دورة ورق القطن (*Spodoptera littoralis* (Boisd.)). عادل جميل حورية¹ وميمون الجبل². (1) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، سورية؛ (2) مركز البحوث الزراعية، طرطوس، سورية، البريد الإلكتروني: emma75@maktoob.com

تعد دورة ورق القطن من أهم الحشرات الضارة بالبندورة/الطماطم في الزراعة المحمية على الشاطئ السوري. وقد اختبرت مخبرياً وضمن البيت البلاستيكي فاعلية أربعة مبيدات حشرية من مجموعات كيميائية مختلفة هي اندوكسكارب (أفونت 15%)، سبينوساد (تريسر 22.8%)، ميثوميل (لانيت 90%) وسبيرمثرين (سبيركل النصر 25%) ضد يرقات دودة ورق القطن في العمرين الأول والثاني كمجموعة وفي العمرين الثالث والرابع كمجموعة أخرى. بينت نتائج الدراسة المخبرية تفوق المبيد أفونت (0.025% مادة فعالة) بقتل يرقات العمرين الأول والثاني بنسبة 88.9% ويرقات العمرين الثالث والرابع بنسبة 83.3%. بينما أدت المبيدات تريسر (0.05% مادة فعالة) ولانيت (0.05% مادة فعالة) وسبيركل النصر (0.025% مادة فعالة) إلى قتل يرقات العمرين الأول والثاني بنسبة 66.7، 61.1 و 55.6% على التوالي. كما أظهرت نتائج تجربة البيت البلاستيكي فاعلية مماثلة تقريباً لما وجدت عليه المبيدات في المختبر، وقد تفوق المبيد أفونت (0.025% مادة فعالة) أيضاً على المبيدات الأخرى. ولم تلاحظ أية سمية نباتية.

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استخدام تقانة معاملة البذور في حماية محصول الذرة الصفراء من الإصابة بحفار ساق الذرة *Sesamia cretica* Led. وتحسين نموه. عبد الستار عبد الله الخفاجي وتضامن اسكندر، الهيئة العامة للبحوث الزراعية، بغداد، العراق، البريد الإلكتروني: sautalhamam@yahoo.com

اجريت سلسلة من الإختبارات الحقلية في محطة بحوث أبي غريب للمدة بين عامي 1999-2001 لدراسة كفاءة المبيد cruiser بجرع مختلفة لتوفير الحماية النسبية لمحصول الذرة الصفراء من الإصابة بحفار ساق الذرة *Sesamia cretica* Led. واختيار الجرعة الأفضل لمقارنتها بمسحضرات كيميائية مختلفة شملت منظمات نمو ومبيدات حيوية كما تم مقارنة فاعلية المبيد cruiser مع مبيدي Lesak و Marshal باستخدام نفس التقانة (معاملة البذور). وأظهرت النتائج أن المبيدين كروزر ومارشال قد وفرا حماية نسبية للنبات من الإصابة الحشرية وكان استعمالهما بديلاً عن الرش الكيماوية الأولى. كما

P 7

فاعلية بعض المبيدات الحيوية في مكافحة دودة تمر الواحات (*Ephestia calidella*) التي تصيب نخيل التمر في محافظة الوادي الجديد مصر. جمال الدين قرمان، قسم وقاية النبات، كلية الزراعة، جامعة المنيا، المنيا، مصر، البريد الإلكتروني: radwakaraman@yahoo.com

تم تقييم فاعلية ثلاثة من المواد الحيوية لمكافحة دودة تمر الواحات (*Ephestia calidella*) التي تصيب نخيل التمر في مصر. تم استخدام اثنين من المنتجات الحيوية البكتيرية، الأول يحتوي على 16 ألف وحدة دولية من بكتريا *Baccillus thuringiensis* var. *alesti* المعروف بـ "الديبل"، والثاني يحتوي على 32 ألف وحدة دولية من بكتريا *B.thuringiensis* var. *kurstaki* والمعروف بالدفنز. المادة الثالثة هي سبينوساد (تريسر 24 أس سي) وهو منتج حيوي خليط من جنس البكتريا *Actinomycete* وفطر الخميرة *Saccaropolyspora spinosad*. أوضحت النتائج المتحصل عليها أن مادسبينوساد كانت أفضل المنتجات المستخدمة إذ أعطت نسبة خفض للإصابة بالأفة تصل في المتوسط إلى 93.18% خلال عامي الدراسة، بينما حقق المنتجين الآخرين متوسطا عاما يصل إلى 72.10% في حالة الدلفن و 61.60% في حالة الديبل. كما تبين عدم وجود تأثيرات جانبية ضارة على الثمار بعد المعاملة بأي من هذه المنتجات كما أنها جميعا ذات تأثير فعال تحت ظروف الجو الجاف والحرارة المرتفعة.

P 8

التأثيرات السمية في البيض والتكاثر لبعض مثبطات تخليق الكيتين ضد دودة اللوز الشوكية. محمد إبراهيم عبد المجيد، سيد دحروج، جمال حجازي ومنى باطة، قسم وقاية النبات، كلية الزراعة، جامعة عين شمس، شبرا الخيمة، القاهرة، مصر، البريد الإلكتروني: m_mageed@yahoo.com

أجري هذا العمل بغرض دراسة التأثيرات السمية في البيض والتكاثر لبعض مثبطات تخليق الكيتين ضد دودة اللوز الشوكية. أوضحت النتائج أن التأثير السام في البيض يختلف باختلاف الطبيعة الكيميائية للمركب المختبر والتركيز المستخدم وعمر البيض المعامل. بالنسبة للبيض من عمر يوم واحد كان مبيد الهكسافلوميرون أكثر المبيدات المختبرة كفاءة يليه الكلورفليزرون والفلوفنوكسيرون على الترتيب، إذ بلغت قيم التركيز النصفى القاتل 285، 600.7 و 975.2 جزء في المليون، على التوالي. وبناء عليه فإن دليل السمية المبني على قيمة التركيز النصفى القاتل لأكثر المركبات المختبرة كفاءة (هكسافلوميرون = 100) بلغ 47.4 و 29.2 في حالة الكلورفليزرون والفلوفنوكسيرون، على التوالي. وتأكدت ذات النتائج مع البيض من عمر 2 يوم مع ظهور تحمل أكبر إزاء مثبطات تخليق الكيتين المختبرة مقارنة بالبيض عمر يوم واحد. ويختلف التأثير المتأخر في القدرة التناسلية لإناث فراشات دودة اللوز الشوكية تبعا لطبيعة المركب الكيميائي وعمر البيض المعامل. وعموما أظهر مركب الكلورفليزرون تأثيرا واضحا يليه الفلوفنوكسيرون، بينما كان مركب الهكسافلوميرون أقل المركبات المختبرة كفاءة. وقد أظهر البيض المعامل عمر 2 يوم حساسية أعلى في خفض القدرة التناسلية للحشرة مقارنة بالبيض المعامل من عمر يوم واحد. وزاد معدل إمتصاص البيض في بطن الإناث المعاملة بعد الموت كنتيجة لتأثير مثبطات تخليق الكيتين عند مقارنتها بإناث الفراشات غير المعاملة.

P 9

تأثير بعض المبيدات الحشرية في الأطوار غير كاملة للذبابة البيضاء (*Bemisia tabaci*) وطفيلياتها في حقول الفاصولياء. عبد الغني محمود السيد ومحمد إبراهيم شديد، معهد بحوث وقاية النباتات، الدقي، الجيزة، مصر، البريد الإلكتروني: dr_homam@hotmail.com

في تجارب حقلية تم فحص تأثير فاعلية أربعة مبيدات حشرية (25% Diathenuron، 20% Dinotefuron، 50% Chlorpyrifos methyl و 25% Carbosulfan) ضد الأطوار الغير كاملة للذبابة البيضاء التي تصيب نباتات الفاصولياء، والطفيليات التي تهاجم اليرقات والعداري. أوضحت النتائج أنه بعد إجراء الرش الثانية وفي اليوم السابع بعد الرش كان تأثير المبيدات أقل مما حدث في الرش الأولى، إذ تراوحت نسبة الإنخفاض في تعداد البيض بين 14-44% و 65-91%، على التوالي. حدث انخفاض معنوي واضح في تعداد اليرقات والعداري بعد إجراء المعاملات بالمبيدات خاصة في الرش الأولى حيث بلغ الإنخفاض في اليوم السابع بعد الرش إلى 69-93%، وفي الرش الثانية بلغ الإنخفاض في التعداد إلى 65-72%. تأثرت نسبة التطفل على اليرقات والعداري على أثر المعاملات الكيميائية بعد الرش الثانية وذلك مقارنة بالأجزاء الغير معاملة بالمبيدات.

P 4

كفاءة بعض المبيدات الفطرية والأحماض العضوية في مكافحة التفحم المغطى على القمح. سليمان عبد الله عمر¹، عمران يوسف²، حليم يوسف² وعبد الرزاق الناقوح³. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية. دوما، ص. ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarpartect@mail.sy؛ (2) مركز البحوث العلمية الزراعية بالقامشلي، الحسكة سورية؛ (3) مركز البحوث العلمية الزراعية في الغاب، حماة، سورية.

نفذت تجارب حقلية في مركزي بحوث القامشلي (بعل) والغاب (سقي) للموسمين الزراعيين 2003/2002 و2004/2003 باستخدام ثلاثة من المعقمات الفطرية (0.1% Dividend، 0.2% Vitaflo و 0.2% Vitaflo) ونوعين من الحموض العضوية (حمض اللبن وحمض الخل بتركيزين 0.20 و 0.30% لكل منهما)، وذلك لتقييم كفاءتها في مكافحة مرض التفحم الأسود على بذور القمح الطري صنف شام 4. حيث أحدثت العدوى الاصطناعية بمزيج من الفطرين *Tilletia laevis* و *T. tritici* بنسبة 1:1 وبمعدل 2 غ أبواغ/ 1 كغ بذار قمح. بينت النتائج تفوق المعقمات Dividend و Bremis وحمض اللبن بمعدل 0.30% على المعقم Vitaflo، وحمض اللبن بمعدل 0.20% وحمض الخل بالمعدلين 0.2 أو 0.3% في كلا الموقعين ولكلا الموسمين. أعطى حمض اللبن فاعلية جيدة في مكافحة مرض التفحم الأسود المغطى إلا أن تركيزه العالي أثر في حيوية الحبوب. أدى المعدل العالي لحمض اللبن إلى تأخير الإنبات، وخفض نسبة الإنبات إلى 70% في موقع القامشلي و90% في موقع الغاب، وإلى 80% باستخدام حمض اللبن بمعدل 0.20% في القامشلي.

P 5

التأثير الجانبي لبعض المبيدات الفطرية على البكتريا المثبتة للنيتروجين لاكتافيا. منير عباس عبد العزيز، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجزيرة، 9 ش جامعة القاهرة، ص. ب. 12619، مصر.

أجري هذا البحث في الصوبة لدراسة تأثير معاملة حبوب القمح بالمبيدات الفطرية في البكتيريا التي تقوم بتثبيت الأزوت الجوي في التربة وكذلك تأثيرها في نمو النباتات، وتمت معاملة حبوب القمح بمعدلين من كل من المبيدات الفطرية المستخدمة، وهي: Sumi-eight 5% EC (1 سم³ و 5 سم³/كغ حبوب) و Premis 2.5% FS (2 سم³ و 10 سم³/كغ حبوب)، بينما كانت التراكيز المستخدمة من المبيدين Sumi-eight 2% WP و Vitavax 200 75% WP لمعاملة حبوب القمح هي 2 غ و 10 غ/كغ حبوب. أظهرت النتائج أن مبيدي Sumi-eight WP و Sumi-eight EC كانت أفضل المبيدات المستخدمة في زيادة أطوال والوزن الجاف لنباتات القمح مقارنة بالمبيدات الأخرى ومعاملة المقارنة. كما لوحظ أن مبيد Vitavax WP كان أكثر المبيدات سمية لنباتات القمح، وقد أدى استخدامه إلى خفض أطوال والوزن الجاف للنباتات بصورة واضحة خاصة عند المعدل العالي للاستخدام بالمقارنة مع المبيدات الأخرى والشاهد، بينما وجد أن مبيد Premis FS ليس له تأثير ضار على أطوال والوزن الجاف للنباتات إلا عند استخدامه بالمعدل العالي (10 سم³/كغ حبوب). وكان المبيد Sumi-eight EC أفضل المعاملات تأثيراً في زيادة المحتوى النيتروجيني للنباتات تلاه مبيد Sumi-eight WP، بينما كانت المبيدات Vitavax و Premis الأكثر ضرراً، وانخفض المحتوى النيتروجيني للنباتات بدرجة كبيرة خاصة عند استخدامهما بالمعدل العالي لكل منهما. وبينت النتائج أيضاً انخفاض نشاط أنزيم النيتروجيناز في تربة منزرعة بحبوب معاملة بأحد المبيدين Vitavax و Premis خاصة عند استخدامهما بالمعدل العالي لكل منهما، في حين أدى استخدام كل من المبيدين Sumi-eight EC و Sumi-eight WP إلى زيادة نشاط أنزيم النيتروجيناز مقارنة بالمبيدات الأخرى ومعاملة الشاهد. وأدت معاملة الشاهد (المنزرعة بحبوب غير معاملة بالمبيدات) إلى زيادة نمو النباتات والمحتوى النيتروجيني لهذه النباتات وكذلك زيادة نشاط أنزيم النيتروجيناز في التربة.

P 6

تأثير المعاملة ببعض المبيدات في الكثافة العددية لدودة جوز القطن الشوكية (*Earias insulana*) وكمية الحاصل من القطن الزهر تحت الظروف الحقلية. سالم جميل جرجيس ونبيل مصطفى الملاح، قسم وقاية النبات، كلية الزراعة والغابات جامعة الموصل الموصل، العراق، البريد الإلكتروني: nbi_mstf@yahoo.com

نفذت الدراسة في موسم 2003 في منطقة الكوير (محافظة نينوى) بقطعتين من الأرض بمساحة متساوية. تم معاملة القطعة الأولى بالمبيدات من خلال برنامج للرش المتعاقب لثلاث مبيدات هي الكوتفيدور 20%، ميداميك 1.8%، والاندوسلفان 35%، في 2003/8/25 (بداية نشاط الحشرة) و2003/9/20 و2003/10/10، في حين تركت القطعة الثانية دون معاملة واستخدمت كشاهد للمقارنة. أدى برنامج الرش الحقلية بالمبيدات الثلاث الأنفة الذكر إلى خفض واضح في أعداد يرقات عثة جوز القطن الشوكية، إذ بلغت في نهاية الموسم 3 يرقات/100 جوزة، في حين أن أعداد هذه اليرقات في تجربة الشاهد كانت 82 يرقة/100 جوزة. كما أوضحت الدراسة أن إنتاجية الدونم الواحد من القطن الزهر عند المعاملة بالمبيدات بلغت 1290.84 كغ/دونم في حين بلغت هذه الإنتاجية 818.92 كغ/دونم في تجربة الشاهد.

P 1

كفاءة تراكيز مختلفة من المبيد الفطري Lamardor FS في مقاومة مرض التفحم الشائع في محصول القمح. عماد المعروف، فارس فياض وسفيان عبد الله، قسم أمراض النبات، دائرة البحوث الزراعية وتكنولوجيا الغذاء، وزارة العلوم والتكنولوجيا، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: almaarroof@yahoo.com

يعد مرض التفحم الشائع من أهم أمراض القمح في منطقة الجزيرة والمناطق الشمالية من العراق. تم اختبار كفاءة المبيد الفطري Lamardor FS (Tebuconazole) في مقاومة مرض التفحم الشائع عن طريق معاملة البذار قبل الزراعة مقارنة بالمبيد الكيماوي ديفيندين (Difenoconazole) وراكسيل (Raxil) (Tebuconazole). أعدت حبوب صنف القمح 'انتصار' و 'ربيعه' اصطناعيا بالأبواغ التيلية لفطريات التفحم مع ترك أحد المعاملات بدون عدوى لغرض المقارنة، ثم عوملت الحبوب بالمبيد Lamardor FS بخمسة تراكيز (5، 7.5، 10، 15 و 20 مل من المبيد/100 كغ حبوب) وبالتركيزين 150 و 200 غ/100 كغ حبوب لكل من مبيدي راكسيل وديفيندين، على التوالي، مع ترك مجموعة دون معاملة كشاهد. زرعت الحبوب الملونة والمعاملة بالمبيدات المستخدمة في خطوط بمواقع بيئية مختلفة. أظهرت نتائج الدراسة كفاءة عالية لجميع تراكيز المبيد في مقاومة المرض من خلال اختزال نسبة الإصابة بالمرض مقارنة بمعاملة الشاهد بمقدار 97-100% في الصنف 'ربيعه' و 98-100% في الصنف 'انتصار'. كما لم يلاحظ وجود أي تأثير سلبي للمبيد على نسب الإنبات وأطوال البادرات وحيوية النباتات الناتجة. في حين بلغ معدل نسب الإختزال الناجمة عن استخدام مبيدي راكسيل وديفيندين 97.2 و 100%، على التوالي.

P 2

مقارنة فاعلية بعض المبيدات الفطرية لمكافحة مرض التعفن الرمادي على البندورة. محمد طويل¹، وطفة الإبراهيم² وبراءة محرز². (1) كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: mtawil@scs-net.org؛ (2) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية، اللاذقية، سورية.

نفذت تجربة حقلية لمقارنة فاعلية ثلاثة مبيدات فطرية جهازية لمكافحة مرض التعفن الرمادي على البندورة المتسبب عن الفطر *Botrytis cinerea* تحت ظروف الزراعة المحمية وهي: السا (50% Carbendazim) وباومل (25% Diethofencarb) وسويتش (25% Fludioxonil + 37.5% Cyprodinil). رشت المبيدات كمعاملة علاجية بالتركيبة المنصوح بها من قبل الشركات المصنعة وهي 75، 60 و 100 غ/100 لتر ماء، على التوالي. طبقت الرشاة الأولى بعد وصول الإصابة لنسبة تزيد عن 70% وكررت المعاملة مرة ثانية بعد 10 أيام. تم تقييم فاعلية المبيد بالإعتماد على نسب الإصابة وشدها. أظهرت النتائج أن المبيد سويتش كان الأكثر فاعلية (70.0%)، في حين ظهر المبيد باومل أقل فاعلية (59.5%)، أما المبيد السا فكان غير فاعل. كما تبين أن مزج المبيدين السا وباومل زاد من فاعلية كل مبيد لوحده (67.2%).

P 3

دراسة مقارنة لكفاءة بعض المبيدات الفطرية على مرض الصدأ البني للقمح (*Puccinia recondita* f.sp. *tritici*). نورة عليوي¹، سمير مساعدي¹، جمال بوالخولة² وصليحة عطاب³. (1) قسم البيولوجيا، جامعة 8 ماي 1945، قالمة 24000، الجزائر، البريد الإلكتروني: allioui_24@yahoo.fr؛ (2) قسم البيولوجيا، المركز الجامعي العربي التبسي، تبسة 12000، الجزائر؛ (3) قسم البيولوجيا، جامعة باجي مختار، عنابة 23000، الجزائر.

يهدف مقارنة كفاءة بعض المبيدات الفطرية المتداولة في الجزائر على مرض الصدأ البني للقمح (*Puccinia recondita* f.sp. *tritici*). الذي يعد من الآفات الواسعة الانتشار والتي ينجم عنها كل عام خسائر مهمة في مردود المحصول. اعتمدت هذه الدراسة على رش ثلاثة مبيدات هي: (Cyproconazole + Propiconazole) ARTEA 330 EC والذي استعمل في مرحلتي الاضطاء والإنتياج بجرعة 0.4 لتر في الهكتار، (Propiconazole) TILT 250 EC الذي استعمل في نهاية مرحلة الصعود بجرعة 0.5 لتر في الهكتار و (Flusilazole + Carbendazime) PUNCH CS الذي استعمل في مرحلة الاضطاء بجرعة 0.9 لتر في الهكتار. تم قياس عدة معايير لاستخلاص درجة الوقاية التي يوفرها المبيد، وتم التركيز على عاملين أساسيين وهما كفاءة المبيد ضد المرض، وتأثير المعاملة في نمو ومردود المحصول. أظهرت النتائج فروقات معنوية بين مختلف المعاملات بالنسبة لمجموع المعايير المدروسة، وسجلت أحسن نتيجة عند النباتات المعاملة بالمبيد ARTEA 330 EC في طور الإنتياج.

مبيدات الآفات الكيمائية

W 40

الأثر المثبط لنبات الزعفران (*Crocus sativus* L.) في الأعشاب. محمد أشغريبور ومحمد رشيد موحاسيل، قسم المحاصيل، كلية الزراعة، جامعة فردوسي في مشهد، ص.ب. 91775-1163، مشهد، إيران، البريد الإلكتروني: m_asgharipour@yahoo.com

تتأثر طرق مكافحة الأعشاب بالجو، وهي مكلفة وبحاجة إلى عمالة كثيرة. كما تؤدي المعاملة غير الرشيدة بمبيدات الأعشاب إلى مشاكل بيئية. فاستعمال أحد البدائل للتغلب على هذه المشاكل يكمن في استراتيجية استخدام ظاهرة التثبيط ومبيدات الأعشاب الحيوية من أجل ديمومة الزراعة. يعرف نبات الزعفران باحتوائه على مواد ذائبة في الماء، لها أثر مثبط لنمو نباتات أخرى. أظهرت نتائج التجارب المخبرية في أطباق بتري على بذور مشربة بالماء أن المستخلص المائي لأوراق وكورمات الزعفران قد خفض إنبات البذور ونمو الأعشاب التالية: الرمرام (*Chenopodium spp.*)، عنب الذيب (*Solanum nigrum*)، وحشيشة جونسون (*Sorghum halepense*). وكان هناك ارتباط قوي بين تركيز المستخلص ودرجة التأثير. وكان طول الجذير الصفة الأكثر حساسية للمستخلص، بينما كانت نسبة الإنبات الأقل حساسية. تميز أثر المستخلص في صفة الإنبات بأن له تأثيرين مختلفين: تأخير الإنبات أو منعه، اعتماداً على التركيز المستخدم. إذ أدى التركيز العالي إلى منع الإنبات والتركيز المنخفض إلى تأخير الإنبات. كان أثر مستخلص الأوراق أقوى من مستخلص الكورمات في منع ظهور البادرات ونموها. تقترح نتائج هذه التجربة بأن مستخلص الزعفران يمكن أن يكون مفيداً كمبيد أعشاب وأنه يحتوي على مواد حيوية يمكن تطويرها كمبيدات للآفات، إلا أن هذه الظاهرة بحاجة إلى مزيد من البحث.

W 41

الأثر المثبط للنعناع البري (*Mentha longifolia*) على إنبات ونمو عدد من المحاصيل الزراعية. علا استانبولي، غسان ابراهيم وأنور المعمار، قسم وقاية النبات، كلية الزراعة، جامعة دمشق، دمشق، سورية.

تعد المنافسة الخفيفة إحدى الطرائق الحديثة الواعدة في مجال مكافحة المتكاملة للأعشاب الضارة، ولا يمكن إغفال دور هذه الظاهرة الإيجابي أو السلبي على النباتات الأخرى. لم يكن هناك أي تأثير لمستخلصات النعناع البري في إنبات بذور القمح، بينما كان التأثير سلبياً وبصورة معنوية في إنبات بذور الشعير والشوفان البري، فلم تتجاوز نسبة إنبات الشعير المعامل 40% مقارنة مع الشاهد 96% و 25% بالنسبة للشوفان البري المعامل مقارنة مع الشاهد (50%). كذلك أعاق إضافة المستخلصات نمو السويقة والجذير للشعير والشوفان البري وبصورة معنوية دون وجود أي تأثير معنوي في نمو بادرات القمح. دلت هذه الدراسة على مدى حساسية الشعير والشوفان البري لمستخلصات النعناع البري وعدم تأثر نباتات القمح في تجارب عامي 2005 و 2006، الأمر الذي أشار إلى وجود بعض المركبات الكيميائية في النعناع البري تؤثر في نمو الشعير والشوفان البري وربما تفتح باباً جديداً أمام إمكانية استغلال هذه الظاهرة لمكافحة الشعير البري في حقول القمح.

W 42

التأثير التثبيطي لمستخلص الترب الملوثة ببقايا زهرة/عباد الشمس ضمن مراحل نمو مختلفة في نمو القمح وزهرة الشمس. وسن صالح حسين وصلاح محمد سعيد الطائي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: Dr_Salahaltai@yahoo.com

أجريت تجارب في البيت الزجاجي لبيان التأثيرات التثبيطية لزهرة/عباد الشمس (صنف محلي وسوري) وفي أربع مراحل نمو (البادرات، الاستطالة، الأزهار والنضج) وعند ثلاثة تراكيز (0.5، 1.5، 2.5%) في إنبات ونمو صنفين من القمح وزهرة الشمس. أظهرت النتائج حصول تباين في التأثيرات التثبيطية للترب الحاوية على مخلفات زهرة الشمس بالنسب المختلفة، وكانت مرحلة النضج أعلى نسبة تثبيط في معظم المعاملات، وسبب التركيز 0.5% حدوث أكثر تثبيط في معظم الصفات المدروسة. أكدت نتائج التحليل الإحصائي وجود فروقات معنوية بين أصناف القمح وزهرة الشمس من ناحية حساسيتها لتأثيرات مخلفات زهرة الشمس موضحة تفوق القمح صنف أم ربيع وزهرة الشمس صنف محلي على بقية الأصناف في اعطائه أفضل إنبات ونمو.

W 37

مشاكل وفرص ظاهرة التثبيط - مراجعة. محمد عزم خان و خان باحادار ماروات، قسم علوم الأعشاب، جامعة بيشاور، باكستان، البريد الإلكتروني: ahmadzaipk@yahoo.com

يقصد بالمصطلح Allelopathy في أغلب الأحيان بظاهرة الأثر الضار من نبات على آخر من خلال الإفرازات الكيميائية السامة. ويتوقع في المستقبل القريب استغلال هذه الظاهرة في إدارة مكافحة الأعشاب، وذلك من خلال التقانات الحيوية، أو باستخدام المستخلصات النباتية. وتعتبر هذه الظاهرة حقلاً رائعاً للدراسة وهو بحاجة إلى استكشاف موسع. يدعي كثير من الباحثين بأن هذه الظاهرة تؤدي إلى نظام زراعة المحصول الواحد، وتضر بالتنوع الحيوي، كما تؤدي حبوب اللقاح في بعض الأنواع المثبطة لإيقاف تكون الثمار في كثير من المحاصيل الخضرية وأشجار الفاكهة. وأن الإفرازات المثبطة تلوث التربة، وتمنع تكون العقد البكتيرية على جذور البقوليات وسامة للسماك والحيوانات البحرية، كما أنها تؤثر سلباً على الوظائف الفسيولوجية في النبات. أن المعرفة التفصيلية عن أي نوع نباتي مثبط يمكن أن يؤدي إلى استغلال عشبة ما لمكافحة عشبة أخرى أو استغلال المحاصيل لمكافحة الأعشاب. ولتحقيق هذا الهدف فإننا بحاجة إلى مجهود العلماء المتضاهرين في مجالات الأعشاب والكيمياء والبيئة ومصنفي النبات من أجل المزيد من الاكتشافات والمزيد من الفهم لهذه الظاهرة والتي ستؤدي إلى إيجاد حلول للعديد من المشاكل البيئية في وقتنا الحاضر. وهكذا، فإن اكتشاف ظاهرة Allelopathy تقدم فرصاً غير محدودة وتساهم في حل الكثير من المشاكل الزراعية.

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التأثيرات المثبطة للخيار (*Cucumis sativus* L. cv. Iba) في عدد من الأنواع العشبية الشائعة في الأردن. جمال راغب قاسم ونبيل نوح عيسى، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، ص.ب. 13282، الرمز البريدي 11942، عمان، الأردن، البريد الإلكتروني: jrqaem@ju.edu.jo

تم إجراء عدد من التجارب لدراسة إمكانية حدوث تأثيرات مثبطة للخيار صنف ابا (*Cucumis sativus* L. cv. Iba) في عدد من الأنواع العشبية الشائعة وذلك تحت ظروف المختبر والبيوت الزجاجية. أظهرت النتائج أن المستخلصات المائية للأفرع الخضرية للخيار قد خفضت نسبة الإنبات والنمو لأعشاب عرف الديك القانم (*Amaranthus retroflexus* L.) والرمرام (*Chenopodium murale* L.) والجرجير (*Eruca sativa* Mill.) والخبيزة (*Malva sylvestris* L.) والبقلة (*Portulaca oleracea* L.) وعنب الديب (*Solanum nigrum* L.) المزروعة في أطباق زجاجية. أظهرت الأعشاب اختلافات واضحة في درجة حساسيتها للمستخلص المائي لنباتات الخيار وكان عشبي الرمام والبقلة هما الأقل تأثراً. إن إضافة 1 مل من المستخلص إلى الأطباق الزجاجية كان كافياً لخفض إنبات ونمو جميع الأنواع العشبية التي تمت دراستها وازداد التأثير الضار بزيادة تركيز المستخلص. أظهر الماء الراشح من المجموع الخضري للخيار سمية لكافة الأنواع وخفض بصورة إحصائية إنبات (ما عدى الرمام والبقلة) ونمو الأعشاب التي تمت دراستها، وكان التأثير أكثر ضرراً للمجموع الجذري مقارنة بالمجموع الخضري. لقد كان تأثير الأبخرة المتطايرة من مستخلص الأفرع الخضرية للخيار واضحاً على كافة الأنواع العشبية المدروسة حيث أدت إلى قصر في نمو الأفرع والجذور. وبالمقابل أدى خلط مخلفات الأفرع الجافة للخيار في التربة إلى تشجيع نمو المجموع الخضري للأعشاب ولكن نمو جذور الرمام والجرجير والخبيزة فقط قد تأثر مما يدل على أن المواد المثبطة الكيميائية هي أبخرة متطايرة في طبيعتها. من ناحية أخرى عملت المخلفات المتحللة لأفرع نباتات الخيار على تثبيط نمو المجموع الخضري لعشبي عرف الديك القانم وعنب الديب وكذلك نمو جذور كافة الأنواع العشبية باستثناء عشب الجرجير. وأظهرت النتائج أنه في حين أن رش المستخلص المائي لنباتات الخيار على المجموع الخضري للأعشاب لم يعط أية نتيجة ذات دلالة إحصائية فإن المستخلص المضاف للتربة كان ساماً وخفض إنبات ونمو كافة الأنواع العشبية، إلا أن نباتات البقلة كانت هي الأقل تأثراً بهذه المعاملة.

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تأثير مخلفات محصول البطاطا/البطاطس على نمو بادرات بعض المحاصيل والأعشاب. سمير طباش، قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: tabbache@scs-net.org

تم دراسة تأثير استخدام المستخلص المائي للمجموع الخضري المجفف لنبات البطاطا بتركيز 2% و4% على نمو بادرات القمح والجلبان والفجل والرشاد والهندباء في أطباق بتري. أدت المعاملة بالمستخلص إلى زيادة طول سويقات القمح والجلبان والفجل. كان تأثير التركيز 4% مثبطاً لطول سويقات الرشاد والهندباء. أما التأثير في جذور النباتات المدروسة فكان مثبطاً خاصة لنباتات الفجل والرشاد والهندباء بنسبة وصلت إلى 73% من طول جذور الرشاد مقارنة مع للشاهد. أدى إضافة 5% و10% من مخلفات المجموع الخضري المجفف إلى تربة اصص الزراعة إلى نقص في طول النباتات ووزنها الرطب بنسبة تتراوح بين 25-75% بالنسبة للشاهد. يمكن إجراء تجارب إضافية على نباتات وأعشاب أخرى لمعرفة التأثير الحيوي لهذه البقايا على نمو المحاصيل والأعشاب في الأنظمة الزراعية.

طرائق مكافحة الأعشاب الضارة في حقول الذرة البيضاء في معظم مناطق زراعتها في الولايات المتحدة الأمريكية، وترش مبيدات الأعشاب قبل الزراعة على سبيل المثال بمبيد الاترازين أو ميتولاكلور، ثم ترش المبيدات أيضاً بعد ظهور بادرات الذرة البيضاء فوق سطح التربة بمبيدات مثل الاترازين أو 2،4-د أو داي كامبا. إن نجاح استعمال مبيدات الأعشاب الضارة لها محدداتها، فقد أدت قلة رطوبة التربة إلى خفض فاعلية المبيدات التي تضاف عند الزراعة، بينما تؤدي المبيدات المضافة بعد ظهور النباتات إلى أضرار على نباتات الذرة البيضاء. بالإضافة إلى ذلك طورت العديد من الأعشاب الضارة مناعة ذاتية ضد المبيدات وخاصة عشبة *Amaranthus spp.* التي طورت مناعة لمبيد اترازين، كما أن لمبيدات بعد البروغ فاعلية ضعيفة في مكافحة الأعشاب النجيلية مثل *Digitaria spp.*، *Echinochloa crusgalli* و *Setaria spp.* لا توجد مبيدات فعالة لمكافحة الحشائش الضارة في محصول الذرة البيضاء في مناطق متعددة من العالم. لقد تم التعرف على سلالات ذرة بيضاء تتحمل المبيدات المثبطة لعمل الأنزيم Acetolactate synthase (ALS) في جامعة ولاية كنساس. تم العثور على جينات يمكن إدخالها إلى نبات الذرة البيضاء التي تجعل منها نباتات مقاومة إلى مبيدات الأعشاب الضارة التي تستطيع تثبيط عمل الأنزيم ALS. لقد تم الحصول على هذه الجينات من نبات قريب جداً إلى نبات الذرة البيضاء هو Shatter cane. تعود السيطرة التي تتحكم بالمقاومة إلى مبيدات التي تثبط عمل أنزيم ALS إلى جين واحد منتخب. يعطي هذا الجين المناعة لمبيدات تعود إلى مجموعات كيميائية مختلفة ولكنها جميعاً تثبط فاعلية الأنزيم ALS. تستطيع هذه المبيدات مكافحة الأعشاب الرفيعة والعريضة الأوراق التي تنمو في محصول الذرة البيضاء. وبالإضافة إلى ذلك تستخدم الآن هذه المبيدات لمكافحة النبات المتطفل *Striga* في غرب القارة الأفريقية، وثبت أن 0.0125 مغ من مبيد مسلفرون/بذرة لمعاملة بذور الذرة البيضاء يؤدي إلى مكافحة 90% من نباتات الـ *Striga* لفترة 60 يوماً بعد الزراعة. ويتوقع أن نباتات الذرة البيضاء التي لديها مناعة وتثبط عمل أنزيم ALS سوف تسمح باستعمال مبيدات فعالة جداً على الأعشاب رفيعة وعريضة الأوراق. تستعمل هذه المبيدات عادة بجرعات صغيرة جداً، وتملك مواصفات ممتازة من حيث قلة تسربها إلى المياه وقلة تأثيراتها الضارة في البيئة. وبالرغم من ذلك فقد أثرت تساؤلات عديدة حول إنتاج واستخدام هذا النوع من البذور بصورة تجارية وتطور مناعة في الأعشاب ضد المبيدات المذكورة، وظهور أنواع أعشاب أخرى، وانتقال الجينات المنيعة إلى النباتات البرية من أقارب الذرة البيضاء بما فيها عشبة القصبية *Sorghum halepense*.

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برمجة المكافحة الكيميائية للباذنجان البري *Solanum elaeagnifolium Cav.* بالاعتماد على دراسة حركة الكربوهيدرات اللايبوية في النبات. ماجد خناس، الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية بحلب، الميدان، ص.ب. 4195، حلب، سورية، البريد الإلكتروني: hayat73@scs-net.org

يعدّ الباذنجان البري أحد أهم أنواع الأعشاب الضارة في كثير من الدول. ونظراً لتسجيل انتشاره في المحافظات الشرقية من سورية في السنوات العشر الأخيرة وبهدف مكافحة هذا النبات وتحديد الفترة المثلى للتدخل كيميائياً أو ميكانيكياً فقد درست الدورة السنوية للمخزون السكري (الكربوهيدرات)، حيث جمعت نباتات الباذنجان البري من ثلاثة مواقع ببنية مختلفة في مناطق الانتشار وهي أطراف الطرقات والأراضي الزراعية (ضمن محصول القطن) والأراضي البور، وتم تتبع حركة السكريات في أجزاء النبات المختلفة شهرياً بعد استخلاص المادة الجافة بالحلمأة الحامضية واستخدام إختبار الأنثرون وذلك بقياس شدة اللون الناتج وقراءة الطيف الضوئي على طول موجة 612 نانومتر. بينت النتائج أن جذر الباذنجان البري هو العضو التخزيني الرئيس للكربوهيدرات اللايبوية (السكريات)، في حين كان التاج والساق من الأعضاء التخزينية الثانوية والتي تتراكم فيها الكربوهيدرات بكميات أقل، ولذلك تم تتبع تركيز السكريات في الجذر حيث سجلت التراكيز المرتفعة في طور السكون وفي نهاية أطوار نمو النبات، ثم بدأ هذا التركيز بالانخفاض مع دخول النبات طور التجديد ليستمر حتى نهاية تشكل البراعم الزهرية حيث سجل في هذا الطور الفينولوجي أخفض نسبة لتركيز السكريات في الجذر ولمختلف المواقع البيئية، تبع هذا الانخفاض ارتفاع استمر حتى النضج الكامل. وجد أن التدخل بمبيد جهازي لمكافحة نبات الباذنجان البري يكون فعالاً إذا ما تم الرش بنهاية طور الأزهار حيث يكون النبات في وضع بدء إنتقال السكريات نحو الجذور، وأن أخفض مستوى للمخزون السكري للتدخل الميكانيكي، أو التدخل بمبيدات تلامسية يتوافق مع مرحلة بدء الأزهار. واعتماداً على هذه النتائج فقد أظهرت معظم المبيدات التي تمت تجربتها كفاءة في مكافحة الباذنجان البري خارج الأراضي الزراعية عندما طبقت بفترة نهاية الأزهار و بدء العقد. وقد تفوق المبيدان Imazapyr بمعدل 4 ليتر مستحضر تجاري/هكتار و Picloram بمعدل 1 ليتر مستحضر تجاري/هكتار في مكافحة نباتات الباذنجان البري على أساس عدد النباتات في المساحة والوزن الجاف وعدد الثمار وكفاءة تراوحت بين 84.30 و 100%.

W 33

أثر مبيدات الأعشاب المختلفة على نمو نباتي البيتونيا والماري جولد وعلى مكافحة الأعشاب. ج. سعدي، م. كيشفازي، ك. رازمجو وم.ر. خاجهابور، قسم المحاصيل، جامعة أصفهان للتكنولوجيا، أصفهان 8415683111، إيران، البريد الإلكتروني: gsaeidi@cc.iut.ac.ir

تزرع نباتات البيتونيا (*Petunia hybrida*) والماري جولد (*Tegets erecta*) على نطاق واسع من أجل تجميل المناظر الطبيعية في مقاطعة أصفهان التي تقع في وسط إيران. تعتبر مكافحة الأعشاب عملية مهمة لنجاح زراعة هذه النباتات، إلا أن التعشيب اليدوي عملية بطيئة ومكلفة. هدفت هذه التجربة دراسة تأثير ثلاث مبيدات أعشاب (تريفلان، دكنال، وجالانت) إضافة إلى شاهد خال من الأعشاب وشاهد آخر معشوب في تجربة بتصميم القطاعات العشوائية الكاملة في أربع مكررات على مكافحة الأعشاب وعلى نمو البيتونيا والماري جولد. تم إجراء التجربة في محطة الأبحاث التابعة إلى جامعة أصفهان للتكنولوجيا. أدت معاملة مبيدات الأعشاب: تريفلان، دكنال، وجالانت إلى تخفيض وزن المجموع الخضري الجاف للأعشاب في المتر المربع بنسبة 61، 46 و 24%، على التوالي مقارنة بالشاهد المعشوب. ولم تكن نتيجة مبيد جالانت ذات تأثير معنوي. وبالمقارنة مع الشاهد الخالي من الأعشاب، لم تؤثر المعاملة بمبيدات الأعشاب على طول النبات إلا أنها أثرت على طول فترة بقائه بدرجة معنوية. لقد خفض المبيد جالانت وتريفلان نمو البيتونيا تخفيضاً معنوياً. وأدت المعاملة بتريفلان، دكنال وجالانت إلى تخفيض وزن المجموع الخضري لنبات الماري جولد بنسب 35%، 26% و 12%، على التوالي. وأدت المعاملة بالتريفلان ودكنال إلى تخفيض معنوي في طول نبات الماري جولد و نموه. كما أدت المعاملة بالمبيدات إلى تخفيض مدة بقاء هذه النباتات.

W 34

تطوير نباتات عدس محورة وراثياً مقاومة لمبيد الأعشاب (*glufosinate ammonium (phosphinothricin)*). فاتح خطيب¹، سمير قدسية¹ ومايكل باوم². (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، سورية، البريد الإلكتروني: f.khatib@cgiar.org؛ (2) ايكاردا، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: m.baum@cgiar.org

يزرع العدس *Lens culinaris Medik.* كمحصول شتوي في كل من أمريكا الشمالية وغرب آسيا والشرق الأوسط وفي شبه القارة الهندية، كما أنه يعتبر واحداً من أهم المحاصيل البقولية الغذائية في القطر العربي السوري. ويأتي هذا المحصول في المرتبة السابعة من حيث الأهمية بين المحاصيل البقولية الحبية حيث يزرع في حوالي 48 بلداً حول العالم وبمساحة كلية مقدارها 3.5 مليون هكتار تنتج ما يزيد على 3 ملايين طن. تؤثر الأعشاب الضارة بشكل كبير في إنتاجه وذلك لانخفاض قدرته على منافستها. نظراً لندرة مبيدات الأعشاب الاختيارية المتخصصة في حقول العدس فقد هدف هذا البحث إلى إدخال صفة المقاومة لأحد مبيدات الأعشاب غير الاختيارية إلى هذا النبات من خلال عملية التحوير الوراثي. استخدمت في هذه الدراسة المورثتان *bar* التي تمنح صفة المقاومة لمبيد الأعشاب (*glufosinate ammonium (phosphinothricin or PPT)*) من خلال تركيبها للأنزيم *phosphinothricine acetyl transferase (PAT)* الذي يعمل على تعطيل عمل هذا المبيد والمورثة *gus* التي تستخدم كمؤشر للتأكد من حدوث عملية انتقال المورثات. أدخلت هاتين المورثتين إلى البلازميد *pCGP1258* ومن ثم استخدم البلازميد المؤشب *recombinant DNA* في تحوير السلالة *Ag10* للبكتريا *Agrobacterium tumefaciens* التي استخدمت لاحقاً في تحوير نباتات العدس. تم استخدام ثلاثة أصناف من العدس (ILL5582، ILL5883 و ILL5588)، وتم الحصول على النباتات المحورة وراثياً بعد 6-9 مراحل من الانتخاب ومن ثم أجري تطعيمها على أصول بذرية غير محورة. تم التحقق من نجاح عملية انتقال المورثات الجديدة إلى نباتات العدس بواسطة التفاعل التسلسلي البوليميرازي PCR، حيث استخدمت بادئات متخصصة (*primers*) لمكثرة قطعة من المورثة *bar* طولها 250 زوج من القواعد. تم تقييم عمل المورثة *bar* في نباتات الجيل T_0 تحت ظروف متحكم بها، وذلك بدهن أوراق النباتات المحورة بمبيد الأعشاب PPT بتركيز 600 مغ/ليتر وتبين بأن جميع النباتات كانت مقاومة. كما تم التأكد من تعبير (expression) المورثة *gus* من خلال إجراء اختبار كيميائي لأنسجة الوريقات والأزهار الذي كان موافقاً ومؤكداً لإختبار دهن الأوراق. أكدت النتائج أنه قد تم بنجاح توريث صفة المقاومة لمبيد الأعشاب *glufosinate ammonium* إلى نباتات الجيل T_1 ، ونكون بذلك قد حصلنا على نباتات العدس المقاومة للمبيد من خلال عملية التحوير الوراثي.

W 35

الفوائد والتحديات التي تواجه تطوير نباتات الذرة البيضاء المقاومة لمبيدات الحشائش الضارة. قاسم الخطيب ومتمش تونسترا، جامعة ولاية كنساس، منهاتن، كنساس، الولايات المتحدة الأمريكية، البريد الإلكتروني: Khatib@ksv.edu

قد تؤدي الأعشاب الضارة في حقول الذرة البيضاء إلى انخفاض حاصل الحبوب بنسبة تصل إلى 55%، بالإضافة إلى انخفاض نوعية الحبوب وزيادة الأمراض والحشرات ومشاكل في عملية الحصاد الميكانيكية. تعد مبيدات الأعشاب من أهم

التي نضجت في أعلى نورة النبات الأم. إنخفض الوزن الجاف للبادرة بنسبة 35.7% للبذور التي نضجت في شهر أيلول/سبتمبر مقارنة بنضجها في شهر آب/أغسطس. كما انخفض أيضا الوزن الجاف للبادرة بنسبة 18.6% التي جمعت من أسفل النورة مقارنة بوزن البادرات التي نمت من البذور التي جمعت من أعلى نفس النورة.

W 31

تأثير بعض المبيدات في مكافحة الأعشاب وإنتاج البطاطا/البطاطس. مزاحم الداحول¹، بهاء الرهبان² وسمير طباش³.
(1) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث حماة، حماة، سورية، البريد الإلكتروني: m.dahool@gawab.com؛
(2) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية. دوما، ص. ب. 113، دمشق، سورية؛ (3) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية.

أجريت التجربة خلال الموسمين 2004 و 2005 على محصول البطاطا/البطاطس - العروة الربيعية في مركز البحوث العلمية الزراعية بحماة واستخدم فيها عدد من مبيدات أعشاب بعد الزراعة وقبل البزوغ، وهي: Prometryne (750 غ مادة فعالة/هكتار)، Linuron (1250 غ مادة فعالة/هكتار)، Isoxaflutol (منفردا بمعدل 76.5 و 90 غ مادة فعالة/هكتار) ومخلوطا مع المبيد Linuron (750 + 37.5 غ مادة فعالة/هكتار)، Cyanazine (منفردا بمعدل 800 غ مادة فعالة/هكتار) ومخلوطا مع المبيد Linuron بمعدل (800+1200 غ مادة فعالة/هكتار)، Oxadiazon (1250 غ مادة فعالة/هكتار)، ومبيد واحد بعد الزراعة وبعد الإنبات هو Ammonium Glyphosinate (400 غ مادة فعالة/هكتار)، بالإضافة إلى معاملة التعشيب اليدوي التي نفذت ثلاث مرات خلال الموسم والشاهد غير المعشوب. كانت الأعشاب عريضة الأوراق هي السائدة، بينما كانت الأعشاب رفيعة الأوراق قليلة جدا. بينت النتائج وجود سمية طفيفة للمبيدات المختبرة على نباتات البطاطا/البطاطس ولكنها زالت لاحقا، ما عدا المبيدين Cyanazine و Oxadiazon الذين لم يسجلا أية أعراض سمية على البطاطا/البطاطس المزروعة. تفوقت كافة المعاملات معنويا وبفاعلية ممتازة في مكافحة الأعشاب عريضة الأوراق على معاملة الشاهد غير المعشوب، واستمر هذا التفوق حتى بعد 72 يوما من الزراعة. خفض المبيد Oxadiazon الوزن الجاف للأعشاب بنسبة 98.63، 98.91% في الموسمين 2004 و 2005، على التوالي. كذلك خفض المبيد Isoxaflutol منفردا بالمعدل المذكورين أو مخلوطا مع Linuron وزن الأعشاب الجاف بنسبة 92.41، 88.94 و 74.67% في موسم 2004، وبنسبة 87.12، 94.37 و 83.53% في موسم 2005، على التوالي. وكان المبيد Cyanazine أقلها كفاءة، حيث خفض وزن الأعشاب بنسبة 53.04 و 43.65% في الموسمين 2004 و 2005. تفوقت جميع المعاملات على الشاهد غير المعشوب، بينما تقاربت إنتاجية كافة المعاملات من إنتاجية التعشيب اليدوي في الموسم الثاني ما عدا المبيدين Prometryne، Cyanazine.

W 32

المكافحة الكيميائية للأعشاب الضارة في حقول القطن. بهاء الرهبان¹، علي شاكرا¹، محمد أكرم بقله¹، خليل الحسين²، عبدا لله الملا² وسعيد السعدون². (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية. دوما، ص. ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarpartect@mail.sy؛ (2) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث دير الزور، دير الزور، سورية.

نفذت التجارب في مركز البحوث العلمية الزراعية بدير الزور خلال الموسمين 2003 و 2004 باستخدام عدد من المبيدات العشبية بعد الزراعة وقبل البزوغ (ترايفلورالين، برومترين وسيانازين) ومبيد واحد بعد الزراعة وبعد البزوغ وهو بيريثيوباك الصوديوم وبعده تراكيز في حقول القطن. بينت النتائج خلال الموسمين أن جميع المعاملات تفوقت على معاملة الشاهد غير المعشوب، ولم تظهر فروقات معنوية بين المبيدات. واختلفت هذه المبيدات فيما بينها في مكافحة أنواع الأعشاب العريضة التي رافقت محصول القطن حيث تفوق المبيد بيريثيوباك الصوديوم مع مادة لاصقة ودونها وبالتركيزين المختبرين على بقية المبيدات في مكافحة عشبة عرف الديك (*Amaranthus* sp.). بينما تفوق المبيدان برومترين وسيانازين على بقية المعاملات، وبلغت فاعليتها 100% على عشبة رجل الوزه (*Chenopodium album*) و 91.9-100% على عشبة البقلة (*Portulaca oleracea*). وتفوقت المبيدات المستخدمة قبل البزوغ (ترايفلورالين، برومترين، وسيانازين) على مبيد بيريثيوباك الصوديوم المستخدم بعد البزوغ في مكافحة عشبة الدهنان (*Echinochloa crus-galli*)، وقد بلغت كفاءتها 87.8-96.4%. حققت جميع المعاملات زيادة واضحة في الإنتاجية بالمقارنة مع الشاهد غير المعشوب، ولم تكن الفروقات معنوية بين المعاملات. بينما تفوق المبيد ترايفلورالين على مبيد بيريثيوباك الصوديوم

الجاف للأفرع الخضرية أو في إنتاج الرؤوس الزهرية لنباتات القرنبيط. وأدت المعاملة بمبيد اللينورون (1.7 كغ/هكتار) الى سمية لنباتات القرنبيط فقط حيث انخفض نمو المجموع الخضري ومحصول الرؤوس الزهرية بالرغم من أن المعاملة بهذا المبيد قد خفضت إنتاج الأعشاب بمعدل النصف مقارنة بالشاهد المعشب.

W 28

تأثير مكافحة الأعشاب الضارة في تراكم المادة الجافة وامتصاص العناصر الغذائية في نباتات البندورة/الطماطم والأعشاب الضارة النامية معها. عباس أحمد باوزير وعلي مشهور الجنيدي، كلية ناصر للعلوم الزراعية، جامعة عدن، اليمن، البريد الإلكتروني: abbawazir@hotmail.com

نفذت تجربتان حقليتان خلال موسمي 99/98 و 2000/99 بمزرعة كلية ناصر للعلوم الزراعية-لحج/اليمن، بهدف تقويم فاعلية مكافحة الأعشاب الضارة على تراكم المادة الجافة والعناصر الغذائية (النيتروجين، الفوسفور، البوتاسيوم، الكالسيوم والمغنيزيوم) في نباتات الطماطم وكذا الأعشاب الضارة النامية معها بعد 60 يوماً من الشتل. درست خمس معاملات للمكافحة تضمنت معاملة التعزيق، وأربع معاملات هي عبارة عن إضافات مختلفة من مبيدي متركبات وبنديميثالين بمعدل 500 جرام مادة فاعلة للهكتار لكل منهما عند كل إضافة. هذا بالإضافة إلى معاملة الشاهد (دون مكافحة). أظهرت النتائج تفوق جميع معاملات المكافحة المدروسة في تخفيضها معنوياً لكمية المادة الجافة المتراكمة والعناصر الغذائية الممتصة (النيتروجين، الفوسفور، البوتاسيوم، الكالسيوم والمغنيزيوم) المتراكمة في الأعشاب الضارة النامية مع نباتات الطماطم/البندورة مقارنة بالشاهد، وكان أفضلها على الإطلاق تلك المعاملة التي تم فيها إضافة المبيدين متركبات وبنديميثالين قبل الشتل ثم المتركبات بعد الشتل بثلاثين يوماً، إذ أدت إلى انخفاض الكمية المتراكمة من المادة الجافة بالأعشاب الضارة بمعدل 99.4 و 96.9% وكذا العناصر بمعدلات: النيتروجين 98.6 و 95.5%، الفوسفور 98.0 و 93.2%، البوتاسيوم 99.1 و 96.6%، الكالسيوم 99.3 و 96.4% والمغنيزيوم 98.6 و 95.8% للموسمين، على التوالي مقارنة بالشاهد. وارتفعت الكمية المتراكمة من المادة الجافة في نباتات الطماطم النامية بهذه المعاملة بمعدل 138 و 93.8%، وكذا العناصر المدروسة بمعدلات 217.9 و 159%؛ 173 و 122.2%؛ 173.3 و 122.4%؛ 139.4 و 95.1%؛ 165.5 و 116.4% للموسمين، على التوالي مقارنة بالشاهد.

W 29

تأثير التداخل بين بعض مبيدات الأعشاب ومعدلات ومواعيد اضافتها في حاصل القطن والأعشاب المرافقة له. داليا سليم الكبي¹ و شاكر مهدي صالح² و رمضان أحمد الطيف². (1) قسم علوم المحاصيل الحقلية، كلية الزراعة، جامعة بغداد، أبو غريب، العراق؛ (2) قسم المحاصيل، كلية الزراعة، جامعة تكريت، العراق، البريد الإلكتروني: wisam_ali2004@yahoo.com

طبقت هذه التجربة في حقل يقع شمال تكريت لدراسة تأثير مبيدات الأعشاب (Focus ultra cycloxydim) بمعدل 2.00-3.00 ل/هـ و Fusilade super (fluazifop-p-butyl) بمعدل 0.75 و 1.50 ل/هـ و Gallant super (haloxyfop-r methyl ester) بمعدل 0.75 و 1.50 ل/هـ وبمواعدي إضافة، بعد 7 و 10 أسبوع من الزراعة والتداخل بين المبيدات والمعدلات والمواعيد المستخدمة في حاصل القطن *Gossypium hirsutum* والأعشاب المرافقة. بينت النتائج وجود تأثيرات معنوية للمبيدات والمعدلات وللمواعيد وللتداخل بين المبيدات × المعدلات والمبيدات × المواعيد وللمعدلات × المواعيد وللتداخل الثلاثي، في حاصل القطن وفي العدد والوزن الجاف للأعشاب.

W 30

إختلاف إنبات بذور وظهور البادرات لعشب/لدغل الحليان *Sorghum halepense* L. حسب موقع البذرة في النورة ووقت نضجها. أحمد محمد سلطان و سالم حمادي عنتر، قسم المحاصيل الحقلية، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: ahsultan@yahoo.com

نفذت تجربة أصص في كلية الزراعة والغابات / جامعة الموصل خلال الموسم الصيفي 2003 لدراسة نسبة الإنبات ونمو البادرات لبذور دغل الحليان التي جمعت أصلاً من الموسم الصيفي بعد أن قسمت النورة الى ثلاثة مناطق عند نضج البذور. إشتملت التجربة على عاملين، الأول موعد نضج البذور على نبات الأم في شهر تموز/يوليو وأب/أغسطس وأيلول/سبتمبر وتشرين الأول/أكتوبر بينما كان العامل الثاني موقع البذرة على النورة من نبات الأم (أعلى، وسط، أسفل النورة). صممت التجربة بتصميم العشوائي الكامل (CRD) وبنظام التجارب العاملية، وبأربع مكررات. أشارت النتائج الى انخفاض نسبة الإنبات الى 63.1% وبشكل معنوي عندما نضجت البذور في شهر تشرين الأول/أكتوبر مقارنة بنضجها في شهر تموز/يوليو. كذلك لوحظ بأن البذور الناضجة في أسفل النورة ذات حيوية محدودة ونسبة إنبات بذورها أقل من البذور

الأعشاب/الحشائش (كقطع منشقة) على المعاملات التالية: أوكسي فلوروفين (جول 1.87 ليتر/هـ)، بنديميثالين (ستومب 4.25 ليتر/هـ)، أوكساديارجيل (توبستار 0.75 كغ/هـ)، أوكسي ديازون (رونستار 5.0 ليتر/هـ)، العزيق مرتين بالإضافة لمعاملة المقارنة (بدون ازالة الأعشاب/الحشائش). كما تم إجراء الشتل في موعدين 5 و 20 كانون الثاني/يناير (المعاملة الرئيسية). وقد أوضحت النتائج أن معاملة الجول في 5 كانون الثاني/يناير تسببت في زيادة تقدر بحوالي 51% لمحتوى البصل أكثر من معاملة المقارنة. أما بالنسبة لمحتوى الأبيصال من عناصر النيتروجين، الفوسفور والبوتاسيوم فإن معاملة الجول أدت إلى زيادة محتوى الأبيصال من النيتروجين والبوتاسيوم بنسبة 16.3 و 57.7%، على التوالي بعد 90 يوماً من الشتل. كما أدى إضافة التوبستار في 5 كانون الثاني/يناير إلى زيادة محتوى الأبيصال لكل من النسبة المئوية للمادة الجافة والفوسفور. لكن التوبستار في 20 كانون الثاني/يناير زاد معنوياً على كل من المواد الصلبة الكلية، السكريات الذائبة الكلية والكاربوهيدرات الكلية. بينما سبب إضافة الأستومب في 20 كانون الثاني/يناير إلى الحصول على أعلى زيادة من البروتين الحقيقي.

W 26

تأثير الأعشاب الغازية في التنوع الحيوي في الباكستان وإدارة مكافحتها. خان باحادار ماروات وسايم هاشم، قسم وقاية النبات، جامعة بيشاور، باكستان، البريد الإلكتروني: kbmarwat@yahoo.com
يتوفر في الباكستان تنوع حيوي غني إذ أنها تتميز بمدى واسع من المناخات، وتقع على خطوط عرض مختلفة ويتراوح ارتفاعها عن سطح البحر ما بين 100 م في المناطق الجنوبية، بينما تصل ارتفاعات المناطق الشمالية إلى خطوط الثلج. إلا أن التنوع الحيوي يجابه ضغوطاً قوية من مصادر متعددة مثل: مناطق توطين الأفغان المهاجرين والمصحوبين بحيوانات الرعي، والمصائب الطبيعية كالزلازل والجفاف إضافة إلى القصف المستمر خلال الحرب على أفغانستان. أدت جميع هذه الضغوط إلى تغيرات على المستوى الدقيق وخاصة في المناطق الشمالية الغربية. كما أدى الإستخدام غير الرشيد لمبيدات الأعشاب إلى تطور طرز بيئية جديدة. أدت هذه الظروف مجتمعة إلى الغزو بالأعشاب نتيجة التغير الذي حصل في التنوع الحيوي المحلي. ومن بين تلك الأعشاب الغازية نذكر: *Ipomoea eriocarpa*, *Xanthium strumarium*, *Amaranthus Imperata cylindrica*, *Tagetes minuta*, *Trianthema portulacastrum*, *Alternanthera pungens*, *Pistia*, *Prosopis juliflora*, *Ailanthus altissima*, *Broussontia papyrifera*, *Robinia pseudoacacia*, *hybridus*, *Emex* و *Galium aparine*, *Cannabis sativa*, *Parthenium hysterophorus*, *Phragmites australis*, *stratiotes*, *spinosus*. وادخلت أربع من النباتات كأشجار غابوية (مثل *Robinia pseudo-acacia*, *Broussontia papyrifera*, *Ailanthus altissima* و *Prosopis juliflora*) إلا أنها تحولت مع مرور الزمن إلى نباتات غازية. وتناقش هذه الدراسة واقع الغزو بالأعشاب والتحديات المستقبلية على التنوع الحيوي، كما تناقش إدارة المكافحة المناسبة.

W 27

المكافحة الكيميائية للأعشاب في محصول القرنبيط (*Brassica oleracea var. Botrytis*) في غور الأردن. جمال راغب قاسم، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، ص.ب. 13282، الرمز البريدي 1942، عمان، الأردن، البريد الإلكتروني: jrqaesem@ju.edu.jo
تم إجراء تجربتين حقليتين لتقييم فاعلية عدد من مبيدات الأعشاب في مكافحة الأعشاب في محصول القرنبيط صنف وايت كلاود وذلك تحت ظروف غور الأردن خلال موسمي النمو 1997/1996 و 1998/1997. كانت الأعشاب الأكثر إنتشاراً هي الرمرا (133 نبات/م²) والخبيزة (38 نبات/م²) وأبو ركية (15 نبات/م²). في المتوسط، أدت منافسة الأعشاب لمحصول القرنبيط طوال موسم النمو إلى خفض في الوزن الجاف للأفرع الخضرية بمعدل 74.8% وفي أوزان الرؤوس المزهره بمعدل 77.3% مقارنة بالشاهد النظيف من الأعشاب. باستثناء مبيد اللينبيرون أحدثت كافة معاملات مبيدات الأعشاب ازدياداً في الوزن الطازج والجاف للأفرع الخضرية وللقرنبيط ووزن الرؤوس الزهرية وعددها مقارنة بالشاهد المعشب طوال فصل النمو. وأدت المعاملة ما قبل الزراعة بمبيد أوكسي فلوروفين بمعدل 2.5 ليتر للهكتار إلى الحصول على أعلى نمو للأفرع الخضرية ووزن للرؤوس الزهرية وكانت الأعلى في ذلك مقارنة بمعاملة الشاهد النظيف من الأعشاب. وكانت المعاملة بمبيدات DCPA (10 كغ/هكتار) وبنديميثالين (4.6 ليتر/هكتار) ونتروفين (1.4 ليتر/هكتار) ما قبل الزراعة وبمبيد أوكسي فلوروفين في معاملة ما بعد الزراعة فاعلة أيضاً في مكافحة الأعشاب وأدت إلى زيادة محصول الرؤوس الزهرية للقرنبيط مقارنة بمعاملات مبيدات الأعشاب الأخرى. وظهرت معاملة ما قبل الزراعة بمبيد الأوكسي فلوروفين هي الأفضل في مكافحة الأعشاب حيث خفضت الوزن الجاف للأفرع الخضرية بمعدل 65.5% من معاملة الشاهد المصاب بالأعشاب طوال موسم النمو. عملت المعاملات الأخرى لمبيدات الأعشاب على خفض كتلة الأعشاب بدرجة أقل منها في الشاهد المصاب بالعشب ولكن تأثيراتها كانت متباينة بشكل واضح. وبالرغم من أن بعض المبيدات مثل الدايفيناميد (7.5 كغ/هكتار) والبروناميد (2.5 كغ/هكتار) قد خفضت من نمو الأعشاب مقارنة بالشاهد المصاب بالأعشاب إلا أن ذلك لم ينعكس بشكل زيادة في الوزن

وإذا حدث هذا فقد استعملت خصائص أخرى للتفريق مثل دراسة الإنتاش. سمحت النتائج المتحصل عليها بتشكيل مجموعات من الأنواع تشترك في نفس الخصائص البذرية وكذلك التعرف على أهم الصفات التي تساعد على وصف البذور.

W 23

إنبات بذور بعض الطرز الحيوية لنبات الغيصلان (*Asphodelus tenuifolius*) بواسطة الحرارة والكيماويات الكاسرة لطور السكون. محمد اشفاق خان، جبل حسن، شهيدة بيبي وامتياز خان، قسم علوم الأعشاب، كلية الزراعة، بيشاور، باكستان 25000، البريد الإلكتروني: myboldimage@yahoo.ca

لطور السكون أهمية تمكن الأعشاب من البقاء في النظم الزراعية. أجريت تجربة على إنبات بذور الغيصلان (*Asphodelus tenuifolius*) في جامعة بيشاور الزراعية في باكستان، من أجل دراسة كسر سكون البذور بالكيماويات (KNO_3 ، GA_3 و sodium azide و thiourea) بتركيز من 0 إلى 800 جزء في المليون. تم تعريض البذور لدرجة حرارة 10، 20 و 30 °س. صممت التجربة بنظام العشوائي الكامل المتضمن المقاطع المجزأة بحيث كان المقطع الرئيس هو الحرارة، بينما كانت المقاطع تحت الرئيسة طرزاً حيوية وهي تشتمل على مقاطع تحت- تحت رئيسة وهي المركبات الكيماوية بينما المقاطع تحت-تحت رئيسة هو تركيزات المركبات الكيماوية والتي اشتملت على طبق بتري واحد يحتوي على 20 بذرة. وقد تم تحليل البيانات وفصل معدلات الإنبات باختبار أقل فرق معنوي (LSD). أظهرت النتائج أن الإنبات تأثر بجميع العوامل السابقة الذكر. تم الحصول على أعلى إنبات (47.41%) عند درجة حرارة 20 °س في كل الطرز، بينما كانت نسبة الإنبات 1.09% عند درجة حرارة 30 °س. كان أعلى معدل إنبات في طراز ميلوي (40.83%) مقارنة بنسبة الإنبات في الطرزين كرك و بكار (24.38 و 22.88%)، على التوالي). كان أعلى نسبة إنبات في الطراز ميلوي عند درجة حرارة 20 °س (96.13%)، وأعلى معدل نسبة إنبات في البذور المعاملة بـ KNO_3 و thiourea (62.25 و 58.0%)، على التوالي). أظهرت النتائج أن أثر الحرارة على الإنبات أكبر من أثر الكيماويات، والنتائج المتحصل عليها بحاجة إلى المزيد من البحث.

W 24

تأثير عمق مقطع التربة الزراعية في تعاقب ظهور أنواع الأعشاب الضارة مع المحاصيل اللاحقة. ندى البرني¹، غسان ابراهيم² وأنور المعمار². (1) الهيئة العامة للبحوث العلمية الزراعية، إدارة بحوث وقاية النبات، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: albarminada@hotmail.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، ص.ب. 30621، سورية.

تمت دراسة ديناميكية انتقال مخزون بذور الأعشاب الضارة في مقطع التربة 0-40 سم في موقعين جغرافيين مختلفين مدة ثلاث سنوات متتالية (1999، 2000 و 2001). استخدمت طريقة التطويق لفصل البذور من عينات التربة للتعرف على أنواع وأعداد البذور التي تشكل مخزون التربة. أظهرت النتائج انخفاضاً في عدد بذور الأعشاب الضارة في مقطع التربة الزراعية على العمق 20-40 سم مقارنة مع العمق 0-20 سم. وأن مخزون البذور في هذا العمق الأخير هو الذي يحدد أنواع الأعشاب التي ترافق المحصول اللاحق. تؤدي عملية الحراثة بعد الجني إلى قلب مقطع التربة في هذا العمق. تشير النتائج إلى وجود ارتباط وثيق ما بين إنبات البذور وعمق وجودها في التربة، كما وجد تبايناً كبيراً في التوزيع العشوائي لبذور هذه الأنواع في مقطع التربة (أفقياً وعمودياً) حسب العمق الذي توجد عليه كنتيجة لعمليات الخدمة. أمكن وضع مخطط خلال عدة سنوات لديناميكية انتقال مخزون بذور الأعشاب الضارة بين أعماق التربة المختلفة. تم اقتراح عدة معدلات (نرتييات) لتعاقب أنواع الأعشاب الضارة مع المحاصيل اللاحقة، تحقق هذه المعدلات سهولة في اختيار طريقة مكافحة الفعالة ومبيد الأعشاب المناسب. وتعدّ هذه المعطيات هامة في مراقبة درجة إصابة الحقل بالأنواع المختلفة من الأعشاب الضارة

W 25

تأثير معاملات مكافحة الأعشاب/الحشائش وميعاد نقل الشتلات على المحصول والمكونات الكيميائية الحيوية لمحصول البصل. حسن سالم¹، عبد القادر عبد الصمد¹، هاشم ابراهيم² و ابراهيم الأكل². (1) كلية الزراعة، جامعة القاهرة/ مصر؛ (2) المختبر المركزي لبحوث الحشائش، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: weedrc1@hotmail.com

يعتبر البصل (*Allium cepa*) ثالث محصول من حيث الأهمية بالنسبة لمحاصيل الخضر المنتجة في مصر. ونظراً لطبيعة نموه البطيئة بالإضافة لجذوره السطحية فإنه يتعرض لخسائر شديدة نتيجة منافسة الأعشاب/الحشائش له. هذا وقد أقيمت تجربة واحدة بالموسم الشتوي عامي 2001 و 2002 باستخدام تصميم القطع المنشقة. شملت معاملات مكافحة

W 19

الحشرات التي تهاجم الهالوك *Orobancha spp.* في محافظة السويداء، جنوبي سورية. وائل الممتني، قسم إدارة الآفات، مديرية وقاية النبات، وزارة الزراعة، دمشق، سورية، البريد الإلكتروني: almatni@scs-net.org
أجريت دراسة حقلية للتعرف على الحشرات التي تصيب أنواع الهالوك *Orobancha spp.* في محافظة السويداء ما بين أعوام 2002 و2006. كشفت الدراسة الحالية وجود 18 نوعا حشرياً تصيب الهالوك. تبين أن جميع الحشرات التي تصيب الهالوك هي حشرات متعددة العوائل ومعظمها يصيب محاصيل اقتصادية، باستثناء حشرة واحدة متخصصة بأنواع الهالوك هي سوسة الهالوك *Smicronyx sp. near fulvipes* (Colcoptera: Curculionidae)، التي سببت أكبر الضرر على الهالوك وأدت لموت النباتات المصابة في معظم الحالات في منطقة الدراسة. توافقت بعض أنواع الحشرات بأعدادها الحيوية مشكلة معقداً حشرياً على نباتات الهالوك.

W 20

المكافحة الكيميائية للهالوك *Orobancha crenata* و *O. aegyptiaca* في محصول العدس. بهاء الرهبان¹، نعيم الحسين² وفادي عبيد³. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية. دوما، ص. ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarpartect@mail.sy; (2) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث حلب، حلب، سورية؛ (3) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث إدلب، إدلب، سورية.

يتطفل الهالوك على العديد من المحاصيل ولا سيما العدس ملحقاً بها أضراراً اقتصادية مهمة، وبهدف التقليل من هذه الأضرار فقد تم تنفيذ تجربة لمكافحته كيميائياً باستخدام مبيد Imazapic وبتركيز مختلفة (2.5-10 غ مادة فعالة/هكتار) في موقعين الأول في ادلب والثاني في تل حديا على مدى موسمين زراعيين (2001/2000 و 2002/2001). وقد أدى استخدام هذا المبيد إلى مكافحة الهالوك بنسبة وصلت إلى 84.0% و 86.0% في كل من ادلب وحلب، على التوالي، الأمر الذي أدى إلى زيادة الغلة البذرية للعدس بنسبة 100.0% و 109.0% في الموقعين المذكورين، على التوالي.

W 21

أول تسجيل للهالوك (*Orobancha foetida* Poiret) على زراعة الحمص في المغرب. صفور قدور، المركز الجهوي للبحث الزراعي، ص. ب. 533، جيليز مراكش، المغرب، البريد الإلكتروني: ksaffour@yahoo.fr
يعد الهالوك (*Orobancha sp.*) آفة جد خطيرة بتطفله على جذور نباتات عدة مزروعة من ذوات الفلقتين وعلى الأعشاب. ويتطفل على البقوليات الغذائية والعلفية، وكذا النباتات من الفصيلة الخيمية (Apiaceae)، والبادنجانية (Solanaceae) والمركية (Asteraceae). كما أنه ينتشر كل سنة في أماكن جديدة في المغرب ويصيب أصنافاً لم تكن موبوءة من قبل. وتم إجراء مسح ميداني لحقول عدة في شمال المغرب سنة 2002 لتحديد مدى إصابة حقول البقوليات بهذا النبات الطفيلي. وقد أظهرت النتائج أن إصابة حقول الفول والعدس والبازلاء (الجلبانية) والحمص بالنوع (*O. crenata*) كانت على التوالي 80، 75، 90 و 54.5%. وتم تسجي النوع *O. ramosa /eagyptiaca* في حقل واحد من الفول، أما النوع *O. foetida* Poiret. الذي لم يسبق له أن سجل في المغرب إلا على أعشاب بعض أصناف (*Scorpiurus spp.* و *Medicago spp.*) في مناطق عدة بالمغرب (كالساييس، سيدي فاسم، سوق الأربعاء وتونان)، فقد وجد هذا النوع لأول مرة في هذا البحث متطفلاً على الحمص في أحد حقول سيدي فاسم. ورغم أن الإصابة لا زالت جد ضئيلة فإن خطر هذا النوع كبير جداً، ويتسبب حالياً في انخفاض مهم للمحاصيل بحقول الفول والحمص في تونس.

W 22

الخصائص الشكلية لبذور بعض الأعشاب الضارة بمحاصيل الحبوب. محمد فني، عادل نجيب شاكر ومريم هاني، مخبر تقييم الموارد الطبيعية، قسم البيولوجيا، كلية العلوم، جامعة فرحات عباس، الجزائر، البريد الإلكتروني: Fennimodz@yahoo.fr
تعّد النباتات المصدر الرئيس لغذاء الإنسان وخاصة الحبوب كالقمح، ويؤثر على مردوديتها منافسة الأعشاب الضارة لها والتي تسبب خسائر تتراوح بين 20 و 50%. ورغم الانتشار الكبير لهذه الحشائش واعتماد الجزائر على الحبوب بشكل أساسي إلا أن الدراسات في هذا المضمار ما زالت قليلة، وتكتسي دراسة الخصائص الشكلية لبذور الأعشاب الضارة أهمية استثنائية من الناحيتين العلمية والاقتصادية. قمنا بمعالجة معطيات 89 عاملاً هي الخصائص الشكلية للبذور: الشكل (F)، اللون (C)، الحجم (V)، اللمعان (B)، الملوسة (S)، الصلابة (D)، الطول (L)، العرض (LG)، القطر (DM) ووزن 1000 حبة (P)، واتبعت طريقة التصنيف التدرجي المتصاعد وطريقة التحليل العاملي للتناسب. وكان عدد الخصائص الشكلية المعتمدة كثيرة لهذا كانت مجموعات الأنواع صغيرة، ولا يمكن لتوعين حتى لو كانا من نفس العائلة أن يشتركا في كل الخصائص،

W 17

مساهمة في دراسة الهالوك المتفرع *Orobancha ramosa* L. في الساحل السوري: الانتشار العوائل والدور المحتمل لذبابة الهالوك *Phytomyza orobanchia* Kalt. في مكافحته حيويًا. حنان حبيق¹، محمد أحمد² وبهاء الرهبان³. (1) مركز البحوث العلمية الزراعية باللاذقية، هيئة البحوث العلمية الزراعية بدمشق، سورية؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية؛ (3) هيئة البحوث العلمية الزراعية، دوما، دمشق، سورية، البريد الإلكتروني: ensafakel@hotmail.com

أجري مسح للعديد من الحقول الزراعية والبيوت المحمية في الساحل السوري خلال المواسم الزراعية 2003/2002، 2004/2003 و 2005/2004. بهدف تحديد مناطق انتشار الهالوك المتفرع وعوائله النباتية في المنطقة وتحديد الحشرات المتطفلة والمتغذية عليه. جمعت عينات الهالوك المتفرع بشكل عشوائي من بعض الحقول والبيوت المحمية المصابة، وفحصت العينات حيث تم تشريح الأفرع والكبسولات الثمرية للهالوك وجمعت منها الحشرات المتطفلة. بلغ مجموع الأفرع المفحوصة 526 فرعاً ومجموع الكبسولات المفحوصة 4537 كبسولة. ينتشر الهالوك المتفرع في مناطق الساحل السوري المدروسة وحتى ارتفاع 1500 م عن سطح البحر، حيث ينتشر في اللاذقية في العديد من المواقع الزراعية في جيلة منها البرجان، حميميم، رأس العين، وفي عين الوادي (صلنفة)، وفي طرطوس في عدة مواقع منها يحمور، القدموس، الشريكيش. وقد وجد متطفلاً على عشرة أنواع نباتية تابعة لفصائل مختلفة: كالبندورة/الطماطم، البانجان، التبغ (من العائلة البانجانجانية Solanaceae) الخيار (من العائلة القرعية Cucurbitaceae)، الفول (من العائلة البقولية Fabaceae)، وعلى نوعين من نباتات الزينة. بينت النتائج أيضاً انتشار ذبابة الهالوك *Phytomyza orobanchia* Kalt. ووجودها طبيعياً في معظم المواقع المدروسة المصابة بالهالوك المتفرع على نباتات البندورة داخل البيوت المحمية وبنسب إصابة اختلفت من موقع لآخر تراوحت بين 6.66-100% على أفرع نباتات الهالوك وبين 0-98.51% على الكبسولات الثمرية للبذور.

W 18

البكتيريا الجذرية المثبطة والمحقرة للنمو: إمكانية جديدة لإدارة الهالوك. نجية زرمان¹، ثريا سويس² ويورقن كروشال³. (1) فرع علم النبات، المعهد الوطني للعلوم الزراعية (INA)، 1 شارع حسن بادوي، الحراش، 16200، الجزائر، البريد الإلكتروني: n.zermane@ina.dz؛ (2) مختبر علم النبات، المعهد الوطني للعلوم الزراعية لتونس (INAT)، 43 شارع شارل نيكول، 1082 تونس - مهرجان، الجمهورية التونسية. (3) فرع إدارة النبات المتكاملة، المركز الدولي للبطاطا [CIP]، شارع لامولينا 1895، غرفة رقم 1558، ليما 12، البيرو.

تم عزل بكتيريا المجموع الجذري لنبات الفول وقيمت كفاءة 337 عزلة في مكافحة الحيوية لكل من *O. crenata* و *O. foetida*. بعد إنتقاء مبدئي استعمل فيه إختبار بادرات الخس *Lactuca sativa* seedling bioassay. تم إختيار 37 عزلة بكتيرية كان لها تأثيراً مثبتاً لنمو بادرات الخس و 18 عزلة ذات تأثير محقر للنمو. عند إختيار بكتيريا النوع الأول على المراحل الأولى لنمو نبات الهالوك باستعمال الغرف الجذرية *root chambers*، حققت 70% و 84% من العزلات المختبرة إنخفاضاً معنوياً للمراحل الأولى لنمو كل من *O. foetida* و *O. crenata* على التوالي. من بين 5 عزلات منتقاة لإختبارات أجريت في الأصص، كانت العزلة 9-Bf7 *Pseudomonas fluorescens* الأكثر كفاءة في مكافحة كلا النوعين من النبات المتطفل. فلقد تسببت في انخفاض لعدد نباتات كل من *O. foetida* و *O. crenata* بمقدار 63% و 76% ولوزنهما الجاف بمقدار 39% و 63%، على التوالي مقارنة بالشاهد غير المعامل. واحتلت العزلات 1-2-Nc1 و 9-Bzf1 *P. marginalis* المرتبة الثانية من حيث الفاعلية لكل من *O. foetida* و *O. crenata*، على التوالي. كما سببت العزلات البكتيرية الخمس المختبرة إنخفاضاً معنوياً في نسبة إنبات بذور *O. crenata* وصلت إلى 84% عند إعداء البذور خلال فترة التكييف المسبق. أما البكتيريا الجذرية التي أظهرت نشاطاً محفزاً فلقد تم تقييم فعاليتها في إحداث و/أو تحفيز إنبات بذور *O. crenata*. ولقد بينت النتائج قدرة 10 من أصل 15 عزلة مختبرة على تعزيز الأثر المحفز للإفرازات الجذرية لنبات العدس مما نتج عنه ارتفاع نسبة إنبات بذور *O. crenata*، وبلغت 43% بعد المعاملة بالعزلة Bzc76 *Ralstonia pickettii*. ولم تكن لأي عزلة من العزلات المختبرة القدرة على إحداث الإنبات في غياب الإفرازات الجذرية. ولم تكن العزلة Bzc76 قادرة على تحفيز إنبات بذور الهالوك فحسب، بل إحداث زيادة معنوية بمقدار 48% لمسافة حدوث الإنبات. كما بينت نتائج تجربة أجريت في الأصص، أن استعمال نفس العزلة البكتيرية مع نبات البرسيم الحجازي (*Trifolium alexandrinum* L.) نتج عنه انخفاض معنوي لمخزون بذور *O. crenata* وبالتالي انخفاض إصابة نبات الفول المزروع ملحفاً، بالنبات المتطفل. وهكذا، حدث إنخفاض معنوي لعدد نباتات الطفيل وكذا وزنه الجاف قدرا بنسب 80% و 70%، على التوالي مقارنة بالشاهد الموبوء بالهالوك فقط.

(*Cuscuta campestris* Yunk.) النامي على الجت/الفصة (*Medicago sativa* L.)، وقد وجد بأن لمستخلصات السفرندة (*Sorgham halepense* L.) والقصب البري (*Phragmitis comunis* L.) والحلفا (*Imperata cylindrica* L.) أعلى تأثير إبادي في الحامول. وسبب المزيج (زيت الغاز + 10% زيت محركات) لوحده أو بداخله مع مستخلصات الأعشاب أعلى درجة قتل في نباتات الحامول. معظم المعاملات كان لها تأثير إيجابي في نمو نباتات الجت/الفصة بعد مرور 45 يوماً من الإضافة.

W 15

المكافحة الكيماوية للهالوك (*Orobancha crenata* Forsk.) في حقول البازلاء. صفور قدور¹، محمد أوعمو² وعبد الواحد معطوي³. (1) المركز الجهوي للبحث الزراعي ص.ب. رقم 533 جيليز مراكش، المغرب، البريد الإلكتروني: ksaffour@yahoo.fr؛ (2) المركز الجهوي للبحث الزراعي بمكناس، المغرب؛ (3) المدرسة الوطنية للفلاحة مكناس، ص.ب. س/14، المغرب.

تحتل البازلاء حوالي ربع المساحة المخصصة للبقوليات بالمغرب (87000 هكتارا). ويعتبر الهالوك (*Orobancha crenata* Forsk.) من أهم المعوقات التي تحد من إنتاج هذه الزراعة، بحيث يمكن أن يصل انخفاض الإنتاج إلى 100% في حالة الإصابة المرتفعة. يهدف هذا البحث، الذي أجري في موسم 2004/2005 بمحطة تجارب المعهد الوطني للبحث الزراعي بالضواحي (المغرب) والمبوءة طبيعياً بالهالوك، إلى دراسة مدى فاعلية المبيدات الكيماوية في مكافحة هذا الطفيل في زراعة البازلاء (صنف Douce de Provence). استعملت المواد التالية مرة في مرحلة التصاق درنات الهالوك بجذور البازلاء ومرة أخرى بعد أسبوعين وذلك بنفس المقادير: (أ) الكليفوزات بمقادير 40 و 60 غ.م.ف./هـ، (ب) السلفوزات بمقادير 80 و 100 غ.م.ف./هـ و (ج) الإيمازبيك بمقدار 5 غ.م.ف./هـ، وترك شاهد من غير مبيد. كما استعمل المبيد الأخير لمرة واحدة بجرعة 10 غ.م.ف./هـ أثناء التصاق الدرنات. باستثناء الإيمازبيك الذي استعمل بجرعة 10 غ.م.ف./هـ لمرة واحدة الذي كان أقل فاعلية، أدت كل المبيدات إلى انخفاض ملموس في عدد سوق الهالوك بنسبة 84 إلى 98% ومادته الجافة بنسبة 73 إلى 97%. وقد تراوحت نسبة التسمم من 0 إلى 2.2 تبعاً لمقياس 0-9، حيث 0 يعني عدم التسمم و 9 موت النبات. وبهذا ارتفع الإنتاج من حبوب البازلاء من 67 إلى 114% مقارنة بالشاهد.

W 16

دلالات على تحمل بعض مجتمعات العدس البري من الأردن للإصابة بالهالوك. بركات أبو ريميلة¹ ونصري حداد². (1) قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: barakat@ju.edu.jo؛ (2) قسم البستنة والمحاصيل، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: nhaddad@ju.edu.jo

تم اختبار مدى قابلية 24 خطاً وراثياً من العدس البري جمعت من الأردن وصنفتين منزرعين للإصابة بالهالوك في تجربة أصص داخل الدفيئة الزجاجية. تم خلط أوزان متساوية من أربعة أصناف هالوك: *O. crenata*، *O. aegyptiaca*، *O. ramosa* و *O. cernua* في وعاء خلطاً جيداً واستخدم ذلك الخليط مصدراً للعدوى. كان معدل العدوى من الخليط 1 غ بذور للأصيص الذي يحتوي على لبيتر واحد من البيتموس. لقد اعتبر كل خط وراثي معاملة واحدة وقد تباين عدد المكررات لكل معاملة من 8-16 مكرر (أصيص لكل مكرر). لقد تم إجراء التحليل الإحصائي لكل من الأوزان الجافة لكل من المجموع الخضرس والجذور لنبات العدس والهالوك، وكذلك عدد التصاقات الهالوك بجذور العدس. وقد تم تقدير مدى احتمال حساسية العدس للإصابة بالهالوك بناء على المقياس التالي: متحمل جداً (عدد الالتصاقات + الخطأ القياسي للمعدل = 0.1-1)، متحمل (عدد الالتصاقات + (SE) = 1.1-2)، حساس (عدد الالتصاقات + (SE) = 2.1-3)، حساس جداً (عدد الالتصاقات + (SE) = أكثر من 3). دلت النتائج على أن أصناف العدس المنزرعة (الأردن 1 و الأردن 2) أكثر الأصناف حساسية للإصابة بالهالوك، وأن الخطوط الوراثية UJ6، UJ24 و UJ5 متحملة للإصابة بالهالوك، وأن الخطوط الوراثية UJ3، UJ4، UJ7، UJ9، UJ11، UJ12، UJ14 و UJ19 حساسة للإصابة بالهالوك. أما باقي الخطوط الوراثية فكانت حساسة جداً للإصابة بالهالوك. لقد كان درجة ارتباط الإصابة مع الأوزان الجافة للمجموع الخضري والجذور ارتباطاً معنوياً عالياً (معامل الارتباط $r = 0.76$ و 0.848 ، على التوالي). تدل النتائج على وجود درجات تحمل عالية للإصابة بالهالوك، إلا أن هذا الافتراض بحاجة إلى المزيد من البحث.

المبيدات المستخدمة في مكافحة الأعشاب الرفيعة تفوقت على الشاهد غير المعشب، وكانت ذات كفاءة عالية في مكافحة الشوفان البري (*Avena fatua* و *A. sterilis*) خلال الموسمين، وتراوحت بين 75.25 و 100% في دير الزور و -78.78- 99.3% في القامشلي. وتفوقت كل المبيدات (Sulfosulfuron، Idosulfuron sodium 30 غ/هـ + Mesosulfuron methyl 30 غ/هـ + Mefenpyr dithyl 90 غ/هـ، Clodina-fop 240 غ/هـ + Cloguinctocet 60 غ/هـ) على المبيد Flucarbazon Sodium بالنسبة لعشبة ذيل الهر (*Phalaris paradoxa* و *P. minor*)، وبلغت 100% بالنسبة لمبيد Sulfosulfuron و 45.89% بالنسبة لمبيد Flucarbazon Sodium. بالنسبة للأعشاب العريضة فقد كانت كافة المبيدات فعالة في مكافحتها، وتفوقت جميعها على الشاهد غير المعشب خلال الموسمين ولم تظهر فروقات معنوية بين المبيدات، وبلغت 97.62% في دير الزور و 100% في القامشلي. بينت النتائج عدم وجود أعراض سمية على محصولي الشوندر السكري والقطن في دير الزور خلال موسمي الدراسة، بينما ظهرت أعراض سمية واضحة على العدس والحمص في القامشلي لكل المبيدات المستخدمة عدا الخليط (Clodina-fop 240 غ + Cloguinctocet 60 غ) تمثلت باصفرار شديد وتقرم النباتات وظهور الأوراق الإبرية وعدم الوصول إلى طور النضج.

W 12

المنافسة البيئية لاصناف القمح المقزم والطويل مع الشوفان البري. أيجز أحمد خان وجول حسان، قسم علوم الأعشاب، جامعة بيشاور، باكستان، البريد الإلكتروني: ijazahmadk@hotmail.com
أجريت تجربة حقلية في محطة أبحاث مالكاندر في مقاطعة NWFP في الجامعة الزراعية في بيشاور خلال موسم 2004/2005 لدراسة أثر تداخل الشوفان البري مع أصناف قمح مختلفة. تضمنت التجربة ستة أصناف قمح (Khattakwal، Ghaznavi-98، Fakhar-e-sarhad، Dera-91، Saleem-2002 و Pirsabak-85) وزعت في أربعة مكررات بنظام القطع الكاملة العشوائية. تم زراعة الشوفان البري بمعدل 9 نباتات شوفان في المتر المربع في جميع المقاطع. أخذت القراءات على عدد الاضطاء في المتر المربع، طول النبات، طول السنبل، عدد السنبيلات في السنبل، عدد الحبوب في السنبل، وزن الألف حبة، عدد إسطاء الشوفان البري، عدد بذور الشوفان في الفرع من الشوفان البري، الناتج الحيوي وانتاج الحب. تأثرت جميع القراءات بوجود الشوفان البري. كان أعلى معدلات للقراءات المختلفة في صنف القمح Saleem-2002 حيث بلغ عدد الاضطاء 273.5 في المتر المربع، عدد السنايل 272.3 في المتر المربع، عدد السنبيلات 18 في السنبل، طول السنبل 9.32 سم، وكان انتاج الحب 2638 كغ في الهكتار. كان طول النبات 119.3 سم والانتاج الحيوي 7137 كغ في الهكتار لصنف Khattakwal. لقد أدى الصنفين Saleem-2000 و Ghaznavi 98 إلى تثبيط نمو الشوفان بدرجة كبيرة، مدلا على أن طول النبات ليس المقياس الوحيد للتدليل على مدى المنافسة بين الأصناف.

W 13

أثر كثافة الشوفان البري (*Avena fatua*) على إنتاج ومكونات إنتاج القمح المروي في بيشاور. جول حسان وأيجز أحمد خان، قسم علوم الأعشاب، جامعة بيشاور، باكستان، البريد الإلكتروني: hassanpk_2000pk@yahoo.com
أجريت تجربة حقلية في محطة أبحاث مالكاندر في مقاطعة NWFP في الجامعة الزراعية في بيشاور خلال ربيع 2004/2005 لدراسة أثر كثافة الشوفان البري على إنتاج ومكونات إنتاج القمح. وقد شملت المعاملات الرئيسية أربعة معدلات بذار (100، 130، 160 و 190 كغ/هكتار) في المقاطع الرئيسية، وسبع كثافات من الشوفان (0، 5، 10، 15، 20، 25 و 30 نبات/م²) في المقاطع الصغرى باستخدام تصميم القطع المنشقة. أخذت القراءات على عدد السنايل/م²، طول السنبل، وزن ألف حبة قمح، والإنتاج. أظهر التحليل الإحصائي أن جميع مكونات الإنتاج تأثرت بكل من معدل البذار وكثافة الشوفان. وكان أعلى معدل لعدد السنايل/م² (2189)، ولطول السنبل (9.3 سم) ولعدد الحب في السنبل (30.26) عندما كانت كثافة الشوفان صفر. وتبين أن أعلى معدل لعدد السنايل كان 238.4 سنبلة/م² وطول السنبل 8.58 سم، ووزن الألف حبة 30.87 غ عندما كان معدل البذار 160 كغ/هكتار. ويوصى باستخدام هذا المعدل لتقليل أعداد الشوفان البري في القمح.

W 14

مكافحة الحامول (*Cuscuta campestris* Yunk) النامي على الجت/الفصة بواسطة المبيدات وبعض المستخلصات النباتية. باقر عبد الجبوري وعلي فدعم المحمد، قسم علوم المحاصيل الحقلية، كلية الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: wisam_ali2004@yahoo.com
نفذ هذا البحث في حقل كلية الزراعة، أبو غريب ولموسمين، بهدف دراسة إمكانية استخدام المستخلصات النباتية لبعض الأعشاب السائدة في العراق وبعض المواد الكيميائية المتوفرة محليا والتداخل بينها في مكافحة الحامول

النبات حسب التعليمات التي شملتها البطاقة التقنية لكل مبيد، وتم تقييم بعض معايير كل من النبات المتطفل والمحصول (القمح الطري) لمعرفة مدى الحماية التي يوفرها كل مبيد، وانعكاس ذلك على مردود المحصول. بينت النتائج المتحصل عليها أن مردود القمح يتأثر سلباً بتطفل نبات البروم. كما أن فعالية المبيدات المختبرة كانت ضعيفة باستثناء مبيد TLANTIS الذي سجل نتائج نوعاً ما مرضية.

W 9

تقييم إنتاج القمح ومكوناته تحت تأثير المنافسة من العشب *Descurainia sophia* (L.) Webb. أرش روزبهاني¹، علي فردينيا، محمد علي باغستاني² وقربان نورمحمدی¹. (1) قسم الهندسة الزراعية، جامعة آزاد الإسلامية، طهران، إيران، البريد الإلكتروني: aroozbahani@gmail.com؛ (2) قسم بحوث علوم الأعشاب، معهد وقاية النبات، طهران، إيران.
يعدّ القمح أحد أهم المحاصيل التي تزرع لإنتاج الغذاء في العالم، ويزرع على نطاق أوسع من غيره من المحاصيل. تنافس الأعشاب بما فيها عشب *Descurainia sophia* النبات على الماء والعناصر الغذائية وتؤدي إلى تقليل الإنتاج ومكوناته. ولقد تم إجراء تجربة لدراسة أثر منافسة هذه العشب في ثمانية أصناف من القمح (Azadi, Karaj2, Roshan, Tabasi)، في المتر المربع، بينما زرعت الأصناف بالمعدلات المثالية. ولقد رتببت المعاملات في نظام احصائي عاملي بأربعة مكررات. لقد تم أخذ قراءات الإنتاج (كغ/هكتار)، وعدد السنابل في المتر المربع، وعدد الحبوب في السنبل ووزن ألف حبة، وتم تحليل النتائج وفصل المتوسطات باختبار دنكن على مستوى 5%. أظهرت النتائج وجود فروق معنوية بين الأصناف في الإنتاج وفي دليل الحصاد، ولم تسجل فروقات معنوية في عدد السنابل في المتر المربع ووزن ألف حبة. وكان صنف Niknejad أكثرها منافسة مع العشب، وكان الصنف Roshan أقلها منافسة.

W 10

الفترة الحرجة لمكافحة الأعشاب الضارة في الذرة الصفراء في العراق. شوكت عبد الله المشهداني¹، نزار نومان العنبيكي²، عبد الجبار جاسم²، فردوس محمد رشيد² ومزهر لفته². (1) قسم وقاية النبات، كلية الزراعة، جامعة الأنبار، العراق، البريد الإلكتروني: showkatabdulah@yahoo.com؛ (2) الهيئة العامة للبحوث الزراعية، أبو غريب، بغداد، العراق.
الفترة الحرجة لمكافحة الأعشاب الضارة (CPWC) هي الفترة من عمر المحصول التي يجب خلالها مكافحة الأعشاب الضارة لمنع الفقد غير المقبول في الحاصل. ولتحديد هذه الفترة في محصول الذرة الصفراء في العراق، فقد تم تنفيذ ثلاث تجارب حقلية خلال ثلاثة مواسم (الربيعي 2004، الخريفي 2004 والربيعي 2005) في محطة أبحاث المحاصيل الحقلية التابعة للهيئة العامة للبحوث الزراعية في أبو غريب، 30 كم غرب بغداد. تم خلالها إزالة الأعشاب الضارة المرافقة للذرة الصفراء لفترات 1، 2، 3، 4، 5، 6، 7، 8، 9 و 10 أسابيع من إنبات المحصول، تركت بعدها الأعشاب تنافس المحصول لباقي موسم النمو. تم اعتماد نسبة الفقد 5% في حاصل بذور الذرة الصفراء كأساس لتحديد الفترة الحرجة وهي النسبة المقبولة اقتصادياً على أساس الدراسات السابقة. بينت نتائج المواسم الثلاث أن هذه الفترة تقع ما بين الأسبوع السابع والثامن بعد بزوغ بادر الذرة الصفراء إذ انخفض حاصل البذور من 3.13 طن/هكتار في الألواح/القطع الخالية من الأعشاب لطول موسم النمو إلى 2.95 طن/هكتار للمعاملات التي تركت فيها الأعشاب مع المحصول لفترة 7-8 أسابيع بعد الإنبات، في حين أن منافسة الأعشاب للذرة الصفراء لطول موسم النمو سببت خفضاً مقداره 57.8%. وعلى أساس نتائج هذه الدراسة، يجب استخدام مبيدات الأعشاب ذات الأثر المتبقي الفعال للأسابيع السبعة الأولى بعد الإنبات أو تنفيذ طرق مكافحة الأخرى خلال هذه الفترة لتجنب الفقد غير المقبول في حاصل الذرة الصفراء.

W 11

تقويم كفاءة بعض المبيدات العشبية الحديثة في مكافحة الأعشاب الضارة في حقول القمح. علي شاكر¹، بهاء الرهبان¹، محمد أكرم بقله¹، عمران يوسف²، حليم يوسف² و خليل الحسين³. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarpartect@mail.sy؛ (2) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث القامشلي؛ (3) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث دير الزور، دير الزور، سورية.

نفذت التجارب في مركز البحوث العلمية الزراعية بدير الزور والقامشلي خلال المواسم 2002-2004، وقد هدفت الدراسة إلى تقويم كفاءة بعض المبيدات الحديثة خلال الموسمين 2002 و 2003 وإلى دراسة الأثر المتبقي لهذه المبيدات المستخدمة على المحاصيل الزراعية اللاحقة التي تزرع بنفس التربة المعاملة بهذه المبيدات خلال موسمي 2003 و 2004 وذلك بزراعة الشوندر السكري/البنجر والقطن بدير الزور والحمص والقامشلي بعد القمح. بينت النتائج أن كفاءة

W 6

كثافة وتوزع بعض أنواع الحشائش/الأعشاب في حقول الشعير بالمشروع الزراعي للنهر الصناعي العظيم بمنطقة سرت-ليبيا. ناصر عمر الشخي¹ ومحمد الدراوي العائب². (1) قسم النبات، كلية العلوم، جامعة التحدي، ليبيا، البريد الإلكتروني: wasqi2003@yahoo.com؛ (2) كلية الزراعة، جامعة التحدي، سرت، ليبيا، البريد الإلكتروني: adrawi2002@yahoo.co.uk

تهدف هذه الدراسة إلى حساب كثافة وتوزع بعض أنواع الحشائش/الأعشاب النامية في حقول الشعير بالمشروع الزراعي للنهر الصناعي العظيم التابع لجهاز استثمار مياه النهر وذلك لتوفير قاعدة بيانات يمكن استخدامها في تقدير الخسائر التي تسببها الحشائش، بالإضافة إلى لفت الانتباه إلى الأهمية الاقتصادية للحشائش بالمشروع وتطوير طرق مكافحتها. بينت الدراسة أن أعلى الأنواع كثافة من بين 71 نوعا تم حساب كثافتها وتوزعها كانت: *Lolium rigidum* (24.96 نبات/م²)، *Melilotus indicus* (19.29 نبات/م²)، *Emex spinosus* (5.7 نبات/م²)، *Cutandia dichotoma* (3.68 نبات/م²) و *Bromus rigidus* (3.61 نبات/م²)، وكانت كثافة الأنواع المتبقية أقل من نبات/م². كما بينت الدراسة أن الحشائش/الأعشاب الأكثر انتشارا (توزعا في الحقول)، هي: *Melilotus*، *Rhaponticum acaule*، *Hussonia pinnata*، *Brassica tournefortii*، *Senecio gallicus* و *indicus* حيث تم تسجيلها في جميع الحقول المدروسة (100%)، وتم تسجيل *Emex spinosus* في 96% من الحقول المدروسة و *Centaurea dimorpha* في 91% من الحقول المدروسة. وتراوحت نسب توزع الأنواع المتبقية ما بين 4.50 و 86.36%.

W 7

التوزع الجغرافي للأعشاب الضارة بمحاصيل الحبوب في الهضاب العليا السطايفية - الجزائر. عادل نجيب شاكر، محمد فني ومريم هاني، مختبر تقييم الموارد الطبيعية، قسم البيولوجيا، كلية العلوم، جامعة فرحات عباس، الجزائر، البريد الإلكتروني: Chakeran@yahoo.fr

يعدّ غزو الأعشاب الضارة لحقول القمح والشعير من أكبر المشكلات التي تواجه الزراعة في العالم لما تسببه من خسائر في المنتج. تنتشر هذه الأعشاب في الهضاب العليا السطايفية، والتي تشكل المساحة المستغلة لإنتاج الحبوب حوالي 80% من مجمل الأراضي الزراعية فيها. ولهذا تم دراسة انتشار أهم أنواع الأعشاب في هذه المنطقة والتي تقع شمال شرق الجزائر بين خطي طول 5° و 6° شرق خط غرينتش، وبين خطي عرض 35° و 36° و 35° شمال خط الاستواء. تم تقسيم منطقة الدراسة إلى 3 مناطق رئيسية، هي: المنطقة الشمالية (جبلية) والمنطقة الوسطى والمنطقة الجنوبية، تتميز بمناخ قاري شبه جاف، حار صيفا وقارس ممطر شتاء. تم الحصول على قائمة بالأعشاب الضارة تضم 56 نوعا تنتمي إلى 49 جنسا و 21 عائلة. حيث لوحظ أهمية كل من العائلات: المركبة، النجيلية، البقولية، الخيمية والصليبية. تم إنشاء خرائط لتوزع 30 نوعا وهي من أهم أو أكثر الأعشاب الضارة توزعا في منطقة الدراسة، حيث تنتشر بنسب مختلفة تتراوح بين أقل من 20% كقيمة دنيا و 80% كقيمة قصوى، ولهذا فإن هناك أنواع تشكل خطرا على المزروعات نظرا للنسب الكبيرة التي تتواجد بها. فمثلا وجدت الأنواع: *Calendula arvensis*، *Ranunculus arvensis*، *Papaver rhoeas* و *Anacyclus clavatus*، بالإضافة إلى أنواع أخرى في كل مناطق الدراسة دون استثناء، وبنسب مختلفة حيث يكثر انتشارها في المنطقة الشمالية التي تتراوح بها النسب تقريبا من 60 إلى 80%، وتتناقص هذه النسب كلما إتجهنا جنوبا فتتراوح بين 20 و 40%. بينما تتواجد بعض الأنواع بطريقة عشوائية، غير منتظمة، وتوجد في كل من المناطق الثلاث وبنسب مختلفة.

W 8

دراسة مقارنة لفاعلية بعض المبيدات العشبية تجاه نبات البروم (*Bromus sp.*) الطفيلي. نورة عليوي¹، فوزي شايب¹، محمد خلفاوي¹ وعبد القادر بن بلقاسم². (1) قسم البيولوجيا، جامعة 8 ماي 1945، قالمة 24000، الجزائر، البريد الإلكتروني: alloui_24@yahoo.fr؛ (2) المعهد التقني للمحاصيل الكبرى الخروب، قسنطينة 25000، الجزائر.

يعتبر نبات البروم (*Bromus sp.*) أحد أهم النباتات التي تتطفل على محاصيل الحبوب والتي تسبب خسائر فادحة في إنتاجية أو مردود القمح بالجزائر. وتستهدف الدراسة الحالية إيضاح دور أربعة مبيدات عشبية أتلنتس: TLANTIS (*Mefenpyr-diethyl + Iodosulfuron-methyl-sodium + Mesosulfuron-methyl*) الذي تم استعماله في طور 2 إلى 3 أوراق من نمو النبات المتطفل بجرعة 500 غ/هكتار، أوكسان ب: IILLOXAN B (*Bromoxynil + Diclofop-methyl*) الذي تم استعماله في طور 2 إلى 6 أوراق من نمو النبات المتطفل بجرعة 4 لبيتر/هكتار، توبيك: TOPIK 080 EC (*Clodinafop-propargyl*) الذي تم استعماله في طور 3 إلى 4 أوراق من نمو المحصول بجرعة 0.8 لبيتر/هكتار وسيوفيكس مزوج الفعالية: SUFFIX D.A. (*Flamprop-Isopropyl + MCPA hormone*) الذي استعمل في طور الإشتاء من نمو المحصول بجرعة 6 لبيتر/هكتار، في المكافحة الكيميائية لهذه الآفة الخطيرة. تمت المعالجة في مراحل مختلفة لنمو

الزراعة بتقاوي/بيذار قمح نظيف، إعطاء رية سابقة للزراعة مرة أو مرتين (حراثتي) متبوعاً بالحرق، زراعة القمح بالتبادل مع البرسيم، إجراء مكافحة الكيماوية للأعشاب/للحشائش رقيقة وعريضة الأوراق، النقاوة اليدوية مرتين في الفترة بين 30-60 يوم من الزراعة، أدى إلى تقليل كثافات الأعشاب/الحشائش ورفع القدرة الإنتاجية لمحصول القمح. تم إيضاح فائدة المكافحة المتكاملة لعشبة/لحشيشة الزمير للمزارعين وللمرشدين الزراعيين وأخصائي مكافحة الأعشاب/الحشائش من خلال 53 تجربة حقلية تأكيدية Verification trials تم تنفيذها في 230 موقع بمراكز مختلفة لإثنتي عشر محافظة. أوضحت نتائج 950 مشاهدة حقلية موزعة على 14 محافظة في حقول مصابة بشدة بعشبة/بحشيشة الزمير خلال المدة من 1992-2002 أن تطبيق توصيات الحزمة المتكاملة لمكافحة الزمير في القمح أدى إلى انخفاض كثافة الزمير بأكثر من 90% مع زيادة في إنتاجية القمح ما بين 56-68% مقارنة بالحقول التي تجرى بها العمليات الزراعية المعتادة. إن التطبيق السنوي لحزمة المكافحة المتكاملة ضروري حتى تكون الإصابة بالزمير تحت السيطرة مع استدامة إنتاج القمح في مصر. لذلك تبنت وزارة الزراعة حزمة التوصيات بتطبيقها في مساحة 20.000 هكتار بحقول القمح المصابة بشدة بالزمير موسم 2004/2005 ومساحة 40.000 هكتار موسم 2005/2006. أوضحت الدراسات الاقتصادية والاجتماعية أن استخدام حزمة توصيات مكافحة الزمير في القمح أدت إلى زيادة الدخل القومي بمقدار 119 مليون دولار خلال الفترة من 1992 حتى 2002.

W 4

مكافحة نبات السوس (*Glycyrrhiza glabra* L.) في حقول القمح البعلية بمبيدات الأعشاب في ثلاث مراحل نمو في إيران. م. فيسي¹ و.ج. راحميان². (1) مركز البحوث الزراعية في كرمنشاه، ص.ب. 1661-67145، إيران، البريد الإلكتروني: movassi2002@yahoo.com؛ (2) معهد بحوث حشرات وأمراض النبات، طهران، إيران. ينتشر نبات السوس كعشبة مستديمة في محاصيل مختلفة وخاصة في المناطق المطرية في إيران. تم دراسة فاعلية معاملة مبيدات أعشاب في ثلاث مراحل نمو لنبات السوس أثناء موسم الإراحة في الدورة الزراعية مع القمح. تم إجراء التجربة في محطة الأبحاث الزراعية في مهيداشت وسراود التابعة لكرمنشاه خلال الفترة 2002-2004 بنظام احصائي عملي بتوزيع القطاعات العشوائية الكاملة والذي يتكون من عاملين. العامل الأول هو المعاملة بمبيدات الأعشاب التالية: (1) خليط من 2 و 4-د + م س ب 1 بمعدل 1.32 + 2.68 كغ مادة فعالة للهكتار، (2) بكلورام بمعدل 0.24 كغ مادة فعالة للهكتار، (3) خليط من 2 و 4-د + م س ب 1 + بكلورام بمعدل 0.14+2.01+0.99 كغ للهكتار، و (4) معاملة شاهد غير معامل. أما العامل الثاني فهو أطوار نمو نبات السوس التالية (ارتفاع 20-25 سم أي حوالي طور الورقة السادسة، طور الأزهار وطور تكون القرون). وفي الموسم الثاني تم زراعة القمح في مكان التجربة وبدون إجراء عمليات رش المبيدات. تم أخذ نتائج عدد نباتات السوس وأوزانه الجافة قبل الحصاد وكذلك ناتج المحصول. أظهرت النتائج أن المعاملة بمبيد 2 و 4-د + م س ب 1 في طور تكون القرون أدت إلى خفض أعداد نبات السوس بنسبة 97.83% في الإراحة. وأن المعاملة بالمبيدات في طور القرون أفضل من المعاملة في طور الإزهار وأقل مكافحة كانت المعاملة في طور 6 ورقات. أدت المعاملة بمبيد 2 و 4-د + م س ب 1 إلى أفضل مكافحة لنبات السوس من حيث عدد النباتات والوزن الجاف، وزادت إنتاج القمح بنسبة 26.2% مقارنة مع الشاهد.

W 5

الأثر التنافسي لحشيشة الشوفان البري (*Avena ludoviciana* L.) على إنتاج ومكونات إنتاج أصناف القمح. محمد أرمين¹، غ. نور محمدي²، ي. زاندي³، م.أ. باغستاني³ و ف. دارفيس². (1) جامعة آزاد الإسلامية، فرع سابزيفار، إيران؛ (2) فرع البحوث والعلوم، جامعة آزاد الإسلامية في طهران، إيران؛ (4) معهد أمراض وأفات النبات، طهران، إيران، البريد الإلكتروني: moharmin@iaua.ac.ir، moh_armin@yahoo.com. تم إجراء تجربة حقلية في محطة الأبحاث التابعة لمعهد آفات النبات والأمراض النباتية في كارج لدراسة الأثر التنافسي لحشيشة الشوفان البري على صنفين من القمح (Rooshan و Niknejad) في إنتاج ومكونات الإنتاج. تم اختبار ثلاث كثافات زراعة مختلفة من القمح (المعدل الموصى به، المعدل + 25% والمعدل + 50%) وأربع كثافات شوفان بري (0، 25، 50، و 75 نبات/م²). وزعت المعاملات على أربع مكررات في تصميم احصائي عملي. أظهرت النتائج أن إنتاج الصنف Niknejad (الصنف الأكثر تنافسية) أعلى من إنتاج الصنف Rooshan (الأقل تنافسية) وذلك في معاملات معدل البذار العالية بسبب زيادة الأفرع الخصبة. أدت زيادة معدل البذار إلى زيادة في ارتفاع النبات، عدد السنابل، وعدد البذور وكذلك زيادة الإنتاج في المتر المربع. وأدت زيادة كثافة الشوفان البري إلى تخفيض الإنتاج عند كلا الصنفين.

W 1

أثر التغيرات المناخية في منافسة عشبة الشوك المقدس (*Silybum marianum Gaertn.*) على القمح. محمد عزيم خان
وخان باحادار ماروات، قسم علوم الأعشاب، جامعة بيشاور، باكستان، البريد الإلكتروني: ahmadzaipk@yahoo.com
بما أن هناك اهتمام متزايد بالنسبة للفرضية التي تنص على أن زيادة كثافة المحصول تخفض من نمو الأعشاب، فقد
تم اجراء تجارب لدراسة مدى منافسة عشبة الشوك المقدس (*Silybum marianum Gaertn.*) مع القمح تحت ظروف بيئية
مختلفة. شملت التجارب أربع معدلات بذار قمح (280، 336، 392 و 448 بذرة/م²) في المقاطع الرئيسية، وسبع كثافات من
العشبة (0، 3، 6، 9، 12، 15 و 18 نبات/م²) في المقاطع الصغرى باستخدام تصميم القطع المنشقة خلال الموسمين
الزراعيين 04/2003 و 05/2004. لقد أدت زيادة معدل البذار إلى تثبيط كبير في نمو العشبة في السنة الأولى، ولكن نمو
العشبة لم يتأثر في الموسم الثاني بزيادة معدل البذار بسبب ظروف زيادة هطول الأمطار وانخفاض درجة الحرارة التي
ساعدت في زيادة نمو العشبة. أدت زيادة كثافة المحصول أو العشبة إلى خفض معدل إنتاج النبات الواحد من بذور العشبة،
وذلك تبعاً لمعدل البذار وكثافة العشبة والسنة. وازدادت كمية الضوء المعترضة من نباتات المحصول والعشبة في السنة الثانية
مقارنة مع السنة الأولى نتيجة النمو الكبير لنباتات العشبة. وكانت عشبة الشوك المقدس أكثر منافسة في السنة الثانية نتيجة
الظروف المناسبة لنموها وتطورها. وبناء عليه، فإن معدلات البذار وكثافة العشبة لم تكونا مقياساً دقيقاً لمدى منافسة العشبة
وتقدير الخسائر في المحصول، وأنه لا بد من اعتبار مقدار الهطول ودرجة الحرارة عند بناء نموذج ما. ويمكن لمعدل بذار
القمح الأمتل (336 بذرة/م²) أن يساهم في تخفيض مقدار الخسارة في الإنتاج، وأن يمنع العشبة من إنتاج البذور في
استراتيجية طويلة الأمد لمكافحةها. وعلى كل حال، فإنه يمكن استخدام هذا الفهم في اطار مكافحة المتكاملة.

W 2

مدى تدخل عشبة الشوك المقدس (*Silybum marianum Gaertn.*) بكثافات مختلفة مع القمح. محمد عزيم خان وخان
باحادار ماروات، قسم علوم الأعشاب، جامعة بيشاور، باكستان، البريد الإلكتروني: ahmadzaipk@yahoo.com
تم اجراء تجارب حقلية في بيشاور - باكستان خلال الموسمين الزراعيين 04/2003 و 05/2004 باستخدام التوزيع
العشوائي في تصميم القطع المنشقة. تضمنت المقاطع الرئيسية معدلات بذار القمح (100، 120، 140 و 160 كغ/هكتار)،
بينما شملت المقاطع الصغرى معاملات كثافات عشبة الشوك المقدس (*Silybum marianum Gaertn.*) (0، 3، 6، 9، 12،
15 و 18 نبات/م²). ظهرت عشبة الشوك المقدس أكثر منافسة في السنة الثانية عنها في السنة الأولى بسبب الزيادة غير
المعتادة لهطول الأمطار (140 و 317 مم، على التوالي للسنة الأولى والثانية)، والتي أثرت في انتاجية القمح ومكونات الإنتاج.
كان مقدار خفض إنتاج القمح أكبر في معاملات معدل البذار الأقل. ودلت النتائج على أن مقدار الخفض في الإنتاج يعتمد على
كثافة العشبة والمحصول. وكان تفسير النتائج أفضل باستخدام الوزن الجاف للعشبة. كانت كمية الضوء المعترضة أكبر كلما
زادت كثافة المحصول والعشبة، ولم يكن لكثافة العشبة أكثر من 6 نبات/م² أي أثر في كمية الإضاءة المعترضة. تم الحصول
على أكبر الأوزان الكلية الطازجة والجافة للقمح في معاملات معدلات البذار 120 و 140 كغ/هكتار. ولقد كان أكبر وزن كلي
(الطازج والجاف) للعشبة في معاملات معدل بذار للقمح الأقل. لقد كانت قيم جميع الصفات المحصولية أقل كلما زادت كثافة
العشبة أو المحصول. لقد تم تسجيل أكبر قيم للصفات الخضرية والتكاثرية للعشبة خلال السنة الثانية، وتم الحصول على أكبر
إنتاج قمح في معاملات معدل البذار 120 كغ/هكتار. تناسب مقدار إنتاج البذور في العشبة مع وزن العشبة الكلي الذي كان
معتمداً على معدل بذار القمح، فكلما كان معدل البذار أكبر كلما كان وزن العشبة أقل. ومع هذا فقد كان هناك إنتاج بذور عال
في العشبة في معاملات أعلى معدل بذار قمح. ولهذا فإن زيادة كثافة المحصول لوحدها لا تخفض نمو العشبة أقل من مستوى
العتبة. كان خفض إنتاج القمح بشكل رئيس بسبب خفض عدد الإسطاءات المنتجة في النبات الواحد. لقد اختلفت كثافة العشبة
التي تخفض إنتاج القمح باختلاف الكثافة وموسم النمو.

W 3

الخبرة المصرية في مجال مكافحة المتكاملة لعشبة/لحشيشة الزمير في حقول القمح. زكريا رفاعي يحيى والحسانين
الشربيني حسانين، المختبر المركزي لبحوث الحشائش، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني:
weedrc1@hotmail.com
يعاني القمح في مصر من مشاكل الحشائش/الأعشاب خاصة الفلارس - الصامة - الزمير بالإضافة إلى بعض
الأعشاب/الحشائش عريضة الأوراق مسبباً نقصاً حاداً في المحصول، مما يفرض الاحتياج للإدارة المتكاملة لمكافحة
الأعشاب/الحشائش لحل هذه المشكلة من خلال دراسة عدة اختيارات مختلفة لوسائل المنع، الطرق الزراعية، دورة التعاقب
المحصولي واستخدام مبيدات الأعشاب/الحشائش الموصى بها حديثاً. كما أخذ في الاعتبار أيضاً الظروف الاقتصادية
والاجتماعية للمجتمعات الزراعية من أجل الحصول على حزمة مناسبة للإدارة المتكاملة للأعشاب/للحشائش في القمح. تم
إقامة 35 تجربة حقلية بمحطات البحوث في الفترة من 1992 - 2002. أسفرت هذه الدراسات عن أن تكامل العمليات التالية:

أعشاب ضارة

المناطق القريبة من طرابلس خصوصاً في المرازيق وسوق السبت وسوق الخميس، مما أدى إلى خسائر فادحة في محصول البطاطا أثناء التخزين وعدم توفر تقاوي سليمة للزراعة في العروة الخريفية. ونظراً لإعتماد بعض مزارعي البطاطا في بعض المناطق المستصلحة على الحصول على التقاوي من الأسواق بطرابلس ولعدم وجود أي نوع من الحجر الزراعي الداخلي للآفة المذكورة فقد اتسع نطاق الإصابة بنيماتودا القرع إلى ضواحي مدينة سرت على بعد 400 كم شرق مدينة طرابلس، وقد وصلت الكثافة العددية في بعض الحقول إلى 460 نيماتودا/100 غ تربة.

في رفع متوسطات الصفات الخضرية والإنتاجية لكلا الصنفين المختبرين، وكانت المعاملات معنوية فقط في متوسطات ارتفاع النباتات والإنتاج، وسجل أعلى وزن في الإنتاج على الصنف Supermarmand بمتوسط 4.06 كغ وعلى الصنف Riogrande 2.25 كغ، مقارنة بالشاهد بمتوسط 0.68 و 3.03 كغ لصنفي الطماطم/البندورة Riogrande و Supermarmand، على التوالي. وقد لوحظ انخفاض في ظهور بعض الحشائش وغياب البعض الآخر في معاملات التشميس مقارنة بالشاهد .

N 26

التعقيم البيولوجي للتربة باستخدام الفجل الزيتي. هيام إبراهيم، ماهر مصري وعماد إسماعيل، المؤسسة العامة للتبغ، دائرة الأبحاث في جب حسن، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: kaisgazal@shufbc.com
نفذت تجربة تعقيم التربة بيولوجيا في موقع دائرة الأبحاث في جب حسن باللاذقية التابع للمؤسسة العامة للتبغ، باستخدام الفجل الزيتي "صنف BOSS" مهجن خصيصاً لهذه الغاية (تهجين متعدد الجينات) يُطلق غاز الميتيك وهو الغاز نفسه الذي ينتج عن مادة الداوميت. نفذت التجربة خلال الفترة 2004-2006 بالمقارنة مع استخدام الفجل البلدي (لم يجر عليه أي تهجين) وبوجود شاهد غير معامل. زرعت قطع التربة التجريبية ببذور الفجل بنسبة 3 غ/م² في 2004/4/14 (الزيتي والعادي)، قطعت النباتات وطمرت في التربة على عمق 30 سم بعد شهر ونصف من الزراعة أو عند طول النبات حوالي 40 سم. ثم غطيت التربة بالبلاستيك (بولي إيثيلين سماكة 100 ميكرون) لمدة 10 أيام، كما حُرثت تربة الشاهد غير المعاملة وغطيت. بعد رفع الأغشية وتهوية التربة زرعت بشتول تبغ ماريلاند. أخذت قراءات لأعداد أفراد النيماتودا *Meloidojyne sp.* في التربة (قبل زراعة الفجل، شهر بعد الزراعة، بعد التعقيم ورفع الغطاء). أخذت نسبة إصابة جذور التبغ بنيماتودا العقد الجذرية في نهاية الموسم (الشهر العاشر). أخذت قراءات أعداد الأعشاب (الأعشاب ذات الأوراق العريضة والتي هي أكثر تواجداً)، الإصابات الفطرية تعفن التاج الأسود، فيوزاريوم خلال موسم نمو التبغ، وقدر الإنتاج في نهاية الموسم. أعداد أفراد النيماتودا قبل زراعة الفجل كان في القطعة المخصصة للفجل الزيتي 850 فرد/م² ولفجل العادي 980 فرد/م² وللشاهد 1108 فرد/م² أما بعد تقطيع الفجل وفرمه وتغطيته وبعد إزالة الغطاء فقد أصبحت في الزيتي 450 فرد/م² في العادي 1366 فرد/م² في الشاهد 1900 فرد/م² أما الأعشاب كانت في الزيتي 30/م² وبقيت بعد التعقيم 30 /م² أمال عادي كانت 24 /م² وأصبحت 36/م² وفي الشاهد كانت 28/م² وأصبحت 122/م² تعفن التاج الأسود لم تظهر في الزيتي والعادي ظهرت إصابات قليلة في في الشاهد .

N 27

أجناس النيماتودا النباتية المتلازمة مع بعض نباتات الزينة في مدينتي البيضاء وبنغازي (ليبيا). محمود اكريم الحويطي، جامعة عمر المختار، كلية الزراعة، قسم وقاية النبات، ص.ب. 119، البيضاء، ليبيا، البريد الإلكتروني: goody3cot@yahoo.com

تصاب نباتات الزينة بعدة آفات ومنها النيماتودا، ونظراً لأهمية نباتات الزينة في الحدائق العامة والمنزلية، لهذا أجري هذا المسح لمعرفة أجناس النيماتودا المتلازمة مع بعض نباتات الزينة التي تزرع في الحدائق وكذلك معرفة الكثافة العددية لها. جمعت عينات من التربة مع الجذور من نباتات الزينة (250 غ) من عمق 20-30 سم، وتم استخلاص النيماتودا بواسطة الغرابيل وأقماع بيرمان. تم قتل النيماتودا وتثبيتها بواسطة محلول FGA بنسبة 1:1:4 (fromaldehyd: glycerin: acetic acid) وتم نزع الماء حسب طريقة Seinhost المعدلة وحضرة شرائح منها وتم تعريف الأجناس المختلفة من النيماتودا بواسطة مفتاح التقسيم وتحت المجهر الضوئي. تم التعرف على الأجناس الآتية: *Acrobeles*, *Cephalobus*, *Discolaimus*, *Dorylaimus*, *Eudorylaimus*, *Helicotylenchus*, *Hoplotaimus*, *Rhadinus*, *Rotylenchus*, *Pratylenchus*, *Trichodorus*, *Tylenchus*, *Tylenchorhynchus* و *Xiphinema*.

N 28

انتشار مرض يصيب البطاطس/البطاطا متسبب عن نيماتودا التفرح *Pratylenchus sp.* بالمناطق الغربية من ليبيا. خليفة حسين دعباج¹، عياد إبراهيم الحاجي² وامحمد محمد الصول². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح طرابلس، ليبيا، البريد الإلكتروني: dabajhk@yahoo.com؛ (2) مركز البحوث الزراعية، طرابلس، ليبيا.

لوحظ خلال المواسم الزراعية من 2000/2001 إلى 2005/2006 نتيجة فحص عينات درنات البطاطس/البطاطا من محصول العروة الربيعية المخزنة بطريقة الأنفاق التقليدية لحين زراعتها في العروة الخريفية، وجود تقرحات بنية غائرة تكون صغير الحجم في بداية الإصابة ثم تزداد اتساعاً لتغطي مساحة كبيرة من الدرنة. تبين من الفحص المجهرية أن الإصابة ناتجة عن نيماتودا التفرح *Pratylenchus sp.* التي لم تكن فيما سبق تشكل خطورة على زراعة البطاطس/البطاطا في مناطق زراعتها في ليبيا، إلا أن هذه الآفة أصبحت في السنوات الأخيرة من أهم الآفات التي تهدد زراعة البطاطس/البطاطا في

N 23

تقدير حد الضرر لنيماتودا تعقد الجذور علي نبات الطماطم/البندورة تحت الظروف الحيوية المختلفة. أحمد محمد كريم
ومعوض محمد محمد محمد، قسم أمراض النبات، المركز القومي للبحوث، شارع التحرير، الدقي، القاهرة، مصر، البريد
الإلكتروني: kor_asm@yahoo.com

تمت دراسة العلاقة بين كثافة مجتمعات نيماتودا تعقد الجذور (*Meloidogyne incognita*) وبين إنتاجية صنفين من
أنصاف الطماطم/البندورة الحساسة للإصابة بالنيماتودا وهما سوبر سترين B وسوبر مارمند خلال موسمين متتالين (2004
و 2005) وذلك بغرض تقدير النسبة المئوية للفاقد في المحصول نتيجة الإصابة وكذلك تقدير الحد الحرج للضرر وحدود
التحمل تحت الظروف الحقلية. أوضحت الدراسة أن هناك علاقة ارتباط سلبية ومعنوية بين الإنتاج وبين الكثافة العددية الأولية
للنيماتودا، وكانت المستويات المنخفضة من النيماتودا 10 و 100 فرد/نبات محفزة لنمو الطماطم/البندورة من الصنف سوبر
سترين B. وكان الصنف سوبر سترين B أكثر تحملا للإصابة بالمقارنة مع الصنف سوبر مارمند، وبلغ حد التحمل لصنف
سوبر سترين B 1600 و 1000 فرد/نبات في موسمي 2004 و 2005، على التوالي. بينما كان حد التحمل لصنف سوبر
مارمند 85 و 65 فرد/نبات لنفس الموسمين، على التوالي. وأدى إضافة السماد البلدي المتحلل للتربة بمعدل 20:1 حجماً لحجم
إلى زيادة قدرة تحمل الطماطم/البندورة من الصنف سوبر مارمند للإصابة، فارتفع حد التحمل من 65 فرد/نبات عند زراعته
في أرض غير مضاف إليها السماد البلدي إلى 120 فرد/نبات عند الزراعة في أرض مضافاً إليها السماد البلدي.

N 24

تعريف بعض العشائر الإيرانية من نوعي نيماتودا تعقد الجذور (*Meloidogyne spp.*) الأكثر شيوعاً بإيران باستخدام تقنية
PCR-RFLP. إ. مهدي خان مغادام¹، أ. خيرى²، و م. محمدي². (1) قسم وقاية النبات، كلية الزراعة، جامعة فردوزي
مشهد. ص.ب. 91775-1163، إيران؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة طهران، كراج، إيران، البريد
الإلكتروني: mahdikhani_e@yahoo.com

تم استخلاص المحتوى الكلي للحمض النووي DNA من بيض ويرقات الطور الثاني لعشائر إيرانية مختلفة من
نوعي نيماتودا تعقد الجذور الأكثر شيوعاً في إيران (*M. javanica* و *M. incognita*) باستخدام طريقة الفينول/كلوروفورم.
وبعد ذلك تم إجراء الفصل الكهربائي للحمض النووي المستخلص على ألواح 1% أجاروز جيل لتحديد نوعيته وكميته. تم
استخدام زوج خاص من البادئات (الباديء C2F3 بطول 23 نيوكليوتيد، والباديء 1108 بطول 20 نيوكليوتيد) وذلك للتمييز
بين عشائر النوعين *M. javanica* و *M. incognita* باستخدام تفاعل البلمرة المتسلسل (PCR). وقد وجد أن مواقع التصاق
البادئات تقع عند الطرف رقم 3 من جين الميتوكوندريا الخاص بإنتاج إنزيم cytochrome oxidase subunit II (COII)،
وعند جين RNA الرسول 16S. وبعد إكثار الحمض النووي DNA في إختبار تفاعل البلمرة المتسلسل تم إجراء الفصل
الكهربائي له، وأوضح إختبار الفصل الكهربائي وجود قطعة تقدر بألف وسبعمائة قاعدة (1.7 كيلو قاعدة 1.7 kb) في عشائر كلا
النوعين من نيماتودا تعقد الجذور (*M. javanica* و *M. incognita*). وأسفرت عملية هضم القطع ذات الألف وسبعمائة قاعدة
باستخدام إنزيم Hinfl restriction endonuclease عن وجود قطعتي DNA قدرهما 700 و 1000 قاعدة في النوع
M. javanica، وثلاث قطع قدرها 300، 400، و 1000 قاعدة في النوع *M. incognita*. ولم تكن هناك أية فروقات في
أنماط الهضم بين العشائر المختلفة داخل كل نوع من النوعين المختبرين. وبذلك أمكن لإختبار PCR-RFLP أن يميز كلا
النوعين من النيماتودا عن الآخر.

N 25

استخدام الطاقة الشمسية في مكافحة نيماتودا تعقد الجذور (*Meloidogyne javanica* و *M. incognita*) وتأثيرها في نمو
وإنتاجية صنفين من الطماطم/البندورة في منطقة الكفرة-ليبيا. إدريس عبد الرحيم سليمان، محمود كريم الحويطي ومحمد
علي سعيد، قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، ص.ب. 919، البيضاء، ليبيا، البريد الإلكتروني:
goody3cot@yahoo.com، aasa2080@yahoo.com

أجريت تجربة حقلية لتقييم استخدام تسميس التربة بأغطية اللدائن الشفاف في مكافحة نيماتودا تعقد الجذور
(*Meloidogyne javanica* و *M. incognita*) وتأثيرها في نمو وإنتاجية صنفين من الطماطم/البندورة Riogrande
و Supermarmand في منطقة الكفرة (جنوب شرق ليبيا). أظهرت النتائج أن معاملة التسميس بأغطية اللدائن بعد 45 يوماً من
التغطية، أعطت نتائج جيدة في تقليل الكثافات النيماتودية، ووصلت إلى 80% مقارنة بالشاهد دون تغطية، وكذلك خلال فترتي
الحصاد، أي بعد 75 و 120 يوماً من الزراعة، وكانت 70% على الصنف Riogrande، و 78% على الصنف
Supermarmand. وأثرت معاملة التسميس فقط في تقليل عدد الإناث وكتل البيض على كلا صنفَي الطماطم/البندورة بمتوسط
4.06 و 6.64 مقارنة بالشاهد 14.29 و 7.64 على Riogrande و Supermarmand، على التوالي. كما كان لها تأثير واضح

الجرعة الأعلى (8 طن للفدان) إلى زيادة معنوية في الإنتاج وصلت إلى 39% مقارنة بمحصول معاملة الشاهد (دون أي إضافة).

N 20

مكافحة نيماتودا تعقد الجذور *Meloidogyne incognita* على العنب باستخدام بعض الأسمدة العضوية والمركبات الحيوية. سوزان حسوب¹ الهام زينهم² ومحمد الشيخ². (1) قسم أمراض النبات، الشعبة الزراعية والبيولوجية؛ (2) قسم الفاكهة، المركز القومي للبحوث، ص.ب. 2311، الدقي، جيزة، مصر، البريد الإلكتروني: susan.hasabo@yahoo.com تم إختبار تأثير اثنتان من الأسمدة العضوية (مخلفات الماشية والدواجن)، وسماد كبريتي معدني والمركب الحيوي بيونيما (المحتوي على بكتيريا *Bacillus penetrans*) مقارنة بالمبيد النيماتودي (كاربوفوران 10% محبب) في مكافحة نيماتودا تعقد الجذور *M. Incognita* على العنب صنف "طومسون سيدلس" تحت الظروف الحقلية. أدت جميع المعاملات المستخدمة إلى خفض ($P \leq 0.05$) الكثافة العددية للنيماتودا خصوصاً في نهاية التجربة (شهري أيار/مايو وحزيران/يونيو 2004)، كما أدت أيضاً إلى زيادة ($P \leq 0.05$) إنتاج الثمار مقارنة بالنباتات غير المعاملة.

N 21

مكافحة نيماتودا تعقد الجذور والأمراض المنقولة بالتربة على الطماطم/البندورة باستخدام تقانة التطعيم على الأصول المقاومة أو المتحملة. صلاح الشعبي¹، أسامة قطيفاني¹، محمد حسام صافية¹، صبحية العربي¹، جورج أسمر². (1) إدارة بحوث وقاية النبات، (2) مركز البحوث العلمية الزراعية في طرطوس، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص ب 113، دمشق، سورية، البريد الإلكتروني: gcsarshaabi@mail.sy

تحدث نيماتودا تعقد الجذور *Meloidogyne spp.* والأمراض المنقولة بالتربة أضراراً كبيرة بنباتات الطماطم/البندورة المزروعة في البيوت البلاستيكية في محافظة طرطوس (سورية)، وتعدّ طريقة التطعيم على الأصول المقاومة أو المتحملة إحدى الطرق الواعدة في مكافحة هذه الأمراض. وفي هذه الدراسة، تراوحت نسب توافق بعض الأصول المقاومة، مثل: ألدرادو، وهيمان، وبيوفورت، وفايجوماكس مع بعض أصناف الطماطم/البندورة المعتمدة، مثل: ديماء، وستيلا، وجيروندا، وأمل، والمحلي ما بين 84.4 و 100% عند تطعيمها بطعم واحد، وما بين 35.4 و 66.7% عند تطعيمها بطعمين، بينما تراوحت نسب توافق الأصل البري للطماطم/البندورة بالأصناف المذكورة ما بين 41.7 و 44.9%. وتراوحت كفاءة النباتات المطعمة على الأصول المستوردة في مكافحة نيماتودا تعقد الجذور في البيت البلاستيكي الملوّث بأنواع نيماتودا تعقد الجذور *M. arenaria*، *M. incognita* و *M. javanica* ما بين 70.9 و 100%، بينما كان الأصل البري قابلاً للإصابة. وانخفضت مقاومة هذه الأصول لنيماتودا تعقد الجذور بصورة عامة مع زيادة عدد الطعوم على الأصل الواحد. أوضحت الدراسة أيضاً انخفاض الإصابة بنيماتودا تعقد الجذور في نباتات الشاهد بعد تكرار زراعة البيت البلاستيكي نفسه بالنباتات المطعمة لأربعة مواسم متتالية، بينما أصيبت الأصول نفسها بنيماتودا تعقد الجذور (كسرت مقاومتها) عندما زرعت في تربة ملوثة بالنوع *M. hapla*. وأظهرت الأصول بيوفورت، وهيمان، وفايجوماكس مقاومة شديدة تجاه مرض الجذر الفليني (100%)، ولكن انخفضت مقاومتها عندما طعمت بطعمين بدلاً من طعم واحد، بينما كان الأصل ألدرادو ونباتات الأصناف المطعمة عليه بما فيها الصنف المحلي متوسطة الحساسية. وتراوحت نسب الزيادة في متوسط إنتاج النبات المطعم بطعم واحد ما بين 5.5 و 70.5%، والمطعم بطعمين ما بين 5.9 و 55.4%.

N 22

كفاءة بعض بدائل بروميد الميثايل في مكافحة النيماتودا المتطفلة نباتياً المصاحبة للقرنفل في البيوت البلاستيكية. خالد العيس، قسم وقاية النبات، جامعة دمشق، دمشق، سورية، ص.ب. 30621، دمشق، سورية، البريد الإلكتروني: khaledalass@hotmail.com

تمت دراسة فاعلية بروميد الميثايل واثنين من بدائله في خفض الكثافة العددية للنيماتودا المتطفلة نباتياً المصاحبة لنباتات القرنفل، وتأثير ذلك في إنتاجية النباتات من الزهور في بيتين بلاستيكيين مساحة كل منهما 400 م² في منطقة الزيداني (دمشق، سورية). تضمنت التجربة المعاملات التالية: معاملة التربة قبل الزراعة ببروميد الميثايل (28 غ/م²)، أو بخار الماء، أو الميثام صوديوم (75 سم³/م²) بالإضافة إلى الشاهد غير المعامل للمقارنة. أوضحت النتائج قدرة جميع المعاملات في خفض الكثافة العددية للنيماتودا المتطفلة على النباتات مقارنة بالشاهد. وكان للمعاملة ببخار الماء تأثير واضح في تحفيز النمو الخضري والتكبير في موعد الأزهار، ولكن المعاملة بميثام الصوديوم حققت أعلى إنتاجية بين جميع المعاملات، وبلغ متوسط عدد الأزهار للمعاملات الثلاث والشاهد 28.3، 23.9، و 32.8 و 23.8 زهرة/ في كل يوم قطاف، على التوالي.

N 17

استخدام بعض المواد العضوية وغير العضوية في مكافحة نيماتودا تعقد الجذور *Meloidogne javanica* في الباذنجان. سليمان ناناف عمي ومخير عبد الحميد حزام سعيد الشرجبي، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: Sulaimanami@yahoo.com

اختير 8 مواد عضوية و 3 مواد غير عضوية لإختبار تأثيرها في نيماتودا تعقد الجذور *M. javanica* على الباذنجان. أشارت النتائج إلى أن أعلى تثبيط للفقس (83.6%) ظهر عند وضع البيوض في راشح مسحوق أوراق الخروع، وأقلها عند غمرها في راشح سماد السوبرفوسفات الثلاثي، كما وجد أن أكبر عدد من اليافاعات (96.2%) قد مات عند غمرها في راشح مسحوق أوراق النعناع بينما مات أقلها (1.14%) عند معاملة براشح سماد سوبرفوسفات الثلاثي. كذلك تبين عند إضافة المواد العضوية إلى التربة الملوثة بالنيماتودا قبل إسبوع من زراعة الباذنجان صنف "التون كوبري" في البيت البلاستيكي أن مخلفات الأغنام قد تفوقت على المخلفات الحيوانية الأخرى في التأثير على النيماتودا عند استخدامها بتركيز 4.5%، كذلك وجد أن مسحوق أوراق النعناع كان من أفضل المواد العضوية النباتية كفاءة في التأثير على النيماتودا عند التركيز ذاته، بينما كان مسحوق أوراق الفجيلة أقلها كفاءة. تباينت المواد العضوية والسماد الكيماوي NPK في تأثيرها على النيماتودا ولكنها لم تؤثر سلبيا في النباتات السليمة عند تركيزها المناسب.

N 18

حصر أجناس النيماتودا والميكوريزا الداخلية المرافقة لجذور الباذنجان في ريف دمشق. أسما حيدر¹، خالد العسس² وكمال الأشقر³. (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دمشق، دوما، دمشق، سورية، البريد الإلكتروني: esraaha77@yahoo.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، سورية؛ (3) قسم علم النبات، كلية العلوم، جامعة دمشق، سورية.

يعدّ نبات الباذنجان من الخضار العشبية الهامة اقتصاديا على المستوى العالمي، وتعتبر النيماتودا من الآفات المهمة اقتصاديا والتي تسبب خسائر كبيرة بالإنتاج تصل إلى 50%، حيث يصيب نبات الباذنجان أنواع مختلفة من النيماتودا أهمها نيماتودا تعقد الجذور. بينت نتيجة المسح الحقلّي لـ 65 عينة ترابية جمعت من حقول الباذنجان في محافظة ريف دمشق خلال عام 2004 وجود إصابة بنيماتودا تعقد الجذور في 28 عينة (43.07%)، كما وجدت في العينات أجناس متطفلة أخرى هي: *Tylenchorhynchus*، *Pratylenchus*، *Paratylenchus*، *Helicotylenchus*، *Ditylenchus*، *Rotylenchus*، *Longidorus*، *Xiphenema*، *Aphelenchus*، *Aphelenchoides* و *Tylenchus*. بالإضافة إلى الأجناس الحرة التالية: *Cephalobus*، *Eucephalobus*، *Panagrolaimus*، *Chiloplacus*، *Rhabdtophora*، *Rhabdsetis*، *Dorylaimus*، *Eudorylaimus*، *Mononchus*، *Monhystera*، *Pelodera*، *Acrobolus* و *Aporcelaimus*. تستخدم فطريات الميكوريزا الداخلية في زيادة وتحسين نمو المحصول وزيادة مقاومته لبعض الأمراض، وبين المسح الحقلّي لـ 84 عينة ترابية جمعت من حقول الباذنجان في محافظة ريف دمشق لموسم 2004 وجود 6 أجناس تابعة لفطريات الميكوريزا الداخلية (*Glomus*، *Gigaspora*، *Endogone*، *Entraphospora*، *Modicella*)، وكان الجنس *Glomus* هو الأكثر انتشارا حيث وجد في 82 عينة (97.61%)، تلاه الجنس *Gigaspora* في 71 عينة (84.52%).

N 19

فعالية كسب الكاتولا في مكافحة نيماتودا تعقد الجذور *Meloidogyne incognita* على الطماطم/البندورة تحت الظروف الحقلية. هدى حسين أمين ومعوذ محمد بندق، قسم أمراض النبات، المركز القومي للبحوث، الدقي، الجيزة، ص.ب. 12311، مصر، البريد الإلكتروني: hoda_ameen@yahoo.co.uk، moawadbondok@yahoo.com

تتسبب النيماتودا المتطفلة على النباتات في خسائر فادحة للمحاصيل وتعدّ الطماطم/البندورة من أكثر المحاصيل حسسية للإصابة بنيماتودا تعقد الجذور على وجه الخصوص. وقد سبب الاستخدام المتواصل للمبيدات الكيماوية لمكافحة نيماتودا تلوثا للبيئة وأضرارا لصحة الإنسان، مما دفع الباحثين إلى محاولة اكتشاف بدائل أكثر أمنا لمكافحة النيماتودا. ويعدّ التسميد العضوي ببقايا النباتات التي تنتج عند تحللها في التربة موادا سامة للنيماتودا إحدى هذه الوسائل، ومن أهم هذه النباتات تلك التي تتبع العائلة الصليبية وينتج عن تحللها مادة الجليكوسينولات التي تتحطم إلى المادة السامة أيزوثيوسيانات. وقد أجريت هذه التجربة لتقييم فاعلية استخدام كسبة بذور الكاتولا في مكافحة نيماتودا تعقد الجذور *M. incognita* على نباتات الطماطم/البندورة صنف "سوبر استرين ب" تحت الظروف الحقلية، حيث أضيفت ثلاثة مستويات من الكسب (4، 6، و 8 طن/للفدان) كتسميد عضوي قبل الزراعة في تربة ملوثة بنيماتودا تعقد الجذور *M. incognita*. أوضحت النتائج أن المعاملات الثلاث قد خفضت ($P \leq 0.05$) أعداد النيماتودا في التربة والجذور، وكذلك أعداد العقد النيماتودية على الجذور. وقد أدت

Rotylenchulus reniformis في موقع واحد بدير الزور، فيما تكرر وجود نفس الأجناس مع تقدم نمو النبات. وكان جنسي نيماتودا تعقد الجذور والتقرح *Meloidogyne*، *Pratylenchus* المسيطرين في معظم العينات المصابة، حيث بلغ متوسط الكثافة العددية النيماتودية 280 و 42 في 10 غ جذور نباتات مصابة، على التوالي.

N 15

المكافحة المتكاملة لنيماتودا تعقد الجذور على نباتات البندورة والخيار في البيوت المحمية في الساحل السوري. منهل البلخي وفصل الفرواتي، قسم بحوث النيماتودا، إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: manhal1951@yahoo.com

تتعرض الخضراوات في البيوت المحمية في الساحل السوري للإصابة بنيماتودا تعقد الجذور *Meloidogyne* spp. والتي تؤدي إلى خسائر فادحة نظرا لتوفر الظروف المناسبة لها من حرارة ورطوبة وتربة رملية بالإضافة لتعذر تطبيق الدورة الزراعية. طبقت عناصر مكافحة المتكاملة في تجارب مستمرة في الهيئة العامة للبحوث العلمية الزراعية منذ عام 1984 للسيطرة على هذه الآفة وذلك باستخدام المبيدات الكيماوية، التشميس، الإضافات العضوية، مكافحة الحويية، وطرائق أخرى. وقد أعطت المبيدات الكيماوية المختلفة فاعلية تراوحت بين 60-80%، بينما كانت كفاءة التشميس تحت غطاء بلاستيكي لمدة 45-60 يوما نحو 70%، ولم تتجاوز فعالية عناصر مكافحة الأخرى 60%، يتضح أن تطبيق هذه العناصر مجتمعة أو منفردة قد أدى إلى خفض الكثافة العددية لنيماتودا تعقد الجذور من جهة، وترشيد استخدام المبيدات وحماية البيئة من جهة أخرى، وبالتالي الحصول على منتجات زراعية آمنة وخالية من التلوث.

N 16

حصر النيماتودا المتطفلة نباتياً ومرض الذبول الفيوزاريومي المصاحبين لنباتات العدس في سورية. محمد فرحان إسماعيل¹، محمد هشام الزينب² وأحمد الأحمد². (1) مركز البحوث العلمية الزراعية في الرقة، الرقة، سورية، البريد الإلكتروني: m_f_ismail@hotmail.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية.

أجري حصر للنيماتودا المتطفلة نباتياً النيماتودا ومرض الذبول الفيوزاريومي المصاحبين لنباتات العدس في المناطق الرئيسية لزراعته في محافظتي حلب وإدلب خلال عامي 2001 و2003. تم جمع 777 عينة تربة وجذور أثناء مرحلة تكوين القرون من 259 حقلاً تقع في 90 قرية خلال كلا الموسمين. تم استخلاص النيماتودا من التربة بطريقة قمع بيرمان، كما تم استخلاص حويصلات نيماتودا الحويصلات من التربة أيضاً بطريقة التصفية والترسيب عبر المناخل. تم أيضاً صبغ جذور النباتات بطريقة الفوكسين الحامضي لتحديد أطوار النيماتودا داخلية التطفل. صنفت النيماتودا إلى مستوى الجنس باستخدام مفتاح تصنيفي متخصص، وتم حساب تكرار كل جنس على حدة، كما تم حساب نسبة الذبول الفطري في نباتات كل عينة. عزل المسبب المرضي للذبول من سوق نباتات كل عينة (2 سم فوق منطقة التاج) على بيئة PDA، ثم تمت تنقية المسبب المرضي وتعريفه وأجريت له إختبارات القدرة الإمرضية. أظهرت النتائج أن نيماتودا الحويصلات *Heterodera ciceri* كانت هي الأكثر تكراراً في تربة حقول العدس التي تم حصرها (86.9%) تلتها في ذلك نيماتودا التقرح *Pratylenchus* spp. (50.2%). وبلغت نسبة الإصابة بفطر الذبول الفيوزاريومي في النباتات المصحوبة بنيماتودا الحويصلات ونيماتودا التقرح 27.6% و 26.2% على التوالي. تم تسجيل مصاحبة سبعة أجناس نيماتودية أخرى لنباتات العدس في الحقول التي تم حصرها بصورة عامة، كما تم حساب نسبة الإصابة بالذبول الفيوزاريومي في نباتات العينات الموجبة لكل جنس نيماتودي على حدة. وتبين أن 73.0% من حقول المحافظتين كان ملوثاً بالنيماتودا فقط، و 24.7% بالنيماتودا والذبول معاً، و 0.4% بالذبول وحده، بينما بلغت نسبة الحقول الخالية من النيماتودا وفطر الذبول الفيوزاريومي 1.9% من إجمالي الحقول التي تم حصرها. أوضحت الدراسة وجود علاقة ارتباط قوية ($r = 0.89$) بين نسبة النباتات الذابلة والجنس *Paratylenchus* (النيماتودا الدبوسية) في العام 2001، وبين نسبة النباتات الذابلة وكل من نيماتودا الحويصلات *H. ciceri* ونيماتودا البراعم والأوراق *Aphelenchoides* ونيماتودا السوق *Ditylenchus* ($r = 0.72 - 0.88$) في عام 2003. كان المتوسط العام للنباتات المصابة بالذبول في الحقول التي تم حصرها خلال عامي الحصر أعلى معنوياً في محافظة إدلب (10.12%) عنه في محافظة حلب (6.62%). وأظهرت إختبارات القدرة الإمرضية أن الفطر *F.oxysporum* f.sp. *lentis* هو المسبب لمرض الذبول الفيوزاريومي في نباتات العدس.

N 11

تأثير المحصول السابق في مجتمع النيما تودا المتطفلة نباتياً المصاحب لنباتات البطاطس/البطاطا في وسط وجنوب سورية.
أنس ألتون، الشركة الوطنية لوقاية المزروعات، ص.ب 603، دوما، دمشق، سورية، البريد الإلكتروني:
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تمت دراسة تأثير المحصول السابق في مجتمعات النيما تودا المصاحبة لنباتات البطاطس/البطاطا في وسط وجنوب سورية في الفترة من 2002 إلى 2003، حيث تم إختبار تأثير زراعة القمح أو البنسون كمحاصيل سابقة لمحصول البطاطس/البطاطا في المنطقة الجنوبية، وتأثير زراعة القمح أو البطاطس/البطاطا كمحاصيل سابقة لمحصول البطاطس/البطاطا في المنطقة الوسطى. أوضحت النتائج ارتفاع كثافة الجنس *Tylenchus* في تربة نباتات البطاطس/البطاطا المزروعة بعد القمح عن كثافته. في تربة البطاطس المزروعة بعد البنسون وذلك في مراحل نمو النبات المختلفة. وزاد تكرار زراعة البطاطس في المنطقة الوسطى من كثافة الجنس *Tylenchorhynchus* وأجناس النيما تودا المتطفلة على النباتات الأخرى مقارنة بزراعة البطاطس بعد القمح.

N 12

تقدير الخسائر الناتجة عن الإصابة بنيما تودا حويصلات الحبوب *Heterodera avenae* وتكاثرها على القمح والشعير تحت الظروف الحقلية التونسية. نجوى نموشي قشوري¹، محمد المولدي بشير² والعربي الحاجي¹. (1) المعهد الوطني للبحوث الزراعية بتونس 2049 أريانة، تونس؛ (2) المعهد الوطني للعلوم الزراعية بتونس 1082 تونس، البريد الإلكتروني:
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الهدف من هذه الدراسة هو تقدير الخسائر الناتجة عن تواجد نيما تود الحبوب الكيسية *Heterodera avenae* ومدى تكاثرها على القمح الصلب (صنف كريم) والشعير (صنف ريجان) تحت الظروف الحقلية التونسية. أظهرت النتائج أنه مع زيادة مستوى اللقاح الإبتدائي هناك خفض في نمو النبات ومكونات الغلة (عدد السنابل، عدد الحبات بالسنبلة الواحدة، وزن 1000 حبة والإنتاج الإجمالي) على نحو معنوي ($P \leq 0.05$) وذلك بالنسبة للصنفين. وقد تراوح النقص في الإنتاج من 19 إلى 86% بالنسبة للقمح، ومن 26 إلى 96% بالنسبة للشعير. إضافة لذلك أظهرت هذه الدراسة وجود علاقة ارتباط إيجابية بين الكثافتين الأولية (Pi) والنهائية (Pf) بالنسبة للقمح والشعير أما العلاقة بين الكثافة الأولية (Pi) وعامل التكاثر (Rf) فقد كانت سلبية ولكن في كل الحالات يبقى عامل التكاثر أكبر من 1.

N 13

تقصي مدى انتشار نيما تودا حويصلات الشوندر السكري/البنجر *Heterodera schachtii* في سورية. منهل البلخي¹، فيصل الفرواتي¹، عبد الرحمن قطميش² وعبد الرزاق الناقوح². (1) قسم بحوث النيما تودا، إدارة بحوث وقاية النبات، مركز البحوث الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: manhal1951@yahoo.com؛ (2) مركز البحوث العلمية الزراعية في حماة، الغاب، حماة، سورية.

تم حصر انتشار وتوزيع نيما تودا حويصلات الشوندر خلال الفترة 2003-2005 في حقول الشوندر السكري في محافظات حماة، الغاب، حمص، دير الزور، الرقة وحلب، حيث تم جمع 346 عينة تربة جافة من حقول شوندر مقلوعة حديثاً، وتم استخلاص الحويصلات بقمع فينويك وقدرت الإصابة بعدد البيوض في غرام تربة بعد جرش الحويصلات، وأظهرت النتائج سلامة حقول الشوندر من الإصابة في المناطق الزراعية في حماة، دير الزور، الرقة وحلب، وتم العثور على بؤر إصابة محددة في كل من منطقتي القصير بحمص والغاب بنسبة إصابة بلغت 6.7-12.5% من إجمالي العينات وبلغ متوسط عدد البيض 2.5-3 بيضة في غرام تربة، على التوالي.

N 14

حصر أهم أجناس النيما تودا المترافقة على القطن في سورية. منهل البلخي و فيصل الفرواتي. قسم بحوث النيما تودا، إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني:
manhal1951@yahoo.com

تم جمع 220 عينة نباتية وترابية من نبات القطن خلال ثلاثة مواسم من عام 2002 وحتى 2005 في فترات زمنية ومواقع محددة بدءاً من 15 أيار/مايو وحتى نهاية الموسم، وتم استخلاص النيما تودا بالطرائق المعتمدة، وكان جنس نيما تودا نعقد الجذور *Meloidogyne* spp. المسيطر في كل من دير الزور والرقة والغاب ويعتبر هذا الجنس المسؤول عن موت وذبول النباتات مترافقاً مع الفطور (*Pythium* و *Rhizoctonia*)، وقد تراوحت الإصابة بين 5-200 وحدة نيما تودية/100 غ تربة، تلاه جنس نيما تودا التفرح *Pratylenchus* spp. في حوض الفرات وحلب والغاب، النيما تودا الحلزونية *Helicotylenchus* spp. في حلب والغاب، نيما تودا التقرم *Tylenchorhynchus* spp. في معظم المواقع والعيّنات، ووجدت النيما تودا الكلوية

N 9

تأثير اليوريا وبعض الأسمدة المركبة في درجة إصابة القمح بنيماتودا حويصلات الحبوب. أحمد سعد الحازمي وأحمد عبدالسميع محمد دوابه، قسم وقاية النبات، كلية علوم الأغذية والزراعة، جامعة الملك سعود، ص. ب. 2460، الرياض 11451، المملكة العربية السعودية، البريد الإلكتروني: dawabah@hotmail.com

درس تأثير التسميد باليوريا وبعض الأسمدة المركبة (NPK) في إصابة نباتات القمح صنف 'يوكورا روجو' بنيماتودا حويصلات الحبوب (*Heterodera avenae*) في تجربتي أصص خارج البيت المحمي. تم استخدام تربة ملوثة طبيعياً بنيماتودا حويصلات الحبوب بكثافة لقاح ابتدائية قدرها 54 بيضة/غ تربة في التجربة الأولى، و 27 بيضة/غ تربة في التجربة الثانية. استخدم التوزيع العشوائي الكامل في كل تجربة بعشر معاملات وخمسة مكررات، وشملت التجربة سبع معاملات سمادية، بالإضافة إلى ثلاث معاملات للمقارنة، هي: معاملة بمبيد الفيناميفوس، ومعاملة بدون أية إضافات (نيماتودا فقط)، ومعاملة عقرت فيها تربة الحقل الملوثة طبيعياً بالنيماتودا بالأوتوكلاف وبدون أية إضافات أيضاً. ملئت الأصص ذات القطر 16 سم بالتربة المطلوبة، وزرعت بحبوب القمح، وتمت إضافة المعاملات السمادية ومبيد الفيناميفوس بالتركيزات والمواعيد الموصى بها. تم خف البادرات بعد الإنبات مباشرة إلى ثلاث بادرات في كل إصيص، وتركت الأصص خارج البيت المحمي، ورويت حسب الحاجة، ولم تُجر أية معاملات أخرى حتى وقت انتهاء التجربة. أوضحت النتائج فاعلية مبيد الفيناميفوس في خفض أعداد الحويصلات البيضاء على جذور القمح بنسبة 95.1% في التجربة الأولى و 95.7% في التجربة الثانية، كما انخفضت أيضاً أعداد الحويصلات البيضاء على جذور القمح في معاملة اليوريا (600 كغ/هكتار دفعة واحدة عند الزراعة) بنسبة 69.5% في التجربة الأولى و 71.7% في التجربة الثانية، وفي معاملة اليوريا (600 كغ/هكتار على ثلاث دفعات) بنسبة 53.6% في التجربة الأولى و 54.3%، بينما انخفضت أعداد الحويصلات البيضاء على جذور القمح في معاملات الأسمدة المركبة (NPK) بنسب تتراوح بين 32.9% و 52.2% في التجربة الأولى، و 34.7% و 43.8% في التجربة الثانية. وفي كلتا التجربتين، كان الوزن الرطب والجاف للمجموعتين الخضري والجذري لنباتات القمح، وكذلك عدد السنابل/نبات هو الأعلى نسبياً ($P < 0.05$) في معاملة التربة المعقمة التي لم تتلق أية إضافات، والأقل نسبياً ($P < 0.05$) في معاملة النيماتودا فقط دون أية إضافات، كما أعطت المعاملة بمبيد الفيناميفوس أو اليوريا (600 كغ/هكتار دفعة واحدة عند الزراعة) زيادة معنوية ($P < 0.05$) في الوزن الرطب والجاف للمجموعتين الخضري والجذري لنباتات القمح، وعدد السنابل/نبات مقارنة بمعاملة النيماتودا فقط دون إضافات.

N 10

حصر أجناس النيماتودا المتواجدة في لمحيط الجذري لمحصول البطاطس/البطاطا في وسط وجنوب سورية. أنس التون، الشركة الوطنية لوقاية المزروعات، ص. ب. 603، دوما، دمشق، سورية، البريد الإلكتروني: anas-altoun@mail.sy

تم تقصي الأجناس النيماتودية المتواجدة في المحيط الجذري لمحصول البطاطس/البطاطا بوسط وجنوب سورية بين عامي 2002 و 2003. شمل الحصر 86 حقلاً موزعة في 40 موقعا بمناطق إنتاج البطاطس/البطاطا الرئيسية، وأسفرت النتائج عن وجود 38 جنساً نيماتوديا، كان منها 19 جنساً متطفلاً على النباتات، و 8 أجناس متغذية على البكتيريا، و جنسين متغذيين على الفطريات، و 8 أجناس متعددة التغذية، و جنساً واحداً مفترساً. شكلت الأجناس المتطفلة على النباتات نسبة 19.9% من المجموع العام للنيماتودا في حقول البطاطس/البطاطا بالمنطقة الجنوبية، و 36.3% بالمنطقة الوسطى. بلغت نسبة جنس نيماتودا تعقد الجذور *Meloidogyne* spp. 9.06% من مجموعة النيماتودا المتطفلة على النبات في إجمالي حقول الدراسة، تلاه الجنس *Tylenchus* (6.37%) ثم جنس النيماتودا الدبوسية *Paratylenchus* (4.85%)، و جنس نيماتودا التقزم *Tylenchorhynchus* (4.81%). سجل الجنسان *Myelonchulus* و *Garcilacus* لأول مرة في سورية وبنسبة ضئيلة جداً (0.007% و 0.005%، على التوالي). تم حساب مقاييس الكثافة النسبية (Relative population density)، والتكرار المطلق والنسبي (Absolute and Relative frequency)، وقيمة التميز (Prominence value) والخطأ القياسي للعينة (Standard error of sampling) لكل من الأجناس المسجلة، و كان الجنس *Tylenchus* هو الأكثر تكراراً في مجموعة النيماتودا المتطفلة على النبات 86%، تلاه الجنس *Tylenchorhynchus* (70%)، والجنس *Pratylenchus* (63%)، فالجنس *Ditylenchus* (17%)، فالجنس *Meloidogyne* (6%)، وبلغ معامل التماثل (Index of similarity) بين المنطقة الجنوبية والوسطى 1.17.

N 6

التأثير المقارن لكسبة اللفت الزيتي وبعض المعاملات الأخرى في مكافحة بعض أجناس النيماطودا المرافقة لجذور الذرة. صبحية العربي وميمونة المصري، قسم وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: sobhia_alarabi@hotmail.com

تم إجراء تجربتين، الأولى في محطة 1 أيار (محافظة ريف دمشق) والثانية في محطة المريعية (دير الزور)، وذلك لمقارنة كفاءة كسبة اللفت الزيتي (2.5، 5، 7.5 و 10 غ/كغ تربة) وسماد روث البقر العضوي (4 طن/هـ)، والسماد الكيماوي المركب NPK (6 كغ/دونم) ومبيد إيثوبروب (10 حبيبة) (25.2 غ مادة فعالة/م²) في مكافحة بعض أجناس النيماطودا (*Macroposthonia*, *Hoplotaimus*, *Helicotylenchus*, *Hemicyliophora*, *Longidorus*, *Heterodera*, *Ditylenchus*) (*Xiphinema*, *Tylenchus*, *Tylenchorhynchus*, *Rotylenchus*, *Pratylenchoides*, *Pratylenchus*, *Paratylenchus*) المرافقة لجذور الذرة (*Zea mays* L.). في كلا التجربتين، خفضت ($P \leq 0.05$) كسبة اللفت الزيتي (7.5 غ/كغ تربة) الكثافة العددية للنيماطودا بنسبة 72.7% في التربة و 79.8% في الجذور، متفوقة بذلك على مبيد إيثوبروب، كما أسهمت جميع المعاملات في زيادة ($P \leq 0.05$) النمو الخضري لنبات الذرة ووزن المحصول مقارنة بالشاهد، وكانت معاملة كسبة اللفت الزيتي (7.5 غ/كغ تربة) هي الأكثر تفوقاً في ذلك، حيث أدت إلى زيادة في المحصول قدرها 84.69%.

N 7

التوزيع الجغرافي لنيماطودا حوصلات الحبوب *Heterodera avenae* و *H. latipons* بالجزائر وقابلية بعض أصناف الحبوب للإصابة. عيسى مقابلي، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر، البريد الإلكتروني: mokaissa@yahoo.fr

بينت دراسة المسح التي أجريت منذ عام 1992 وجود نوعين من نيماطودا حوصلات الحبوب في مناطق زراعة الحبوب بالجزائر هما النوعان *Heterodera avenae* و *H. latipons*. وقد اختلفت درجة الإصابة من منطقة إلى أخرى، وكانت أكثر المناطق تلوثاً بالنيماطودا هي تلك المناطق التي تعتمد نظام الدورات الزراعية التي تركز على الحبوب (القمح انصليب، القمح اللين، الشعير، الشوفان) كمناطق تيارت، وعين الدفلة، سطيف، ومعسكر، وسيدي بلعباس، وشلف. أوضحت الدراسة قابلية جميع أصناف الحبوب المختبرة -بدرجات متباينة- للإصابة بكلا النوعين من النيماطودا، وقد كان صنف القمح Bidi 17 هو أكثر الأصناف المختبرة قابلية للإصابة، ويمكن استخدامه كعائل لإكثار هذين النوعين من النيماطودا بالجزائر.

N 8

العلاقة بين مستوى اللقاح الابتدائي لنيماطودا تعقد الجذور *Meloidogyne incognita* وشدة الإصابة وتكاثر النيماطودا على الفاصولياء. صالح نعمان النظاري، أحمد سعد الحازمي، أحمد عبد السميع محمد دوابه وفهد عبد الله البيحي، كلية علوم الأغذية والزراعة، جامعة الملك سعود، ص.ب. 2460، الرياض 11451، المملكة العربية السعودية، البريد الإلكتروني: nadary3@yahoo.com

تمت هذه التجربة في البيت المحمي لتحديد العلاقة بين مستوى اللقاح الابتدائي (Pi) لنيماطودا تعقد الجذور *Meloidogyne incognita* (race 2) وكل من قدرتها الإمراضية ومعدل تكاثرها على نباتات الفاصولياء الخضراء (*Phaseolus vulgaris*) صنف Contender. استخدمت ثمانية مستويات من لقاح النيماطودا: 0 (الشاهد)، 1، 2، 4، 8، 16، 32 و 64 بيضة/غ تربة. أوضحت النتائج انخفاضاً في الوزن الرطب الخضري والجذري للنبات، خاصة عند المستويات المتوسطة والعالية. ازداد هذا الانخفاض كلما ازداد مستوى اللقاح حتى وصل إلى موت النباتات، في منتصف التجربة، عند مستوى لقاح 64 بيضة/غ تربة. كما ظهر على الجذور تعقد شديد حتى عند المستوى الأدنى من اللقاح، وازداد هذا التعقد مع زيادة مستوى اللقاح حتى وصلت الزيادة إلى 679% عند مستوى لقاح 32 بيضة/غ تربة. وأوضحت نتائج تحليل الانحدار إلى وجود علاقة سالبة بين مستوى اللقاح وكل من النمو الخضري ($R^2 = 0.54$) والجذري ($R^2 = 0.28$)، وعلاقة خطية موجبة بين مستوى اللقاح وعدد العقد على الجذور ($R^2 = 0.75$). تكاثرت النيماطودا، وبدرجة عالية على هذا الصنف، حيث ازدادت أعداد كتل البيض والبيض على الجذور كلما ازداد مستوى اللقاح. بلغ عامل التكاثر (Rf) أعلى قيمة له عند المستوى الأدنى من اللقاح، ثم بدأ في الانخفاض تدريجياً حتى وصل إلى أقل من واحد عند مستوى لقاح 32 بيضة/غ تربة. كانت هناك علاقة موجبة بين مستوى اللقاح وعدد كتل البيض ($R^2 = 0.86$)، وعلاقة خطية سالبة بين مستوى اللقاح وعامل التكاثر ($R^2 = -0.71$). أوضحت هذه التجربة أن هذا الصنف قابل للإصابة بهذه النيماطودا، وذو حساسية شديدة للإصابة خاصة عند المستويات العليا من اللقاح، كما اتضح أن هذا الصنف عائل جيد وداعم لتكاثر النيماطودا.

زيادة متوسط الكثافة العددية مع بداية النمو الخضري والجذري لنبات العائل وصولاً للذروة في شهر أيلول/سبتمبر، لكن مع دخول النبات في طور نموه الأخير انخفض متوسط الكثافة العددية عند الحصاد. وتفوق مطحون بقايا نباتات اللفت الزيتي في محطة 1 أيار من حيث القدرة على خفض متوسط الكثافة العددية للنيماطودا المتطفلة في شهري آب/أغسطس وتشرين الأول/أكتوبر بعكس بقية المعاملات. بالمقابل كانت كسبة تفل الزيتون أفضل معاملة في محطة المريعية خلال موسم نمو الذرة.

N 4

تواجد نيماطودا القمّة البيضاء *Aphelenchoides besseyi* في بعض زراعات الأرز في جنوب محافظة الدقهلية في مصر وإدارتها تحت ظروف الحقل. أحمد جمال الشريف¹، أشرف السعيد محمد خليل²، عبد الفتاح رجب رفاعي¹ وأحمد حماد نور الدين¹. (1) وحدة بحوث النيماطولوجي، قسم الحيوان الزراعي، كلية الزراعة، جامعة المنصورة، مصر؛ (2) معهد بحوث أمراض النبات، مركز البحوث الزراعية، الجيزة، مصر، البريد الإلكتروني: elsherifmohammed@yahoo.com
فحصت أعراض الإصابة بنيماطودا القمّة البيضاء في الأرز *Aphelenchoides besseyi* في مرحلة النمو الخضري والزهرى والسنابل وقت الحصاد (غضة) وكذلك عينات حبوب مخزونة (12 شهراً) لدى المزارع لكل من أصناف الأرز سخا 101، 103 وريهو بحقول الأرز بجنوب محافظة الدقهلية. سجل إبيضا قمة أوراق النباتات المصابة في مرحلة النمو الخضري وقصرها والتفافها مع وجود شرائط ملونة بطول حافة واحدة لورقة النبات في مرحلة الإزهار والحصاد في كل أصناف الأرز المدروسة. كما دلت النتائج أن نسبة 18.27% من الحبوب المخزونة و66.6% من الحبوب الحديثة وقت الحصاد مصابة بنيماطودا *A. besseyi* بدرجة ملحوظة. وكان الصنف سخا 103 أكثر الأصناف قابلية للإصابة بمعدل 22.22% و7.5% محتويًا على 115 و30 فرداً لكل 100 حبة في الحبوب المخزونة والحديثة، على التوالي. كما كانت سنابل الصنف سخا 101 للنباتات المصابة بمرض القمّة البيضاء قصيرة (16.08%) وخفيفة الوزن (38.63%) وقليلة فسي وزن الألف حبة (53.71%) مع وجود حبوب عقيمة بنسبة 41.53% إذا ما قورنت بالسنابل التي لم تظهر أعراض المرض. وكان معدل أعداد النيماطودا في 100 حبة عالي في السنابل ذات الأعراض المرضية مقارنة مع تلك بدون أعراض بمعدل 160 و 15 فرد، على التوالي. كما كان طول ورقة العلم 5.3 سم في النباتات المصابة. أوضحت نتائج مكافحة نيماطودا القمّة البيضاء في الأرز *A. besseyi* على صنف سخا 103 خلال موسم النمو 2003 تحت ظروف الحقل باستخدام أربعة مبيدات كيميائية هي الملاثيون 57% والدايمثويت 40% (كلاهما رشاً) والكاربو النصر 10% والكارتان 10% (كلاهما نثراً)، وكذلك مستخلص نباتيين (كلاهما رشاً) الداتورا والونكا. وأظهرت النتائج أن كل هذه المواد خفضت تعداد النيماطودا بدرجة ملحوظة على الأوراق، وكذلك الحبوب حيث أعطى مستخلص نبات الونكا *Vinca rosea* أعلى نسبة خفض في تعداد النيماطودا بالأوراق (55.71%) يليه مبيد الدايمثويت (25.88%). وكان مستخلص نبات الداتورا الأقل في قيمة خفض تعداد النيماطودا (1.62%) مقارنة بالنباتات غير المعاملة. كما أعطى مستخلص نبات الونكا أعلى معدل خفض في تعداد النيماطودا في الحبوب (83.3%) وبالتالي زيادة في محصول حبوب الأرز بمعدل 61.4% يليه في ذلك مبيد الدايمثويت (54.6%).

N 5

إختبار فاعلية بعض المبيدات النيماطودية في مكافحة نيماطودا تعقد الجذور (*Meloidogyne javanica*) على الطماطم/البندورة. عثمان سالم الدخلي¹، نبيل أعيش فرحات¹ ويوسف على الناجح². (1) المركز العالي للتقنيات الزراعية، شعبية جفارة، الغيران، ص.ب. 151، طرابلس، ليبيا، البريد الإلكتروني: amn_de@yahoo.com؛ (2) مركز البحوث الزراعية، طرابلس، ليبيا.

تمت دراسة تأثير فاعلية مبيدين من المبيدات النيماطودية وهما فيوردان (مبيد جهازي) وموكاب (مبيد بالمامسة) بالجرعة الموصى بها من قبل الشركة المنتجة، وأيضاً جرعة عالية وذلك لمكافحة نيماطودا تعقد الجذور (*Meloidogyne javanica*) على الطماطم/البندورة صنف ريو جراند تحت ظروف الدفيئة الزراعية. نتج عند استخدام تركيزي مبيد الفيوردان في معاملة التربة الملوثة ببيوض النيماطودا إلى تحسن ملحوظ في نمو النبات وخفض تعداد وتكاثر النيماطودا في التربة، وكذلك أعداد التاليل وأكياس البيض على الجذور بدرجة معنوية مع كلا التركيزين المختبرين، مما أدى إلى خفض معنوي في معامل تعقد الجذور. ومن ناحية أخرى وجد أن زيادة تركيز الفيوردان لم تؤثر معنوياً في معدل نمو النباتات غير المعاملة بالنيماطودا مقارنة بمعاملة الشاهد. بينما لم يكن هناك أثر للإصابة على الجذور عند استخدام مبيد الموكاب حيث كان فاعلاً عند استعماله بالجرعة العالية فقط في معاملة التربة الملوثة ببيوض النيماطودا، إلا أنه أثر سلبياً على معدل نمو النبات إذ حدث نقص في معدل نمو النباتات. وقد يرجع ذلك للتأثير السام للمبيد عند زيادة الجرعة في حين أن استعماله بالتركيز الموصى به لم يمنع حدوث الإصابة أو تكون العقد الجذرية على جذور نباتات التربة المعاملة الملوثة ببيوض النيماطودا مقارنة بالشاهد.

N 1

كفاءة مسحوق أوراق القرنبيط ضد نيماتودا تعقد الجذور *Meloidogyne javanica* في الحقل المكشوف والبيوت الزجاجية. زهير عزيز اسطيفان، عمر خليل رمان، هديل بدري داود وكوثر هاشم توفيق، قسم بحوث وقاية النبات، الهيئة العامة للبحوث الزراعية، أبو غريب، بغداد، العراق، البريد الإلكتروني: zuhairstephan@yahoo.com
أدى إضافة مسحوق أوراق القرنبيط بنسبة 1 و 2 غ/كغ تربة قبل أسبوع من الزراعة لبادرات الباذنجان إلى توفير حماية شبه كاملة بلغت 97.2 و 99.8%، على التوالي ضد الإصابة بنيماتودا تعقد الجذور *Meloidogyne javanica* بعد 60 يوماً من الإعداء. كما تحسن النمو الخضري والجذري الجاف معنوياً مقارنة مع النباتات المعدة تربتها بالنيماتودا. أما المستخلص الكحولي لمسحوق أوراق القرنبيط الذي استعمل بالتركيز 125، 250، 500 و 1000 جزء بالمليون فقد ترواحت كفاءته في مكافحة هذه الآفة ما بين 15.18-63.70% في دراسة نفذت في أصص بلاستيكية تحت ظروف المظلة الخشبية. أظهرت نتائج تجارب الحقل المكشوف في أبو غريب والبيوت الزجاجية في الراشدية الميوية تربتها بنيماتودا تعقد الجذور خلال موسم 2005 أهمية هذا المرض الذي يهاجم نباتات الخيار، إذ بلغت النسب المئوية للنباتات المصابة والميتة 94.26 و 94.12% مما أدى إلى انخفاض معنوي في الإنتاجية. كذلك أكدت النتائج الفاعلية العالية لمسحوق أوراق القرنبيط بنسبة 4 غ/م²، الفورفورال بنسبة 4 سم³/م²، والمبيد الأحيائي ترايكوديرما *Trichoderma harzianum* (بايكونت) بنسبة 1 غ/م² عند إضافتها للتربة قبل أسبوع من الزراعة في السيطرة على النيماتودا، مما أدى إلى زيادة معنوية في إنتاجية الخيار. وبالرغم من أن الإنتاجية من جراء المعاملة بالمبيدين الكيميائيين فير تيميك وكاربوفوران كان أفضل معنوياً مقارنة مع معاملة النباتات الملوثة تربتها بالنيماتودا (الشاهد) ولكنهما كانا أقل كفاءة في السيطرة على هذه الآفة وبفروق معنوية مقارنة مع مسحوق القرنبيط والفورفورال والمبيد الأحيائي.

N 2

استجابة نبات الباذنجان لكثافات عديدة مختلفة من نيماتودا تعقد الجذور *Meloidogyne incognita* والتغيرات التشريحية في خلايا النباتات المصابة. محمود محمد أحمد يوسف وأحمد محمد كريم، قسم أمراض النبات، مختبر النيماتودا، المركز القومي للبحوث، الدقي، الجيزة، مصر، البريد الإلكتروني: myoussef_2003@yahoo.com
درست العلاقة بين بعض الكثافات العددية المختلفة من نيماتودا تعقد الجذور *Meloidogyne incognita* وإنتاجية نباتات الباذنجان صنف بلدي تحت الظروف الحقلية. وجدت علاقة ارتباط سالبة ($r = -0.72$) بين عدد العقد النيماتودية للنبات المصاب وإنتاجيته من الثمار، كما بلغ معامل التقدير ($r^2 = 0.52$). كما وجد أيضاً علاقة انحدار سالبة بين عدد العقد النيماتودية لكل نبات مصاب وإنتاجيته من ثمار الباذنجان ($Y = 721.9 - 36.1 X$). وبالنسبة للتغيرات التشريحية في جذور نباتات الباذنجان فقد وجد أن يرقات النيماتودا أختزقت الجذور في منطقة البشرة والقشرة حتى وصلت إلى الاسطوانة الوعائية، وقد نتج عن الإصابة بهذه النيماتودا تكسير الخلايا وظهور الخلايا العملاقة والخلايا متعددة الانقسام. كما وجدت كتل بيض على السطح الخارجي للجذور والطور اليرقي الثاني والثالث والرابع والأنث الكاملة في أنسجة النباتات المصابة.

N 3

تأثير بعض الإضافات العضوية في دينامية نيماتودا جذور الذرة. ميمونة المصري¹، صبحية العربي¹، خالد العسس²، مجد جمال¹. (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، protlib@mail.sy؛ (2) جامعة دمشق، كلية الزراعة، قسم وقاية النبات، دمشق، سورية.

يهدف دراسة دينامية المجتمع النيماتودي تحت تأثير المحسنات العضوية خلال موسم النمو 2003 تم تقسيم الأرض في كل من المحطتين (1 أيار والمريعية) إلى 64 قطعة تجريبية، ووزعت المعاملات على المكررات بصورة عشوائية بمعدل أربع مكررات لكل معاملة وفق تصميم قطاعات عشوائية كاملة. أضيفت المحسنات العضوية (كسبة تفل الزيتون ومطحون بقايا نباتات الذرة ومطحون بقايا نباتات اللفت الزيتي عند تراكيز 2.5 و 5 و 7.5 و 10 غ/كغ تربة) والسماذ العضوي (4طن/هـ) قبل الزراعة بـ 21 يوماً والسماذ الكيماوي (6 كغ/دونم) ومبيد الموكاب (52.2 غ/م²) عند الزراعة. بينت نتائج التحليل الإحصائي للعينات الترابية المأخوذة شهرياً خلال موسم النمو إنخفاض متوسط الكثافة العددية للنيماتودا المتطفلة في جميع القطع التجريبية المحسنة بالمواد العضوية مقارنة بالشاهد. ولوحظ الإنخفاض في متوسط الكثافة العددية الأولية بعد أربعين يوماً من الزراعة في محطة إيار بعدها ازداد متوسط الكثافة تدريجياً ليبلغ الذروة العددية عند الحصاد. واختلف سلوك النيماتودا غير المتطفلة التي تزايد متوسط كثافتها العددية في القطع المحسنة بالمواد العضوية مقارنة بالشاهد الذي حافظ على متوسط كثافة منخفض طوال الموسم وارتفع عند الحصاد. بالمقابل أظهرت التغيرات الشهرية لدينامية المجتمعات النيماتودية المتطفلة في محطة المريعية إنخفاضاً حاداً في متوسط الكثافة العددية الأولية بعد ثلاثة أسابيع من إضافة المواد العضوية للتربة، لتعود إلى الارتفاع بصورة تدريجية للوصول للذروة عند الحصاد. وتتشابه نتائج دراسة دينامية النيماتودا غير المتطفلة مع سابقتها في

نيماتودا

والمختلطة، وتأثير الإصابة الفيروسية في بعض الخصائص المورفولوجية للنبات (طول النبات، عدد الأوراق، وزن المجموع الجذري، مساحة سطح الورقة). أظهرت النتائج تباينا واضحا في حساسية الأصناف المختلفة للإصابة بكل من الفيروسين وبالإصابة المختلطة، حيث كانت إصابة الصنف "برلي" بفيروس موزايك الخيار متوسطة وأكثر، أما فيروس البطاطا واي فقد كانت إصابته ضعيفة وكان أكثر الأصناف حساسية هو الصنف "برلي". أما الإصابة المختلطة فكانت الإصابة أشد والتفاوت أكبر على الأصناف، كما كان التأثير واضحا في الخصائص المورفولوجية .

V 57

تأثير بعض برامج مكافحة الكيمائية والزراعية في نسبة وشدة الإصابة بمرض تورق أزهار السمسم الفايوتوبلازمي على محصول السمسم تحت ظروف الإصابة الطبيعية. ايداد عبد الواحد الهيتي وعدي نجم الحديثي، قسم وقاية النبات، كلية الزراعة، جامعة بغداد، أبوغريب، بغداد، العراق، البريد الإلكتروني: Udayal_hadethy@yahoo.com

أظهر المبيد الحمازي أكتارا (Thiamethoxam) من مجموعة Neonicotinoid تأثيرا جيدا في خفض نسب الإصابة بالفايوتوبلازما تورق أزهار نباتات السمسم بعد المعاملة رشاً في ستة مواعيد (7/4، 7/18، 8/1، 8/14، 8/27 و 9/10) خلال موسم 2001. رشت النباتات بأعمار مختلفة بمعدل رشة واحدة في الموعد المحدد لكل معاملة، مقارنة مع الشاهد (بدون معاملة). تراوحت نسبة الإصابة ما بين 0.92-1.49% في المعاملات المرشوشة بتركيز 0.1 غ/لتر، مقارنة بمعاملة الشاهد (5.68%). كما وجد أن الرش المتكرر والمتعاقب بعدد من المبيدات الحشرية [مبي ديازينوكس Ec 60% (Diazinon) بتركيز 4 مل/لتر، مبيد ففالفيريت Ec 20% (Pyrithrum) بتركيز 0.4 مل/لتر، ومبيد اكتارا WG Actara 25 (Thiamethoxam) بتركيز 0.1 غ/لتر]، قد أثر في خفض معنوي لنسبة الإصابة بمرض تورق أزهار السمسم الفايوتوبلازمي مقارنة بالشاهد (0.46 و 10.48%)، على التوالي. وأظهر مبيد الكروزر FS 350 (Thiamethoxam) مبيد جهازية يعود لمجموعة Neonicotinoid بتركيز 0.1 مل/100 غ بذور خلطا مع بذور السمسم أثر معنوي في خفض نسبة الإصابة بمرض تورق أزهار السمسم مقارنة بمعاملة الشاهد، إذ بلغت نسبة الإصابة بمرض تورق أزهار السمسم 1% و 5.89% لكل منهما، على التوالي. لم يظهر موعد زراعة المحصول أثرا في نسبة وشدة الإصابة بالمرض على العكس من ذلك وجد أثرا معنويا لنوع الحماز النباتي، إذ تفوق محصولا الذرة الصفراء والذرة البيضاء في خفض نسب الإصابة معنويا مقارنة بالشاهد إذ بلغت نسبة الإصابة فيها 0.46 و 1.95%، على التوالي مقارنة مع الشاهد (5.86%).

V 58

تأثير مواعيد الزراعة في الإصابة بمرض تورق الأزهار (Sesame phyllody) والإنتاجية لمحصول السمسم (*Sesamum indicum* L.) في وادي حضرموت، اليمن. سالم محمد السقاف، محطة البحوث الزراعية، سيئون، حضرموت، ص.ب 9041، اليمن، البريد الإلكتروني: agr.res.seiyun@y.net.ye

أجريت خلال موسمين متتاليين دراسة تأثير ستة مواعيد زراعة (15 شباط/فبراير، 15 مارس/مارس، 15 نيسان/أبريل، 15 مايو/مايو، 15 حزيران/يونيو و 15 تموز/يوليو) على محصول السمسم (*Sesamum indicum* L.) في الإصابة بمرض تورق الأزهار (Sesame phyllody) المتسبب عن كائنات شبيهة بالميكوبلازما وعلى الإنتاجية للصنف المحلي الأحمر، وذلك في الحقل التجريبي بمحطة البحوث الزراعية بوادي حضرموت. أوضحت النتائج أن أفضل المواعيد هي شباط/فبراير و آذار/مارس، فكان معدل الإصابة بمرض تورق الأزهار متدنيا (19.9% و 15.2%، على التوالي) وبفروقات معنوية مقارنة بالمواعيد الأخرى (نيسان/أبريل، أيار/مايو، حزيران/يونيو وتموز/يوليو)، وبلغ معدل الإصابة بالمرض 57.7%، 86.8%، 57.9% و 24.5%، على التوالي. كذلك تم الحصول على أعلى إنتاجية من المحصول في شهري شباط/فبراير و آذار/مارس، حيث كان معدل الإنتاجية 1.7 و 1.8 طن/هـ، على التوالي، في حين تراوح معدل الإنتاجية للمواعيد الأخرى ما بين 0.31 و 0.93 طن/هـ.

V 53

حصر الفيروسات المرتبطة بأعراض الموزايك على الورد بالأردن. عقل منصور، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: akelman@ju.edu.jo
توضح الدراسة بأن فيروس البقع الحلقية الميتة للدراق (*Prunus necrotic ring spot virus*) وفيروس موزايك التفاح (*Apple mosaic virus*) هما الفيروسان المرتبطان بأعراض الموزايك على الورد، إما كإصابة منفردة أو مختلطة. وقد كان فيروس البقع الحلقية الميتة للدراق هو الفيروس الشائع واحتل المرتبة الأولى سواء على ورد الحدائق أو المشاتل أو المزروع تحت البيوت البلاستيكية لإنتاج أزهار القطف. كما دلت الدراسة على أن أفضل وقت للكشف عن فيروسات موزايك الورد هو فصل الربيع حيث أعراض الموزايك تكون واضحة على النباتات المصابة. ونظراً لارتفاع نسبة الإصابة بفيروسات موزايك الورد في كل المناطق التي تم مسحها وتواجدها في الورد الموجود في المشاتل، فإن هذا يدل على أن زراعة الورد وتوزيعها داخل الأردن يتم بدون أي رقابة على الأشكال أو العقل. ويعتبر هذا التقرير الأول من نوعه في الأردن حول تحديد فيروسات موزايك الورد.

V 54

التحري عن فيروس موزايك الخيار على نبات التبغ البري *Nicotiana glauca* Graham بمناطق مختلفة غرب ليبيا. محجوب علي اجمال¹، عمر موسى السنوسي² وصلاح سعيد العماري³. (1) كلية الزراعة، جامعة التحدي، سرت، ليبيا؛ (2) كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا؛ (3) كلية الزراعة، جامعة قاريونس، ليبيا، البريد الإلكتروني: Omarelsanousi@yahoo.co.uk

باستخدام اختبار الإحتواء المزدوج - إليزا (DAS-ELISA)، تم تعريف فيروس موزايك الخيار (*Cucumber mosaic virus*) كمسبب أساسي لأعراض الموزايك على التبغ البري *Nicotiana glauca* في 25 عينة مجموعة من خمس مناطق من ليبيا (سرت، مصراته، الخمس، طرابلس، والزوايه). كما كشف عن وجود فيروس موزايك الخيار منفرداً في بعض العينات، ومع فيروس آخر من جنس *Tobamovirus* في معظمها. كما أمكن نقل فيروس موزايك الخيار بالإعداء الميكانيكي بالعصارة النباتية إلى 19 نوعاً وصنفاً نباتياً من ضمن 32 نباتاً شملتها الدراسة، وهذه الأصناف هي: *Chenopodium quinoa* Willd.، *Gomphrena globosa* L.، *Chenopodium amaranticolor* Coste & Regn.، *Nicotiana benthamiana*، *Capsicum annuum* L. cv. Cayenna، *Vicia faba* L.، *Citrullus vulgaris* cv. Klondike، *Domin*، *Nicotiana glauca* R.C.Graham، *Nicotiana glutinosa* L.، *Nicotiana tabacum* L. (الأصناف 21 Burley)، *Physalis floridana*، *Petunia hybrida* Vilm.، (Xanthi-nc و Xanthi، White Burley، Turkish، Burley gold)، *Solanum melongena* L. cv. Black Beauty و *Solanum nigrum* L.

V 55

عزل ودراسة عدة عزلات من توباموفيرس (*Tobamovirus*) على نبات التبغ البري *Nicotiana glauca* Graham في ليبيا. محجوب علي اجمال¹، عمر موسى السنوسي² وصلاح سعيد العماري³. (1) كلية الزراعة، جامعة التحدي، سرت، ليبيا؛ (2) كلية الزراعة، جامعة عمر المختار، البيضاء؛ (3) كلية الزراعة، جامعة قاريونس، ليبيا، البريد الإلكتروني: Omarelsanousi@yahoo.co.uk

من الشائع إصابة الدخان البري *Nicotiana glauca* بأعراض الموزايك في الشريط الساحلي من ليبيا. وللتعرف على الفيروس المسبب لهذا المرض تم اختبار 25 عينة مجموعة عشوائياً من خمس مناطق مختلفة بالجزء الغربي للشريط الساحلي. وباستخدام اختبار ELISA وجد أن عزلة واحدة في الدراسة لفيروس *Tobacco mild green mosaic virus* (TMGMV) يتبع *Tobamovirus* بصورة منفردة بينما في العديد من العينات وجد هذا الفيروس مصاحباً لفيروس *Cucumber mosaic virus* (CMV). دراسة المدى العوائلي والأعراض دعمت تعريف فيروس TMGMV باستخدام ELISA.

V 56

تأثير الإصابة بفيروس الباطا/البطاطس واي وموزايك الخيار والعدوى المختلطة في بعض أصناف التبغ في ظروف المختبر. ماهر مصري، فداء شمسين، توفيق ناصر وعماد إسماعيل، المؤسسة العامة للتبغ، دائرة الأبحاث في جب حسن، ص.ب. 3100، اللاذقية، سورية، البريد الإلكتروني: kaisgazal@shufbc.com

نفذت تجربة مخبرية خلال الموسم الزراعي 2005/2004 في موقع دائرة الأبحاث في جب حسن باللاذقية التابعة للمؤسسة العامة للتبغ لدراسة تأثير كل من فيروس الباطا/البطاطس واي وموزايك الخيار والعدوى المختلطة في بعض أصناف التبغ (تنباك، برلي، فرجينيا). تم دراسة خلالها مقارنة حساسية الأصناف المدروسة للإصابة الفيروسية المفردة

V 51

تعريف فيروس التفزم الأصفر في البصل كواحد من الفيروسات الرئيسية التي تصيب الثوم في مصر. صبري يونس محمد محمود¹ وممدوح حسين عبد الغفار². (1) قسم النبات الزراعي (ميكروبيولوجيا زراعية)، كلية الزراعة، سوهاج، 82786، جامعة جنوب الوادي، مصر، البريد الإلكتروني: sabryaraby2003@yahoo.com؛ (2) مختبر الفيروسات، قسم الميكروبيولوجيا الزراعية، كلية الزراعة، جامعة عين شمس، ص.ب 68، حدائق شبرا 112421، القاهرة، مصر.

يسبب فيروس التفزم الأصفر في البصل أعراض الموزايك على الثوم وذلك إلى جانب فيروسات أخرى. تم فصل فيروس التفزم الأصفر الذي يعطي عرض التخطيط الأصفر على الثوم من الفيروسات الأخرى المختلطة معه على نباتات الثوم المصابة طبيعياً. أمكن نقل الفيروس ميكانيكياً بسهولة بالعصير إلى نباتات الثوم والزريريج، ووجد أن الفيروس يتميز بمدى عوائل ضيق ينحصر في الأبصال. ينتقل الفيروس أيضاً بحشرة من الخوخ الأخضر (*Myzus persicae*) بالطريقة غير المثابرة. وبفحص القطاعات فائقة الدقة بالميكروسكوب الإلكتروني لأنسجة نبات الثوم (صنف بلدي) المصابة وجود أجسام محتواة هي عبارة عن pinwheels, laminated aggregates في سيتوبلازما الخلايا المصابة. تم تنقية الفيروس باستخدام طريقة معدلة أشتملت الترويق باستخدام Triton x-100 والطررد المركزي البطيء، ثم ترسيب جزيئات الفيروس بالبولي ايثيلين جليكول، ومن ثم تركيز الفيروس باستخدام ثلاث دورات من الطرد المركزي الفائق السرعات، الأولى في طبقة من السكروز 20% والثانية باستخدام عمود من كلوريد السيزيم متدرج الكثافة (صفر -40%) والثالثة باستخدام عمود سكروز متدرج الكثافة (10-40%). وقد أثبت منحنى امتصاص الأشعة فوق بنفسجية أن التحضيرات المنقاة بها جزيئات فيروسية بتركيز تراوح من 15 إلى 20 مغ فيروس/1 كغ نسيج نباتي مصاب. وجدت جزيئات خيطية بلغت أبعادها 750-775 × 15 نانومتراً بعد صبغ التحضيرات المنقاة بالصبغ السالب وفحصها بالميكروسكوب الإلكتروني النافذ. وتتركب جزيئات الفيروس من غطاء بروتيني واحد وزنه الجزيئي حوالي 35 كيلو دالتون. وقد تم الكشف عن وجود الحمض النووي الفيروسي في كل من التحضيرات النباتية المصابة والجزيئات الفيروسية المنقاة باستخدام اختبار RT-PCR عن طريق مضاعفة جين الغلاف البروتيني الكامل والذي قدر حجمة الطولي بحوالي 288 زوج من القواعد باستخدام نوعين من البادئات المصممة والمتخصصة لهذا الفيروس. وقد أنتجت أجسام مضادة متعددة الكلون متخصصة لهذا الفيروس، وقد عيار المصل باستخدام اختبار اليزا غير المباشر.

V 52

دراسة أولية عن فيروسات الفليفلة في سورية وإمكانية إنتقال بعضها بواسطة البذور. خديجة دعاس¹، هدى قواص² وصلاح الشعبي¹، (1) الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، (2) كلية الزراعة، جامعة دمشق، دمشق، سورية، البريد الإلكتروني: gcsarshaabi@mail.sy

جري مسح حقلي خلال عامي 2004 و 2005 لتحديد أهم الفيروسات التي تصيب الفليفلة (*Capsicum annum L.*) في المناطق التقليدية لزراعتها في سورية في محافظات ريف دمشق، درعا، حمص، طرطوس واللاذقية. وتراوح حدوث الإصابات الفيروسية ما بين 20 و 95% بناء على نتائج تقصي الأعراض الظاهرية في 60 حقلاً تم مسحها في كلا الموسمين. وسجلت أشد الإصابات في محافظة درعا (48.94%) في عام 2004. أظهرت النتائج لتقصي فيروسات موزايك الفصاة (AMV)، وموزايك الخيار (CMV) وتبقع وذبول البندورة/الطماطم (TSWV) وفيروس البطاطا واي (BVY)، وفيروس موزايك التبغ (TMV) في 245 عينة ورقية تم جمعها بصورة عشوائية من الحقول والمحافظة السابقة، بواسطة اختبار الاحتواء المزدوج للفيروس بالأجسام المضادة (DAS ELISA)، إصابتها بفيروس واحد على الأقل بنسبة 37.5% تحت ظروف العدوى الطبيعية. وكان فيروس موزايك الخيار أكثرها انتشاراً (7.34%)، تلاه فيروس موزايك الفصاة (4.9%)، فيروس تبقع وذبول البندورة/الطماطم، فيروس البطاطا واي (3.61%)، ثم فيروس موزايك التبغ (2.44%). ووجد أن 9.39 و 5.3% من العينات المختبرة مصابة بفيروسين أو ثلاثة، على التوالي. لم تحدد المسببات الفيروسية لبعض مظاهر الإصابة التي لوحظت على النباتات في الحقل نتيجة لعدم استخدام الأمصال المناسبة المتخصصة بالكشف عن الفيروسات الأخرى. أظهرت نتائج إختبارات البادرات النامية من بذور (308 بذرة) جمعت من ثمار ونباتات فليفلة أبدت مظاهر الإصابة الفيروسية بواسطة الإختبار المناعي لبصمة النسيج النباتي (TBIA) إمكانية الإنتقال البذري لفيروس موزايك الخيار بنسبة (4.9%). ولم يسجل إنتقال فيروس موزايك الفصاة بواسطة البذور.

الشعير المختبرة وفي 7 أصناف من القمح الصلب. كما أظهرت الدراسة بواسطة إجراء التحاليل البيولوجية عن إمكانية انتقال الفيروس عن طريق البذور والعدوى الميكانيكية.

V 49

حصر الأمراض الفيروسية على القرعيات في جنوب سورية وغربة مقاومة بعض أصناف القرعيات تجاه الإصابة الطبيعية بالفيروسات. هدى قواص، قسم وقاية النبات، كلية الزراعة، جامعة دمشق، سورية، البريد الإلكتروني houdakawas@yahoo.com

أجري مسح حقل خلال الفترة ما بين 1996 إلى 2001، لتحديد أهم الفيروسات التي تصيب القرعيات في جنوب سورية، جمعت خلالها 2140 عينة نباتية من أنواع القرعيات أبدت أعراضاً نموذجية للإصابة بالأمراض الفيروسية، وشمل المسح 122 حقلاً في محافظات دمشق وريف دمشق ودرعا. أظهرت النتائج ارتفاع نسبة الإصابة بالأعراض الظاهرية الفيروسية في موسمي 1997/1998 و 1998/1999 مقارنة مع باقي المواسم، لوحظت أعلى نسبة إصابة في الكوسا (89%) خاصة في العروة الخريفية في ريف دمشق، وتراوحت النسبة المئوية للإصابة بناءً للأعراض الظاهرية للفيروسات 46-89%، 8-45%، 7-18%، 9-21%، 5-10%، 6-12% و 1-3% في حقول الكوسا، الخيار، الشمام، البطيخ الأحمر، اليقطين، القثاء، العجور والليف، على التوالي خلال مواسم الدراسة. أظهرت الاختبارات المصلية للعينات بواسطة ELISA وجود 11 فيروساً تصيب القرعيات بصورة طبيعية وبنسب متفاوتة. وحقق فيروس الموزايك الأصفر في الكوسا أعلى نسبة إصابة في عينات الكوسا (62.6%)، وكانت النسبة المئوية للعينات المصابة بأكثر من فيروس واحد 40%. بلغت النسبة المئوية للإصابة في أنواع القرعيات المختبرة وفق الأهمية 57.7، 32.8، 23.8، 23.2، 23.1، 22.6، 19.7، 13.6، 8.5 و 5.0 و 5.0% وذلك بفيروس الموزايك الأصفر في الكوسا، فيروس التبغ الحلقي في الباباظ، فيروس موزايك الكوسا، فيروس الذبول البقعي في البندورة، فيروس موزايك الخيار، فيروس اصفرار القرعيات المنقول بالمن، فيروس موزايك البطيخ الأحمر-2، فيروس الترقط الأصفر في الكوسا، فيروس موزايك الفصّة، فيروس البقع الميتة في الشمام وفيروس الموزايك والتبرقش الأخضر في الخيار، على التوالي. في هذا البحث لأول مرة يتم تسجيل فيروس اصفرار القرعيات المنقول بالمن وفيروس الذبول البقعي في البندورة على القرعيات في سورية، وهناك مؤشرات على وجود فيروسات أخرى. أدت تجارب غربة أصناف وأنواع القرعيات (30 صنفاً من الكوسا، 23 صنفاً من الخيار، 21 صنفاً من الشمام/البطيخ الأصفر والبطيخ الأحمر وأصناف محلية من القثاء واليقطين والقرع والقرع العسلي والعجور والليف) تجاه الإصابة الطبيعية للفيروسات خلال مواسم الدراسة الأربعة في دمشق (أبو جرش) إلى وجود أصناف مقاومة وأخرى متحملة والتي يمكن إدخالها ضمن برامج تربية لمقاومة الفيروسات، وأبدت أصناف وهجن الكوسا (R- ZYMV، Romy، Omega، Claudina، Shamy، Salama F1، Joud، karam، Amcobella، Sahar، XP 4843396، CX 4712287، Malika، Nour F1، Zahra، CX 4710507، BX3313897، 1019، VGS 234007 و Samara) مقاومة وتحملًا للإصابة الفيروسية، وأبدت أصناف وهجن الخيار (GGF7119002، Reia، Bondone، Prince، Jericho، Zena، Doora، Samara) مقاومة وتحملًا للإصابة الفيروسية، وأبدت أصناف وهجن الشمام (BA1045 F1، GCF7199، Mercedes، Rania، Super45، Concert، Androws، Shaize) مقاومة للإصابة. وتفاوتت أصناف وأنواع القرعيات المختبرة في درجة تحملها للإصابة، وأبدى بعضها مقاومة نتيجة الإعداء الميكانيكي عند استخدام العزلات SSq.15.96، SCu.12.96 و SM.3.98 من فيروس الموزايك الأصفر في الكوسا. وأبدت أصناف محلية من اليقطين والليف تحملًا للإصابة الفيروسية ضمن الظروف الحقلية ولبعض عزلات فيروس الموزايك الأصفر في الكوسا.

V 50

انتاج هجين جيل أول من القرع مقاوم لفيروس الموزايك الأصفر للكوسا. عبد الباسط عباس الجنابي وسراب عبد الهادي، قسم أمراض النبات، دائرة البحوث الزراعية وتكنولوجيا الغذاء، وزارة العلوم والتكنولوجيا، ص.ب. 765، بغداد، العراق، البريد الإلكتروني: ealmaarroof@yahoo.com

تم الحصول على خمسة سلالات نقية من قرع الكوسا باعادة تأصيل الصنف Clarita type والهجين Ghazalah بالتلقيح الذاتي والانتخاب لستة أجيال متتالية، وأخضعت لإختبار قابلية التلقيح المتبادل. وقد تفوقت التصلبات 2014*2020، 2015*2017 و 2015*2019 على بقية التصلبات في الإنتاجية، وكان التصلب 2015*2019 أفضلها. وتفوق التصلب الأخير على التصلبات الأخرى في مقاومته المعتدلة لفيروس الموزايك الأصفر للكوسا (Zucchini yellow mosaic virus).

Cyclon (حساس) بنوعين من المبيدات الحشرية الكاسية للذبور [جاوشو (Imidacloprid) بتركيز 1.4 غ مادة فعالة /كغ بذار، وأكثرًا (Thiamethoxam) بتركيز 0.5 غ مادة فعالة/كغ بذار]. زرعت الذبور المعاملة بالمبيدات في الحقل بالإضافة إلى معاملة الشاهد (غير معاملة بالمبيدات)، ومن ثم أعدت جميع المعاملات بحشرات المنّ الحاملة لفيروس اصفرار وتقزم الشعير في مرحلة الثلاث ورفات. أظهرت النتائج أن مبيد Imidacloprid خفض من النسبة المئوية للإصابة بالفيروس في الصنفين Sutter و Cyclon من 98 و 100% (في قطع الشاهد غير المعاملة بالمبيد) إلى 62 و 84% (في القطع المعاملة بالمبيد)، على التوالي. في حين لم يكن للمبيد Thiamethoxam أي تأثير في نسبة الإصابة بالفيروس.

V 47

انتخاب نباتات الشعير الحاملة للمورثيين *Yd2* و *Yd3* المقاومين لفيروس اصفرار وتقزم الشعير باستخدام المؤشرات الجزيئية الدناوية. هيثم السيد، صفاء قمري، مايكل باوم، و داد غلام، ستيفانيا غراندي و خالد مكوك، (1) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية.

يعد فيروس اصفرار وتقزم الشعير (*Barley yellow dwarf virus; BYDV*) (عائلة *Luteoviridae*) من الأمراض الفيروسية المهمة التي تصيب محاصيل الحبوب في العالم. تتميز أعراض الإصابة بهذا الفيروس بتقزم النباتات المصابة وتشوه الأوراق وتجفاف الحبوب. ومن أهم الطرائق للتقليل من الخسائر الاقتصادية الناتجة عن الإصابة بهذا الفيروس هي استخدام أصناف مقاومة أو متحملة للمرض. تم الكشف عن عدد من المورثات المقاومة لهذا الفيروس ومن أهمها *Yd2* الموجودة على الصبغي 3H في الشعير. كما تم تحديد عدد من مواقع الصفات الكمية (QTL) المسؤولة عن تحمل الإصابة لهذا الفيروس في العديد من أنواع الشعير والقمح. ويأتي مورث المقاومة *Yd3* في المرتبة الثانية من حيث الأهمية لمقاومة فيروس اصفرار وتقزم الشعير. استخدم في هذه الدراسة 88 طرازاً وراثياً من الشعير الأثيوبي المحفوظة في معهد فافلوف والبنك الوراثي التابع لإيكاردا. زرعت بذور هذه الطرز الوراثية في الحقل خلال الموسم الزراعي 2002/2003، ثم أعدت جميع النباتات في مرحلة البادرة بفيروس اصفرار وتقزم الشعير بواسطة حشرات المنّ *Rhopalosiphum padi* الحاملة للفيروس (بمعدل 10-15 حشرة/نبات الواحد). بعد 30 يوم من العدوى، فحصت جميع النباتات باستخدام بصمة النسيج النباتي (TBIA) لتحديد تركيز فيروس اصفرار وتقزم الشعير فيها. وفي مرحلة النضج، تم حصاد 107 نباتات من 19 طرازاً وراثياً بشكل فردي (أظهرت هذه النباتات أعراض خفيفة وكان تركيز الفيروس قليلاً). زرعت بذور هذه النباتات في الموسم التالي تحت ظروف البيت البلاستيكي للمزيد من الدراسة، حيث فحصت البادرات (10 بادرات/طرز) باختبار التفاعل السلسلي البوليميري (PCR) للكشف عن مورث المقاومة *Yd2* باستخدام البادرات المتخصصة YLP-CAPS. أظهرت النتائج أن 38 نباتاً تمثل 14 طرازاً وراثياً لا تحتوي على المورث *Yd2*. فحصت تلك النباتات، كما فحصت نباتات من خمسة أصناف مقاومة للفيروس وتحمل مورث المقاومة *Yd2* (Laural، Ligne527/NK//JLB، Sutter/Sutter*2/Numare، Wysor، QB813.2) وكذلك صنفين قابلين للإصابة بفيروس اصفرار وتقزم الشعير (Morrison و Cyclon) بواسطة خمسة مؤشرات جزيئية وراثية (HVM22، HVM14، HVM65، HVM74 و Bmac0018) التي ترتبط بالقرب من مورث المقاومة *Yd3* الموجود على الصبغي 6H. أظهرت النتائج بأن بعض الأباء يحمل مورث المقاومة *Yd2* فقط (مثل Wysor)، أو مورث *Yd3* فقط (مثل Granada) أو المورثيين معاً *Yd2* و *Yd3* (مثل Laural). وعكس المؤشر Bmac0018 أليل المقاومة في جميع النباتات المقاومة (38 نباتاً) والتي لا تحوي على المورث *Yd2*. ومن الواضح في هذه الدراسة، أن مورثي المقاومة *Yd2* و *Yd3* قد خفضا من نسبة الإصابة بالعزلة الفيروسية المستخدمة في هذه الدراسة. ويؤمن توافر مثل هذه المؤشرات الجزيئية الوراثية سرعة الكشف عن أحد مورثات المقاومة أو الاثنين معاً في صنف واحد. يعد استخدام التفاعل السلسلي البوليميري (PCR) لانتخاب الأصناف التي تحمل مورثات المقاومة طريقة سريعة وفاعلة، حيث يمكن تقويم آلاف الأصناف لمعرفة درجة قابليتها للإصابة بفيروس اصفرار وتقزم الشعير عندما تكون النباتات في مرحلة البادرة لمعرفة احتوائها على المورثين *Yd2* أو *Yd3*، واحتمال أيضاً الكشف عن مورثات مقاومة أخرى.

V 48

دراسة عن فيروس موزايك الشعير المخطط في الجزائر. خالدية مجاهد، قسم الزراعة، مختبر الفيروسات، جامعة بليدا، بليدا، الجزائر، البريد الإلكتروني: hanene_2@yahoo.fr

انهدف الرئيسي من هذه الدراسة هو كشف وتشخيص وجود فيروس موزايك الشعير المخطط في 37 صنفاً من الشعير و 10 أصناف من القمح الصلب. اجريت الدراسة في محطتين تجريبيتين للأبحاث الزراعية (واد سمار وبني سليمان) بالجزائر. وقد استخدمت طريقة إختبار اليزا (DAS-ELISA) في الكشف عن وجود الفيروس. كما تم دراسة وبائية المرض في محطة أبحاث المعهد الزراعي في مدينة البليدة وذلك لغرض متابعة تطور المرض وفقاً للأطوار المختلفة من عمر النبات. أظهرت نتائج الإختبارات السيرولوجية (إختبار اليزا) وجود فيروس موزايك الشعير المخطط في 26 صنفاً من أصناف

الموسم الزراعي 2005/2004 في ثلاث مواقع في سورية (تل حديا ويحمل التابعين لمحافظة حلب وحران التابع لمحافظة ادلب). أظهرت النتائج انخفاض نسبة الإصابة بالفيروس وارتفاع الإنتاجية في كل المواقع عند الزراعة ضمن الفترة ما بين 1-5 كانون الأول/ديسمبر مقارنة بموعد الزراعة المتأخر (15-30 كانون الثاني/يناير). كما أظهرت النتائج أن الكثافة النباتية المنخفضة (200 بذرة/م²) كانت أكثر عرضة للإصابة (343.3%) من الكثافة العالية (300 بذرة/م²) (أقل من 5%). وكانت معاملة البذور قبل الزراعة بالمبيد الحشري جاوشو (Imidacloprid) (1.8 غ مادة فعالة/كغ بذور) أفضل المعاملات الكيميائية في تخفيض نسبة الإصابة بالفيروس، في حين لم يكن لمبيد بريمر (Primicarb) أي تأثير في نسبة الإصابة بالفيروس عند رشه 5 مرات خلال موسم النمو بنسبة 0.2 غ مادة فعالة/ليتر.

V 45

فيروس تقزم واصفرار الشعير في تونس: انتشاره على محصول الشعير، تأثيره في الغلة وإيجاد أصناف مقاومة له. أسماء نجار¹، عبد الرزاق دعلول¹، خالد مكوك² وصفاء قمري². (1) المعهد الوطني للبحوث الزراعية بتونس، نهج الهادي كراي، 2049 أريانة، تونس، البريد الإلكتروني: najar.asma@iresa.agrinet.tn؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حاب، سورية.

أجري مسح حقلي خلال الفترة ما بين 2000-2005 لأهم المناطق الرئيسية لزراعة الشعير في تونس (باجة، الوطن القبلي، بنزرت، الكاف، الكريب، زغوان والقيروان) للتحري عن فيروس تقزم واصفرار الشعير (*Barley yellow dwarf virus*) (BYDV، عائلة *Luteoviridae*). جمع خلالها حوالي 200 نبات عشوائيا و15-20 نباتا تحسب أعراضا توحي بإصابة فيروسية من كل حقل. فحصت جميع العينات باختبار بصمة النسيج النباتي المناعي (TBIA) لتكشف عن الفيروس. تباينت نسبة الإصابة بفيروس اصفرار وتقزم الشعير (بشكل عام الطراز PAV) في محصول الشعير ما بين المناطق، وترواحت نسبة الإصابة ما بين 1.2-30.97% في العينات المجموعة عشوائيا من محصول الشعير (5.45، 14.46، 30.97، 7.66، 15.37، 2.35 و 1.2% المجموعة من باجة، الوطن القبلي، بنزرت، الكاف، الكريب، زغوان والقيروان، على التوالي). أجريت تجربة حقلية في محطة بحوث بيجا، تم خلالها دراسة تأثير كاسيات البذور في نسبة انتشار فيروس اصفرار وتقزم الشعير، وذلك بمعاملة بذور 4 أصناف من الشعير (منال، ريحان، ممتاز ومارتن) بالمبيد الحشري الكسي للبذور [جاوشو (Imidacloprid) بتركيز 2 غ مادة فعالة/كغ بذور]. زرعت البذور المعاملة بالمبيد في الحقل بالإضافة إلى معاملة الشاهد (غير معاملة بالمبيد)، ومن ثم أعدت جميع المعاملات بحشرات المن الحاملة لفيروس اصفرار وتقزم الشعير في مرحلة ورقيتين. أظهرت النتائج أن مبيد الحشري جاوشو خفض من النسبة المئوية للإصابة بالفيروس بمعدل 97% (في القطع غير المعاملة بالمبيد) إلى 28.5% (في القطع المعاملة بالمبيد). تم دراسة الانعزالات لـ 10 مجموعات ناتجة من تصاب صنفين من الشعير أحدهما يحمل مورث المقاومة yd2 والآخر ملائم للظروف التونسية، وذلك من الجيل الثاني F2 حتى الجيل الخامس F5. تم الحصول على حوالي 200 خط من الشعير مقاومة للفيروس وتحمل المورث المقاوم للفيروس yd2.

V 46

تأثير عمر النبات عند الإعداء بفيروس اصفرار وتقزم الشعير في إنتاجية الشعير وإمكانية مكافحته بكاسيات البذور. وداد غلام، صفاء قمري وخالد مكوك، مختبر الفيروسات، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org

يعد فيروس اصفرار وتقزم الشعير (*Barley yellow dwarf virus*) من الفيروسات المهمة التي تسبب خسارة كبيرة في إنتاجية محصول الشعير، وترتبط نسبة الخسارة بالأصناف المزروعة وبممر النبات عند الإصابة. أجريت تجربة حقلية في موقع تل حديا- إيكاردا لدراسة تأثير فيروس اصفرار وتقزم الشعير في إنتاجية محصول الشعير عند إعدائه بالفيروس في مراحل متباينة من عمر النبات. استخدم في التجربة أربعة أصناف من الشعير تختلف في درجة حساسيتها للإصابة بالفيروس؛ صنفان منها (Sutter و Atlas-86) يمتلكان مورث المقاومة للفيروس (Yd2) وصنفان آخران (Atlas-57 و Cyclon) لا يمتلكان هذا المورث. أجريت العدوى بحشرات المن (*Rhopalosiphum padi*) المكتسبة لفيروس اصفرار وتقزم الشعير "طراز PAV" في ثلاث مراحل من عمر النبات (مرحلة الثلاث رقات، مرحلة الإشتاء ومرحلة الاستطالة). أظهرت النتائج تباينا في نسبة الخسارة في إنتاجية محصول الشعير من صنف إلى آخر نتيجة الإصابة بالفيروس، وكانت المراحل المبكرة من عمر النبات أكثرها حساسية للإصابة بالفيروس. بلغت نسبة الخسارة في الغلة عند الصنف الحساس (Cyclon) 72، 94، و 39%، وعند الصنف متوسط الحساسية (Atlas-57) 40، 26، و 43% وفي الصنف (Atlas-68) 14، 3 و 3% وفي الصنف (Sutter) 13، 14 و 6%، وذلك نتيجة إعدائه في مراحل النمو الثلاثة المذكورة أعلاه، على التوالي. وفي تجربة أخرى، تم دراسة تأثير كاسيات البذور في نسبة انتشار فيروس اصفرار وتقزم الشعير، وذلك بمعاملة بذور الصنفين Sutter (مقاوم)

البادرات ذات عمر 21 يوماً وجود نسبة أعلى من البادرات المصابة (17% في الصنف سيرفير و 12.5% في صنف الوادي الجديد) مقارنة بما قدر بطريقتي الأليزا والقدرة الإعدائية.

V 43

دراسه مقارنة بين الإختبارات المصلية/السيرولوجية المختلفة للكشف عن فيروس موزايك البرسيم الحجازي/الجت. مرفت فتح الله، جابر فجله² ويحيى الفحام². (1) معهد بحوث أمراض النباتات، مركز البحوث الزراعية، محطه بحوث الصباحية، الاسكندرية، مصر، البريد الإلكتروني: mmmf-1992@yahoo.com؛ (2) قسم أمراض النباتات، كلية الزراعة، جامعة الاسكندرية، الاسكندرية، مصر.

تم مقارنة حساسية ثلاثة من الإختبارات السيرولوجية/المصلية هي: الأليزا غير المباشرة (Indirect ELISA) والارتباط المناعي النقطي (DIA) وبصمة النسيج النباتي (TBIA) للكشف عن فيروس موزايك البرسيم الحجازي/الجت في الأجزاء المختلفة لنباتات تبغ جلوتينوزا وكذلك الأوراق بعد فترات مختلفة من العدوى. أوضحت النتائج أن إختبار الأليزا غير المباشرة أكثر الطرائق المستخدمة حساسية، وأمكنها الكشف عن الفيروس في عصير النبات المستخلص من الجذور والسوق والأوراق المخفف حتى 1:10³، 1:10⁴، 1:10⁵، على التوالي. وأمكن إختبار الارتباط المناعي النقطي للكشف عن الفيروس في العصارة المستخلصة من جذور وسوق وأوراق النباتات المصابة حتى تخفيف 1:10²، 1:10³، 1:10⁴، على التوالي، هذا وأمكن الكشف بسهولة عن الفيروس بواسطة بصمة النسيج النباتي في جذور وسوق وأوراق النباتات المصابة. أظهرت نتائج الإختبارات السابقة للكشف عن الفيروس في مستخلص مخفف 1:100 من أوراق النباتات المصابة بعد فترات مختلفة من العدوى، تساوي حساسية الأليزا غير المباشرة والارتباط المناعي النقطي في الكشف عن الفيروس. فأمكنها الكشف عن الفيروس بعد 8، 16 و 24 يوماً من العدوى، بينما تم الكشف عن الفيروس في حالة بصمة النسيج النباتي بعد 4، 16، 18 و 24 يوماً من العدوى.

V 44

فيروس تقزم واصفرار الشعير: تواجهه على المحاصيل والأعشاب النجيلية، تأثيره في الغلة ومكوناتها والإدارة المتكاملة له تحت الظروف السورية. عادل العنسي¹، صفاء قمري²، أمين حاج قاسم¹، خالد مكوك² وإسماعيل محرم³. (1) كلية الزراعة، جامعة حلب، حلب، سورية؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org؛ (3) الهيئة العامة للبحوث والإرشاد الزراعي، ص.ب. 87285، زمار، اليمن.

تم التحري عن فيروس تقزم واصفرار الشعير (*Barley yellow dwarf virus*) (BYDV، عائلة *Luteoviridae*) من خلال إجراء مسح حقلي لـ 117 حقلاً (28 شعير، 84 قمح، 2 شوفان و 3 ذرة صفراء)، اختيرت بشكل عشوائي، في المناطق الشمالية والوسطى والجنوبية والشرقية من سورية، وذلك خلال الموسمين الزراعيين 2003/2004 و 2004/2005. جمع خلالها حوالي 200 نبات عشوانيا و 15-20 نباتا تظهر أعراضا توحى بإصابة فيروسية من كل حقل. فحصت جميع العينات بإختبار بصمة النسيج النباتي المناعي (TBIA) للكشف عن الفيروس. تباينت نسبة الإصابة بفيروس اصفرار وتقزم الشعير (بشكل عام الطراز PAV) ما بين محاصيل الشعير والقمح والشوفان والذرة الصفراء، حيث بلغت نسبة الإصابة 4.1، 33 و 5% في العينات المجموعة عشوانيا و 14.6، 9.3، 62.5 و 17.5% في العينات الحاملة لأعراض إصابة فيروسية، للمحاصيل الأربعة السابقة، على التوالي. كما تم تعقب الفيروس على الأعشاب الموجودة خلال الفترة من كانون الثاني/يناير - تشرين الثاني/نوفمبر لعام 2005 من خلال زيارات حقلية بمعدل زيارة واحدة كل أسبوعين لتسعة حقول حول موقع تل حديا (شمال سورية)، اتبعت فيها دورة زراعية ضمت محاصيل نجيلية/محاصيل صيفية (القطن، الذرة الصفراء أو البطاطا/البطاطس). دلت نتائج الإختبارات السيرولوجية على إصابة ثلاثة أعشاب حولية نامية في حقول الشعير والقمح بفيروس اصفرار وتقزم الشعير (الطراز PAV) [الشوفان البري (*Avena sterilis* L.)، الشيلم (*Lolium rigidum* Gaud.) والقنبيعان/حشيشة الكناري (*Phalaris* spp.)]، وعشبين معمرين [الحليان/حشيشة جونسون (*Sorghum halepense* L.) والنجيل الإصبعي (*Cynodon dactylon* (L.) Pers.)]، وعشبين صيفيين حوليين [اللزيق (*Setaria viridis* (L.) P.B.) و أبو ركية (*Echinochloa colonum* (L.) Link.)]. ويعتبر هذا التسجيل الأول لإصابة جميع هذه الأعشاب بفيروس اصفرار وتقزم الشعير في سورية. عند دراسة تأثير الفيروس في الغلة ومكوناتها لصنف الشعير "علندا" (صنف سوري) تحت ظروف العدوى الاصطناعية في الحقل، سبب الفيروس فقدا في الغلة الحبية بنسبة 82% وفي الكتلة الحيوية (وزن الحبوب والقش) 76% وفي وزن الألف حبة 30%. بالإضافة لذلك، نفذت تجارب حقلية تضمنت تأثير كل من موعد الزراعة والكثافة النباتية وبعض المعاملات الكيميائية وتداخلاتها بهدف التقليل من أضرار الإصابة بفيروس اصفرار وتقزم الشعير ضمن برنامج إدارة متكاملة وباستخدام صنفين من الشعير "عرطة وسايكلون" المعروفين بحساسيتهما الشديدة للإصابة بالفيروس. أجريت التجارب خلال

المرضة الفيروسية حيث تستخدم هذه المعلومات في التكهن بشدة الإصابة الفيروسية، بالإضافة إلى توظيف بيانات الأرصاد الجوية خاصة درجات الحرارة اليومية والتي لها علاقة مباشرة بانتشار الناقلات الحشرية لفيروس اصفرار وموت الفول. وبعد ثمان سنوات من تجريب طرائق عديدة لمكافحة هذه الناقلات ونجاح بعضها أمكن توظيفها للاستفادة منها وباستخدام أساليب متعددة ومتكاملة. وتعتمد نظم الإدارة المتكاملة لمكافحة الناقلات الحشرية للأمراض الفيروسية في الفول البلدي على ثلاث محاور هي: أساليب فنية مختلفة في مكافحة - تحديد شدة الإصابة بدقة قبل الزراعة - التكتيكات التي تتبع في التنفيذ ونشر المعلومات للمزارعين باستخدام الإدارة المركزية للإرشاد الزراعي في مصر. ولقد ثبت قبول ونجاح نظام الإدارة المتكاملة لمكافحة الناقلات الحشرية لهذه الأمراض في الفول البلدي بمصر خلال السنوات الثمان الماضية، مما أدى إلى زيادة متوسطات الإنتاج والعائد المادي والاجتماعي واسترداد ثقة المنتجين، بالإضافة إلى فوائد بيئية عديدة.

V 41

فيروسات البقوليات العلفية في سورية: التوزع، الانتشار والانتقال بالبذور. محمد جمال محمد سعيد مندو¹، هدى زاهي قواص²، خالد محي الدين مكوك³ وصفاء غسان قمري³. (1) قسم بحوث الأمراض، إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني jamalagr@mail.sy؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، سورية؛ (3) مختبر الأمراض الفيروسية، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني S.Kumari@cgiar.org
أجري مسح حقلي لتحديد انتشار أهم الفيروسات التي تصيب البقوليات العلفية (فصّة معمرة، برسيم، بيقية، جلبانة، كرسنة) في سورية خلال الموسمين الزراعيين 2001/2002 و 2003/2002. تمت زيارة 47 حقلا جمع منها 5656 عينة (5300 عينة جمعت بطريقة عشوائية لتحديد النسبة المئوية للإصابة و 356 عينة تبدي أعراضا توحي بإصابات فيروسية). أظهرت الإختبارات المصلية (بصمة النسيج النباتي المناعية TBIA) للعينات المجموعة عشوائيا من حقول الفصّة المعمرة في الموسم الزراعي الأول 2002/2001 أن فيروس موزايك الفصّة (AMV) هو الأكثر انتشارا (19.96%)، تلاه الفيروسات المسببة للاصفرار التابعة لعائلة Luteoviridae (12.2%)، ثم فيروس موزايك الخيار (CMV) (7.37%)، وفيروس الموزايك الأصفر للفاصولياء (BYMV) (5%). أما في الموسم الزراعي الثاني 2003/2002 فقد لوحظ انتشار ضئيل لكل من فيروس موزايك الفصّة (1.91%)، فيروس موزايك البازلاء المنقول بواسطة البذور (0.87%) (PSbMV)، والفيروسات المسببة للاصفرار (3.87%). أظهرت الإختبارات المصلية أن الفيروسات المسببة للاصفرار تمثلت بفيروس التفاف أوراق الفول (BLRV) وفيروس تقزم فول الصويا (SbDV) وفيروس الاصفرار الغربي للشوندر (BWYV) في حين لم يتفاعل من هذه العينات مع أي من الأجسام المضادة ضمن هذه المجموعة. بالإضافة لذلك وجد بأن 173 عينة لم تتفاعل مع أي من الأجسام المضادة المستخدمة رغم وجود أعراض توحي بإصابة فيروسية. لدى فحص بذور من الفصّة المعمرة جمعت من خمسة مواقع (بذرة/موقع) تمثل المحلات التجارية التي تباع البذور المحلية للمزارعين للكشف عن الفيروسات التي تنتقل بالبذور، تم الكشف عن فيروس موزايك الفصّة في بذور موقعين بنسبة 0.6 و 0.2%.

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فيروس موزايك البرسيم الحجازي/الجت: مداه العائلي، تنقيته، طرق انتقاله وتفاعلاته السيولوجية. جابر فجله¹، يحيى الفحام¹ ومرفت فتح الله². (1) قسم أمراض النبات، كلية الزراعة، جامعة الإسكندرية، الإسكندرية، مصر، البريد الإلكتروني: mahakawanna@yahoo.com، gaberfegla@yahoo.com؛ (2) معهد بحوث أمراض النبات، مركز البحوث الزراعية، الإسكندرية، مصر.

تم عزل وتعريف ثلاث عزلات لفيروس موزايك البرسيم الحجازي/الجت (*Alfalfa mosaic virus*)، من نباتات برسيم حجازي مصابة طبيعياً بمحافظة البحيرة في مصر، وتنبأين في شدة أعراضها. استخدمت طريقتان لتنقيته عزلته الفيروس رقم 1 من تبغ *Nicotiana glutinosa*، إذ بلغ محصول الفيروس المنقى بالطريقة الأولى 15 مغ وبالطريقة الثانية 26.82 مغ لكل 100 غ وزن رطب من الأوراق. تم تحضير مصل مضاد لهذه العزلة الذي تفاعل بدرجة عالية ومتشابهة مع العزلتين 1 و 2 وبدرجة أقل مع العزلة 3 في إختبار الترسيب الدقيق والاليزا غير المباشرة. نقل الفيروس بواسطة أربعة أنواع من المنّ بالطريقة غير المستمرة وكان أكثرها كفاءة في النقل من اللوبياء (*Aphis craccivora*)، بينما لم ينجح من الذفلة (*A. nerii*) في نقله. كما انتقل الفيروس عن طريق بذور نباتات البرسيم الحجازي المصابة. وأظهرت نتائج الكشف عن الفيروس في البذور وأجزائها (القصرة والجنين) والبادرات الناتجة عنها لصنفي سيرفير والوادي الجديد أن الاليزا غير المباشرة أكثر حساسية من إختبار القدرة الإعدائية. هذا ولم يلاحظ الأنتجين الفيروسي بواسطة إختبار القدرة الإعدائية في قصره البذور المفصولة عند الصنفين. أما في حالة البادرات فقد كانت نسبة الإصابة أعلى في البادرات ذات عمر 21 يوماً مقارنة بالبادرات ذات عمر 5 أيام، وذلك عند استخدام الاليزا وإختبار القدرة الإعدائية. وأظهر إختبار بصمة النسيج النباتي عند الكشف عن الفيروس في

الحشري بيريمور (Primicarp) بنسبة 0.2 غ مادة فعالة/ليتر، أو الزيت المعدني الصيفي (زيت برفيني، 3%)، في انتشار فيروس الموزاييك الأصفر للفاصولياء خلال الموسم الزراعي 2005/2004 في موقع تل حديا (إيكاردا).

V 39

الإدارة المتكاملة للفيروسات التي تصيب محصول الفول والمنقولة بواسطة حشرات المن في الساحل السوري. رنا الجلاد¹، صفاء قمري² وعماد اسماعيل¹. (1) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية؛ (2) مختبر الفيروسات، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org

أجريت تجارب حقلية على محصول الفول في منطقة الساحل السوري خلال الموسمين الزراعيين 2005/2004 و 2006/2005 لدراسة عدد من عناصر الإدارة المتكاملة [مواعيد الزراعة، كثافة نباتية، معاملة البذور قبل الزراعة بالمبيد الحشري جاوشو (Imidacloprid) Gaucho]، رش النباتات بالمبيدات الحشرية الجهازية والزيت المعدني خلال فصل النمو، استعمال سجاج من نباتات القمح حول التجربة بغية التقليل من الإصابة بالفيروسات التي تنقل بواسطة حشرات المن. أظهرت النتائج ارتفاع نسبة الإصابة بالفيروسات في الزراعة المبكرة (منتصف تشرين الثاني/نوفمبر) (75%) مقارنة بالزراعة المتأخرة (بداية كانون الأول/ديسمبر) (5%). وكانت معاملة البذور بالمبيد الحشري Imidacloprid بمعدل 1.4 غ مادة فعالة/1 كغ بذور فول قبل الزراعة فاعلة جدا، وكانت نسبة الإصابة بالفيروسات في القطع المعاملة بالمبيد أقل بحوالي 30-35% مقارنة بالقطع التي لم تعامل بذورها بالمبيد، وكانت هذه الفروقات معنوية. كما انخفضت نسبة الإصابة بالفيروسات في القطع التي كان معدل كثافة نباتاتها عالية (33 بذرة/م²) بنسبة 10% مقارنة مع القطع التي كانت مزروعة بكثافة منخفضة (22 بذرة/م²). ولم يكن لمعاملات الرش بعد الزراعة سواء بالمبيد بيريمور (Pirimcarb) (بمعدل 0.2 غ مادة فعالة/ليتر) أو بالزيت المعدني أو بالمبيد والزيت المعدني معا تأثير يذكر في خفض نسبة الإصابة بالفيروسات المنقولة بحشرات المن بالطريقة المثابرة. وأسهمت معاملات الرش بالزيت المعدني + المبيد الحشري أو الزيت المعدني لوحده بدور بسيط في خفض نسبة الإصابة بالفيروسات المنقولة بحشرات المن بالطريقة غير المثابرة، وذلك مقارنة بالمعاملات التي تركت بدون رش. وتجدر الإشارة إلى أن نسبة الإصابة بالفيروسات المنقولة بالطريقة المثابرة (مثل فيروس اصفرار الفول والفيروسات التابعة لمجموعة الاصفار *Luteoviridae*) كانت أعلى بكثير من الفيروسات المنقولة بالطريقة غير المثابرة (مثل فيروس موزاييك الاصفار للفاصولياء وفيروس ذبول الفول) في كلا الموسمين الزراعيين. كما وجد أيضا بأن عمل سجاج من نباتات القمح حول تجربة الفول لم يكن له أي دور في خفض نسبة الإصابة بالفيروسات المنقولة بحشرات المن بالطريقة المثابرة، في حين اسهم السجاج إلى حد بسيط في تقليل نسبة الإصابة بالفيروسات المنقولة بالطريقة غير المثابرة. بالإضافة لذلك، فقد كانت نسبة الإصابة بالفيروسات المنقولة بحشرات المن تحت الظروف الطبيعية للساحل السوري أعلى في الموسم الزراعي الثاني منه في الموسم الزراعي الأول. وكانت نتائج هذه الدراسة مشابهة جدا للحالة الصحية في معظم حقول المزارعين في المنطقة الساحلية. أظهرت النتائج أن تأخير الزراعة مع معاملة البذور بالمبيد الحشري Imidacloprid وبكثافة نباتية 33 نبات/م² يمكن أن يكون خيارا لإدارة فاعلة لتخفيض نسبة الإصابة بفيروسات الفول في الساحل السوري.

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الإدارة المتكاملة لمكافحة الناقلات الحشرية لفيروس اصفرار وموت الفول في حقول المزارعين في مصر باستخدام نظام قواعد البيانات. جودة محمد الدفراوي¹، مجدي الحريري¹، حامد عيد السداي محمد¹، لطيف رياض رزق الله² ورشاد أبو العينين³. (1) معهد بحوث وقاية النباتات، 7 شارع نادى الصيد، ال قى، القاهرة، مصر، البريد الإلكتروني: Aya-Gouda@hotmail.com؛ (2) معهد بحوث أمراض النباتات؛ (3) معهد بحوث المحاصيل الحقلية، مركز البحوث الزراعي، الحيزة، القاهرة، مصر.

يعدّ الفول البلدي من أهم المحاصيل البقولية في مصر والذي تعرض خلال السنوات الماضية لانهايار في مستوى الإنتاج المحلي، بسبب الإصابات الوبائية المتكررة للآفات الحشرية الناقلة للمسببات المرضية الفيروسية (من أهمها فيروسي اصفرار وموت الفول وإلتفاف أوراق الفول)، مما تسبب في خسائر فادحة في مستوى الإنتاج المحلي للمحصول. وهذان الفيروسان ينتقلان بواسطة حشرات المن بالطريقة المستمرة وعلى الأخص من اللوبياء *Aphis craccivora* ومن البازلاء الأخضر *Acyrtosiphon pisum*. استخدم لمكافحة هذه الأمراض وسائل متعددة بالاعتماد على المعلومات البيئية التي توافرت خلال الدراسات المكثفة في فترة العشر سنوات القليلة الماضية في مصر، خاصة دراسة سلوك هذه الناقلات والمؤثرات البيئية الأحيائية واللاأحيائية. وثبت أن رصد ميعاد ظهور المهاجرات من هذه الناقلات على نباتات العائلة البقولية وغيرها من العوائل البديلة خلال موسم الخريف في 20 منطقة ممثلة وموزعة بطريقة مدروسة وباستخدام قراءات مباشرة وإختبار لحشرات المن الحية المصطادة بالمصائد المائية الصفراء، بالإضافة إلى استخدام طرائق سيرولوجية/مصلية لتقدير نسب حمل المسببات

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تأثير درجات الحرارة والتخزين في كفاءة إختبار بصمة النسيج النباتي في الكشف عن الفيروسات النباتية. نوران عطار، صفاء قمري وخالد مكوك، مختبر الفيروسات، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org

يعد إختبار بصمة النسيج النباتي (Tissue blot immunoassay) من أرخص وأسرع الإختبارات السيرولوجية/المصلية وأسرعها للكشف عن الأمراض الفيروسية النباتية، ويسمح هذا الإختبار بسهولة نقل العينات المطبوعة على أغشية النيتروسيليلوز إلى أماكن بعيدة لفحصها. هدف هذا البحث إلى معرفة مدى تأثير درجات الحرارة التي تتعرض لها أغشية النيتروسيليلوز أثناء النقل بالبريد ودراسة تأثير فترات التخزين في كفاءة الكشف عن الفيروسات المختلفة المطبوعة على الأغشية. في هذه الدراسة، تم طبع نبات مصاب بفيروس موزايك واصفرار الفاصولياء (*Bean yellow mosaic virus*) ونبات آخر مصاب بفيروس موت واصفرار الفول (*Faba bean necrotic yellows virus*) على أغشية النيتروسيليلوز بعدد كبير من المكررات. حفظت الأغشية المطبوعة بالعينات النباتية عند درجات حرارة مختلفة (درجة حرارة الغرفة مع إضاءة عادية، درجة حرارة الغرفة بدون إضاءة، و 80 °س) ولفترات زمنية مختلفة (10 أيام عند درجة حرارة 80 °س و 9 سنوات عند درجة حرارة الغرفة). اختبرت الأغشية المطبوعة بالعينات النباتية بعد ذلك بالطريقة المتبعة لإختبار بصمة النسيج النباتي وباستخدام مصل مضاد متعدد الكلون لفيروس موزايك واصفرار الفاصولياء ومصل وحيد الكلون لفيروس موت واصفرار الفول مع استعمال شواهد غير معاملة بالحرارة ومطبوعة منذ فترة قصيرة. أظهرت النتائج عدم وجود أي تأثير لفترات التخزين في كفاءة الكشف عن كلا الفيروسين المستخدمين في الدراسة، وتم الكشف عنهما بكفاءة عالية حتى بعد 9 سنوات من التخزين. كما تم الكشف عن كلا الفيروسين المخزنين عند درجة حرارة 80 °س حتى المعاملة الأخيرة (10 أيام)، ولكن شدة التفاعل تناسبت عكسياً مع الفترات الزمنية للمعاملة. أكدت النتائج التي تم الحصول عليها مدى ثبات بنية الفيروس على أغشية النيتروسيليلوز عند تعرضها لظروف تخزين سيئة ولفترات طويلة دون أن يؤثر ذلك في حساسية الكشف عن وجود الفيروس.

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انتشار فيروس الموزايك الأصفر للفاصولياء على محصول الفول في سورية ومكافحته. محمد الخلف¹، صفاء قمري²، أمين عامر حاج قاسم³، خالد مكوك² وصلاح الشعبي⁴. (1) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث حلب، حلب، سورية، البريد الإلكتروني: virology@icarda.exch.cgiar.org؛ (2) مختبر الفيروسات، إيكاردا، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org؛ (3) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية؛ (4) الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية.

أجري مسح حقلّي لتقصي مدى انتشار فيروس الموزايك الأصفر للفاصولياء (*Bean yellow mosaic virus*) (BYMV، جنس *Potyvirus*، عائلة *Potyviridae*) على محصول الفول في أربع مناطق رئيسة في سورية (الساحلية، الشمالية، الجنوبية والوسطى) خلال الموسم الزراعي 2005/2004، تم خلاله جمع 1257 عينة نباتية حاملة لأعراض توحي بإصابة فيروسية و 10785 عينة عشوائية (بمعدل 150-200 عينة من كل حقل) من 67 حقلاً. فحصت جميع العينات المجموعة بواسطة إختبار بصمة النسيج النباتي (TBIA) للكشف عن الفيروس. أظهرت النتائج أن أعلى نسبة إصابة بفيروس الموزايك الأصفر للفاصولياء بناءً للأعراض الظاهرية كانت في المنطقة الساحلية (46.3%)، تلتها المنطقة الشمالية (41.9%) ثم المنطقة الجنوبية (33.8%)، وأخيراً المنطقة الوسطى (2.7%). في حين بلغت نسبة الإصابة بالفيروس في العينات العشوائية بناءً للإختبارات السيرولوجية 14.2، 5.0، 10.0 و 3.0% في المناطق الأربعة السابقة، على التوالي. تم تقييم رد فعل 377 مدخلاً من الفول إزاء فيروس الموزايك الأصفر للفاصولياء مجموعة من 16 دولة مختلفة جغرافياً خلال الموسم الزراعي 2005/2004، وذلك باعداد جميع النباتات في مرحلة البادرة (بعمر 4 أوراق) بالفيروس بالطريقة الميكانيكية تحت الظروف الحقلية، مع ترك مكرر دون إعداء للمقارنة. بينت النتائج بأن جميع المدخلات كانت قابلة للإصابة بالفيروس، وتراوحت نسبة الإصابة تبعاً للأعراض الظاهرية (موزايك، تبرقش، تقزم) التي تطورت على المدخلات المدروسة ما بين 50-100%، عدا المدخلين ILB 474 و BPL 4184 اللذين كانا أقل حساسية للإصابة، حيث بلغت نسبة الإصابة فيهما 40 و 45%، على التوالي. وتراوحت نسبة الفقد في الغلة نتيجة الإصابة بالفيروس تراوحت ما بين 1% (المدخل الوراثي ILB 3059) و 92% (المدخل الوراثي BPL 1399). استخدمت جميع البذور الناتجة من تجربة تقويم المدخلات الوراثية لدراسة مدى انتقال الفيروس بواسطة بذورها. زرعت البذور ضمن صواني من الرمل، ومن ثم فحصت البادرات الناتجة لكل مدخل على حدة باستخدام إختبار بصمة النسيج النباتي للكشف عن فيروس الموزايك الأصفر للفاصولياء. بينت النتائج إمكانية انتقال الفيروس في بذور 25 مدخلاً وراثياً، وتراوحت نسبة انتقاله ما بين 0.51-6.17%، بينما كانت نسبة إنتقاله في بذور 352 مدخلاً وراثياً منخفضة (أقل من 0.5%). وأثرت الإصابة بالفيروس في لون البذور الناتجة وشكلها، مؤدياً إلى انخفاض قيمتها التسويقية وخاصة في صناعة التعليب. ولم يكن هناك تأثير لرش القطع التجريبية 4 مرات خلال موسم النمو بالمبيد

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انتشار ثلاثة فيروسات (BYMV, BCMV, AMV) على محصول الفول البلدي في منطقتي الرياض والقصيم، بالمملكة العربية السعودية. خالد بن عبدالكريم الجمحان وإبراهيم بن محمد الشهبان، قسم وقاية النبات، كلية علوم الأغذية والزراعة، جامعة الملك سعود، ص.ب. 2460، الرياض 11451، المملكة العربية السعودية، البريد الإلكتروني: ishahwan@ksu.edu.sa تم جمع 277 عينة من نباتات الفول البلدي النامية في منطقتي الرياض والقصيم بالمملكة العربية السعودية والتي ظهرت عليها أعراض شبيهة بأعراض الإصابة بالأمراض الفيروسية خلال موسمين زراعيين متتاليين (2002 و 2003) بهدف التحري عن وجود ثلاثة فيروسات الثلاثة [فيروس موزاييك الفصّة/البرسيم الحجازي (AMV)، فيروس موزاييك الفاصولياء الاعتيادي (BCMV)، وفيروس موزاييك واصفرار الفاصولياء (BYMV)]. بينت النتائج المصلية (اختبار اليزا) وجود الفيروسات الثلاثة في المنطقتين وفي كلا الموسمين الزراعيين، وكان فيروس موزاييك الفاصولياء الاعتيادي الأكثر وجوداً في العينات المختبرة في كلا المنطقتين وفي كلا الموسمين، وبلغت نسبته في العينات المختبرة 80.87%، تلاه فيروس موزاييك واصفرار الفاصولياء (61.73%)، ثم فيروس موزاييك الفصّة/البرسيم الحجازي (20.58%). كما لم تتفاعل 35 عينة (12.6% من العينات المفحوصة) مع أي من مصل من الأمصال الثلاثة المستخدمة في هذه الدراسة. أتضح في هذه الدراسة أن هذه أول مرة يتم فيها تعريف فيروس موزاييك واصفرار الفاصولياء على محصول الفول في كلا المنطقتين، والأولى بالمملكة التي يتم فيها تسجيل إصابة محصول الفول بفيروس موزاييك الفصّة/البرسيم الحجازي، وأول تسجيل لفيروس موزاييك الفاصولياء الاعتيادي على الفول في منطقة القصيم.

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فيروسات جديدة مسببة للإصفرار والتقرم للمحاصيل البقولية الغذائية الشتوية في سورية. صفاء قمري، خالد مكوك، نوران عطار، نادر أسعد، رنا الجلاّد ومحمد الخلف، مختبر الفيروسات، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org

تعد الفيروسات المسببة للإصفرار والتقرم من الفيروسات المهمة التي تصيب المحاصيل البقولية الغذائية الشتوية في سورية، وأدت في بعض السنوات إلى اخفاق المحصول بصورة تامة. بينت المسوحات الحقلية الأخيرة التي أجريت في معظم مناطق زراعة الفول والحمص في سورية، بأن هناك على الأقل 6-8 فيروسات تسبب تلك الأعراض ممثلة بالتفاف الأوراق، واصفرار وتقرم نباتات المحاصيل البقولية الغذائية الشتوية. ويعتبر تحديد الفيروسات النباتية في منطقة ما أمراً ضرورياً جداً لانتخاب أصناف مقاومة وإدارة المحصول. ويتطلب ذلك طرائق جيدة ذات فاعلية عالية لتحديد الفيروسات المتواجدة ودراسة الاختلافات فيما بينها ومتابعة نسب إصاباتها وانتشارها. وللوصول إلى هذه الغاية فقد تم في سورية فحص عدد كبير من العينات التي تبدي أعراض الإصفرار والتقرم خلال موسمي 2004/2005 و 2006/2005 بواسطة (أ) الإختبارات السيرولوجية/المصلية (بصمة النسيج النباتي، TBIA) باستخدام عدد من الأمصال المضادة وحيدة وعديدة الكلون و (ب) تفاعل المتسلسل للبوليمراز (PCR) باستخدام عدد من البادئات المتخصصة بالكشف عن الفيروسات التابعة لعائلة *Luteoviridae* و *Nanoviridae*. أظهرت النتائج أن الفيروسات المسببة للإصفرار للمحاصيل البقولية الغذائية الشتوية في سورية ناتجة عن الإصابة بفيروسين الحمض النووي فيهما من نوع DNA وحيد السلسلة (فيروس الاصفرار الميت للفول - FBNYV وفيروس التقرم الشاحب للحمص - CpCDV) وثلاثة فيروسات الحمض النووي فيهما من نوع RNA وحيد السلسلة (فيروس إتفاف أوراق الفول - BLRV، فيروس الإصفرار الغربي للشوندر السكري/البنجر - BWYV، وفيروس تقزم فول الصويا - SbdV). بالإضافة إلى ذلك، أظهر عدد كبير من العينات أعراض إصابة فيروسية ولكنها لم تتفاعل سواء مع الأمصال المضادة وحيدة الكلون المتخصصة أو مع البادئات المتخصصة أيضاً. وأظهرت الإختبارات اللاحقة (الإختبارات السيرولوجية، إختبارات PCR، تتالي القواعد النيتروجينية للغلاف البروتيني والنقل الحشري) أن معظم هذه النباتات مصابة بفيروسات تابعة للجنس *Poterovirus* التابع لعائلة *Luteoviridae*، والتي تنتقل بشكل أساسي بواسطة حشرات من اللوبيا (*Aphis craccivora* Koch) بالطريقة المثابرة. وتجدر الإشارة إلى أن نسبة انتشار هذه الفيروسات كان أعلى بكثير من باقي الفيروسات الأخرى المعروفة سابقاً، وبخاصة في موسم 2006/2005 في الزراعات المبكرة، وقد وصلت نسبة الإصابة بالفيروسات التابعة لجنس *Poterovirus* في بعض الحقول في منطقتي الساحل السوري والغاب إلى أعلى من 50%، وكانت إنتاجية النباتات المصابة بهذه الفيروسات كانت قليلة جداً وتكاد أن تكون معدومة. ويعتبر هذا أول تسجيل لمثل هذه الفيروسات في سورية. ويناقش البحث تقنية PCR ودراسة تتالي القواعد النيتروجينية للغلاف البروتيني بخصوص كشف وتعريف الفيروسات التابعة لعائلة *Luteoviridae*.

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مسح للأدغال/الأعشاب والحشرات المرافقة لمحصول السمسم وتقويم طرق نقل الفايوتوبلازما المسببة لمرض تورق أزهار السمسم إلى النباتات السليمة. ايداد عبد الواحد الهيتي وعدي نجم الحديثي، قسم وقاية النبات، كلية الزراعة، جامعة بغداد، أبو غريب، بغداد، العراق، البريد الإلكتروني: Udayal_hadethy@yahoo.com
بينت نتائج المسح الحقلية لمحصول السمسم في محطة الرائد (الهيئة العامة للبحوث الزراعية) وحقول كلية الزراعة - أبو غريب تعرض المحصول إلى نسب إصابة بمرض تورق الأزهار لمحصول السمسم بلغت 14 و 5%، على التوالي، خلال الموسمين 2000 و 2001. كما أظهرت نتائج المسح للأدغال/الأعشاب المرافقة لمحصول السمسم أعراض إصابة بالفايتوبلازما للعشب خناق الدجاج (*Euphorbia helioscopia*) حيث ظهرت عليه أعراض تورق الأزهار، وعشب الطرطبع (*Schanginia aegyptiacea*) الذي ظهرت عليه أعراض مكنسة الساحرة، وعشب الشوك (*Lagonychium farctum*) الذي ظهرت عليه أعراض تفلطح الساق وعشب الخس البري (*Lactuca scariola*) الذي ظهرت عليه أعراض تورق الأزهار. ومن الممكن أن تكون هذه الأعشاب/الأدغال مصدر إصابة ثانوية بمرض تورق أزهار السمسم في الحقل. كما أظهر المسح للحشرات المرافقة لمحصول السمسم وجود حشرات الذبابة البيضاء (*Bemissia tabaci* (Geun) ودودة السمسم الحانكة (*Dup*). *Antigastra oatalaunalis*) ودودة أوراق السمسم (*Cornifrons ulceratalis*. (Led)، فضلاً عن بعض أنواع النضاطات (*Orosius albicinctus*. Dis)، *Sagatella vibix*. Haupt و *Zygina hussaini*). وفي مقارنة لطرق نقل تلك الأمراض المختلفة تفوقت طريقة النقل بالتطعيم من نبات مصاب إلى آخر سليم، إذ حقق نسبة نقل 100% بعد 30 يوماً من التضعيم، أما النقل بالنضاطات فقد وجد أن النضاط *O. albicinctus* الناقل الوحيد من بين الأنواع التي تم تشخيصها واختبارها في هذه الدراسة حيث أظهرت نتائج هذا الاختبار تكشف ظهور أعراض الإصابة بتورق الأزهار على نبات السمسم في نباتات معاملة واحدة من مجموع خمسة معاملات بعد 30 يوماً من تاريخ العدوى.

V 34

دراسة تأثير الإصابة المشتركة والمنفردة بموزايك الفاصولياء الأصفر (BYMV) والفطر *Alternaria alternata* على الباقلاء/الفاصولياء. خالد محمود البرزنجي¹ ونديم أحمد رمضان². (1) قسم وقاية النبات، كلية الزراعة، جامعة صلاح الدين؛ (2) قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: saidkhalid88@yahoo.com
أظهرت نتائج المسح الحقلية في محافظتي أربيل ونيوى وجود مرض موزايك الباقلاء/الفاصولياء المتسبب عن فيروس موزايك الفاصولياء الأصفر (BYMV) *Bean yellow mosaic virus* ومرض تبقع أوراق نبات الباقلاء المتسبب عن فطر *Alternaria alternata*. شُخص الفيروس المسبب عن طريق الأعراض الخارجية والداخلية لنباتات الباقلاء/الفاصولياء المصابة والنقل الميكانيكي والمدى العائلي والخواص الفيزيائية والاختبارات المصلية (التلازن والانتشار المزدوج في الأجار وبصمة النسيج النباتي على غشاء النيتروسليلوز والأليزا) وبينت النتائج أن الفيروس المسبب هو فيروس موزايك الفاصولياء الأصفر. سبب الفيروس ظهور أجسام ضامة غير منتظمة قرب الفؤاة في خلايا بشرة الباقلاء الملقحة بالفيروس، وأن ثمانية أنواع من النباتات تعود إلى أربعة عوائل أصيبت بالفيروس وكانت درجة الحرارة المميتة 60°س ونقطة التخفيف النهائية 10⁻³ ومدة التعسير في العصير الخام 3 أيام عند درجة حرارة المختبر. أدت الإصابة بفيروس موزايك الفاصولياء الأصفر والفطر *A. alternata* وبكليهما إلى انخفاض في طول النباتات المصابة وقلة في عدد الأفرع والأوراق والأزهار وعدد العقد الجذرية البكتيرية وزيادة مساحة بقع الإصابة بالفطر على الأوراق العلوية. إن الإصابة المشتركة والمنفردة سببت حدوث خفض في كمية الكلوروفيل a و b والكلية مقارنة مع النباتات السليمة وقد وصلت نسبة التثبيط إلى 15.31، 23.5 و 23.19%، على التوالي مع الفيروس و 22.7، 33.13 و 32.75%، على التوالي مع الفطر. وازدادت نسبة التثبيط في الإصابة بالفيروس والفطر معاً في المرحلة الأولى إلى 48.71، 49.73 و 48.77%، على التوالي واختلقت قيم الكلوروفيل في المعاملة معنوياً مع بقية المعاملات الأخرى. أدت الإصابة بفيروس موزايك الفاصولياء الأصفر إلى حدوث زيادة في كمية النيتروجين مقارنة مع بقية المعاملات وانخفضت الكمية في النباتات المصابة بفطر *A. alternata* وقد أعطت النباتات المصابة بالفيروس والفطر المرحلة الثانية زيادة معنوية في كمية النيتروجين مقارنة مع النباتات السليمة والمصابة بالفطر. كما أدت الإصابة بالفطر *A. alternata* إلى زيادة معنوية في كمية الكربوهيدرات مقارنة مع النباتات السليمة والمصابة بالفيروس والفطر في كلا المرحلتين ولم تسبب الإصابة بفيروس موزايك الفاصولياء الأصفر حدوث انخفاض معنوي في الكربوهيدرات. أدت الإصابة المشتركة بالفيروس والفطر وفي المرحلتين إلى انخفاض معنوي وصل إلى 4.2 و 2.7 غ/100 غ مادة جافة، على التوالي.

النووي RNA للفيريونيد. ولتأكيد النتائج السابقة، طبق اختبار RT-PCR باستخدام بادئات متخصصة. وبعد إخضاع ناتج PCR للفصل على هلام البولي الأكريلاميد وهلام الأجار كشف عن جزء من الحمض النووي بقياس 359 زوج قاعدي، وبمعاملته بأنزيم القطع Bam HI وإعادة الفصل على الهلام تم الكشف عن جزأين من الحمض النووي (بقياس 119 و 240 زوج قاعدي). بعد حقن نباتات سليمة من البطاطا/البطاطس والبندورة/الطماطم بمستخلص الحمض النووي RNA، أمكن عزل الفيريونيد من تلك النباتات بطريقة هلام البولي الأكريلاميد مؤكدة إصابة تلك النباتات بالفيريونيد. وعلى أساس أعراض الإصابة الضعيفة/الهادئة المتمثلة بتقرم خفيف وبالتفاف بسيط في الأوراق، وبدراسة RNA يمكن الاستنتاج بوجود السلالة الضعيفة/الهادئة في منطقة الدراسة والمعروفة بـ M14814. أثبتت هذه الدراسة إصابة 14 درنة من أصل 250 بالسلالة الضعيفة لفيريونيد الشكل المغزلي في درنات البطاطا/البطاطس. وهذا هو التسجيل الأول للسلالة الضعيفة لفيريونيد الشكل المغزلي في درنات البطاطا/البطاطس في محافظتي رازافي وشمال خرسان في إيران.

V 31

التحري عن فيروس البطاطا/البطاطس A و M وانتشارهما في إقليم خرسان في إيران باستخدام الطرائق المصلية والبيولوجيا الجزيئية. مريم ناغيزاد، ب. جعفرور و م. فالاهاتي راسنجير، قسم أمراض النبات، كلية الزراعة، جامعة فردوسي في مشهد، ص.ب. 91775-1163، إيران، البريد الإلكتروني: maryam_naghib2003@yahoo.com
خلال فصلي الربيع والصيف لعام 2005، جُمعت من حقول البطاطا/البطاطس في 10 مناطق في إقليم خرسان (Neishabour، Kashmar، Fariman، Bojnourd، Faroodje، Ghoochan، Shirvan، Chenaran، Mashhad و Torbat-e-heydariyeh) عينات تحمل أعراض البرقشة، الموزايك، تجعد والتفاف الأوراق. وضعت العينات في صندوق مئّج وأحضرت إلى المختبر للتشخيص والدراسات الأخرى للكشف عن فيروس البطاطا/البطاطس A و M. بالإضافة لذلك تم جمع بعض الدرنات. بعض أن قُضت الدرنات فترة السبات عند درجة الحرارة 4 °س، تم نقلها للمختبر من أجل انباتها. لغرض الكشف عن هذين الفيروسين في العينات المجموعة، استخدمت الإختبارات الحيوية، المصلية، البيولوجيا الجزيئية مثل ELISA و RT-PCR. استخلص كامل الحمض النووي RNA من العينات المصابة بطريقة الترسيب بمحلول PEG 6000، وتم تحضير cDNA باستخدام بادئات متخصصة لمنطقة الغلاف البروتيني. وبعد الفصل على هلام الأجار بتركيز 1.5%، تم الحصول على خطي توضع (Band) للحمض النووي بقياس 524 و 1100 قاعدة أزوتيه، متخصصتين بفيروس البطاطا/البطاطس M و A، على التوالي. أظهرت نتائج إختبار ELISA، عن وجود فيروس البطاطس/البطاطس M في العينات المجموعة من مناطق Kashmar، Torbat-e-heydarieh و Neishabour، في حين كشف عن فيروس البطاطس/البطاطس A في حقول منطقة Kashmar فقط. وهذا هو التسجيل الأول لإصابة البطاطا/البطاطس بفيروس PVM و PVA في إقليم خرسان في إيران.

V 32

التسجيل الأول لفيريوس البرقشة الريشية وموزايك الخيار على البطاطا الحلوة (*Ipomoea batatas*) في سورية. إنصاف عاقل¹، عماد اسماعيل² وسليم راعي². (1) مركز البحوث العلمية الزراعية باللاذقية، هيئة البحوث العلمية الزراعية بدمشق، سورية؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: ensaf_akel@hotmail.com

تم مسح 63 حقلا من البطاطا الحلوة في 12 منطقة من مناطق زراعتها الرئيسية في الساحل السوري وذلك خلال موسمي 2001/2002 و 2002/2003، جمع خلالها 1180 عينة نباتية تحمل أعراضا شبيهة بأعراض الإصابات الفيروسية كالموزايك، شفافية العروق، تحزم العروق، التبرقش، الإصفرار، تقزم وتشوه الأوراق. اختبرت العينات باختبار بصمة النسيج النباتي (TBIA) الذي يتميز بالحساسية العالية واختصار الزمن وقلّة التكلفة الاقتصادية مقارنة باختبار البصمة النقطية المناعية (DBIA) الموصى به من قبل المركز الدولي للبطاطا (CIP). أجريت الإختبارات المصلية لجميع العينات في مختبر الفيروسات التابع لمركز البحوث العلمية الزراعية في اللاذقية، سورية، باستخدام الأجسام المضادة لبعض فيروسات البطاطا الحلوة، البرقشة الريشية (SPFMV)، البرقشة الخفيفة (SPMMV)، النمش والشحوب (SPCFV)، الكمون (SwPLV)، التقزم والإصفرار (SPCSV)، كاوليمو (SPCaLV)، التلّطخ الخفيف (SPMSV)، وفيروس غير معروف في البطاطا الحلوة (C-6V) وباستخدام الأجسام المضادة لفيروس موزايك الخيار (CMV). أكدت نتائج الإختبارات السيرولوجية على إصابة محصول البطاطا الحلوة طبيعيا بفيروس البرقشة الريشية وموزايك الخيار كإصابات مفردة أو مختلطة وذلك في جميع المناطق المدروسة، وهو التسجيل الأول لهذين الفيروسين على البطاطا الحلوة في سورية مع عدم تسجيل أية إصابة في العينات المدروسة بأي من الفيروسات الأخرى المستخدمة أمثالها في الدراسة رغم امتلاكها لأعراض إصابة شبيهة بأعراض الإصابات الفيروسية.

V 28

نسبة الإصابة وانتشار الأمراض الفيروسية على البطاطا/البطاطس في لبنان وملاحظات حول الأمراض الرئيسية الأخرى. ايليا شويري¹، سهير الزمار¹، فؤاد جريجيري¹، رلى العميل¹، اديب سعد²، لوسيا حنا²، سعيد ابراهيم³، وكريستينا فريري⁴. (1) مصلحة الأبحاث العلمية الزراعية، تل العمارة، رياق، لبنان، البريد الإلكتروني: echoueiri@lari.gov.lb؛ (2) الجامعة الأميركية، بيروت، لبنان. (3) الجامعة اللبنانية، بيروت؛ (4) معهد بناكي لوقاية النبات، أثينا، اليونان. أجريت دراسة حول انتشار ستة فيروسات في المناطق الرئيسية لزراعة البطاطا في سهل البقاع اللبناني حيث تتركز زراعة البطاطا (70%) إضافة إلى تسجيل ملاحظات حقلية لأمراض فطرية، بكتيرية وديدان ثعبانية. نفذت عدة زيارات حقلية خلال عامي 2001 و 2002، وتم جمع 715 عينة من 40 حقلاً بشكل عشوائي، كما تم زيارة 25 حقلاً في العام 2005 جمعت 300 عينة من المناطق الثلاث لسهل البقاع. اتبع إختبار إليزا بالاحتواء المزدوج للفيروس بالأجسام المضادة DAS-ELISA، لتقصي الفيروسات التالية: فيروس البطاطا أ (PVA)، فيروس البطاطا إكس (PVX)، فيروس البطاطا واي (PVY)، وفيروس التفاف أوراق البطاطا (PLRV) خلال عامي 2001 و 2002 والإختبار المصلي لبصمة النسيج النباتي (DTBIA) لتقصي الفيروسات المذكورة أعلاه إضافة إلى فيروس البطاطا إم (PVM)، وفيروس البطاطا إس (PVS) خلال عام 2005. من أصل 1015 عينة تبين أن 520 عينة (51.2%) كانت مصابة بفيروس أو أكثر. وكان فيروس البطاطا واي (PVY) الأكثر انتشاراً فوجد في 78.8% من مجموع العينات المصابة للأعوام الثلاثة، تلاه فيروس البطاطا أ (PVA) بنسبة (13.4%) ثم فيروس البطاطا إكس (PVX) 10.5%، وأخيراً فيروس التفاف أوراق البطاطا (PLRV) 7.6%. وبلغت نسبة الإصابة بفيروس البطاطا إم (PVM)، وفيروس البطاطا إس (PVS)، الذين تم التقصي عليهما فقط في عام 2005، حوالي 9.6% و 3.2% من مجموع العينات المصابة لكل من الفيروسين، على التوالي. تبين أيضاً وجود عزلة PVY^{NTN} باعتماد تقنية (IC-RT-PCR) التي أدت إلى ظهور بقع حلقية نكروزية في درنات بعض الأصناف. رصدت أعراض لأمراض فطرية، بكتيرية، ونيماطودا وتم تحديد مسبباتها مخبرياً كالتالي: ممرضات فطرية: *Rhizoctonia solani*، *Verticillium dahliae*، *Fusarium sp.*، *Sclerotinia sclerotiorum*، والممرض البكتيري *Erwinia carotovora*، ونيماطودا الحويصلية *Globodera rostochiensis*. لم تسجل أمراض الحجر الصحي مثل بعض الأمراض البكتيرية كالعفن البني والعفن الحلقي.

V 29

انتقال وتوزيع فايرويد الدرنة المغزلية للبطاطا/البطاطس خلال النباتات المصابة. الطاهر أحمد أبو حليقة، سليم كرزينسكي وانا استافينشكا، طرابلس، ص.ب. 81646، ليبيا، البريد الإلكتروني: majdaldeenlove@yahoo.com تم نقل فايرويد الدرنة المغزلية للبطاطا/البطاطس من أوراق الأقحوان والبندورة/الطماطم المحقونة إلى بقية أجزاء النبات ليس قبل أربعة أيام من الحقن. وقد تم الكشف عن الفايرويد في النبات العائل تحت مكان الحقن بعد أربعة إلى خمسة أيام من الحقن، بينما وجد في النبات العائل فوق مكان الحقن بعد 5 إلى 6 أيام. وبعد أخذ العينات من الفروع تحت مكان الحقن وجد أن الفايرويد متواجد بها بفارق يوم بمقارنتها بالفروع المأخوذة من فوق مكان الحقن، مما يعني أن الفايرويد ينتقل من مكان الإصابة إلى أسفل أجزاء النبات أولاً ثم ينتقل إلى الأجزاء العلوية للنبات. كشف أيضاً عن الفايرويد في أوراق نبات الأقحوان والبندورة/الطماطم المأخوذة من العقد المختلفة بالرغم من أن الأعراض كانت أكثر شدة على الأوراق في قمة النبات العائل، إلا أن الفايرويد لم يكشف عنه في بعض العيون والبراعم من درنات البطاطس/البطاطا المصابة، الأمر الذي يبرهن على عدم حدوث توزيع الفايرويد في أنسجة النبات بالكامل. والنتائج المتحصل عليها تفيد بأن الفايرويد ينتقل خلال اللحاء.

V 30

الكشف عن سلالة ضعيفة لفايرويد الدرنة المغزلية للبطاطا/البطاطس في محافظتي رازافي وشمال خُرسان في إيران. أ. يازارلو، ب. جعفر بور وم. فالاهاتي راسنجير، قسم وقاية النبات، كلية الزراعة، جامعة فردوسي في مشهد، ص.ب. 1163-91775، إيران، البريد الإلكتروني: yazarlou771@yahoo.com

بعد فايروئيد الشكل المغزلي في درنات البطاطا/البطاطس مرض خطير يُصيب البطاطا/البطاطس مسبباً فقداً كبيراً في الإنتاج. تم أخذ درنات البطاطا/البطاطس التي تظهر الشكل المغزلي وتلك المشوهة خلال أشهر الصيف والخريف لعام 2004 للكشف عن الممرض وذلك من حقول مختلفة في محافظتي رازافي وشمال خُرسان في إيران. تم تخزين العينات عند درجة حرارة 4 °س. زرعت الدرناات في البيت الزجاجي عند بدء الإنبات وبعد اجتيازها فترة السكون الطبيعي. استخلص الحمض النووي RNA من أوراق نباتات البطاطا/البطاطس بالترسيب بمحلول PEG 600، ثم أخضع للفصل على هلام البولي الأكريلاميد (PAGE) عند درجة حرارة 60 °س وصُغ بمحلول الفضة وحُدّد خط توضع (Band) من الحمض النووي RNA للفايروئيد مقارنة بالشاهد الموجب للفايروئيد. وفي طريقة أخرى، أخضع مستخلص RND للفصل الراجع على هلام البولي الأكريلاميد (PAGE) عند درجتَي الحرارة 15 و 40 °س، ثم صبغ بمحلول الفضة وحُدّد خط توضع (Band) الحمض

V 26

تشخيص الإصابة بأهم فيروسات البطاطس/البطاطا باستخدام إختبارات اليزا والنسخ العكسي لتفاعل البلمرة المتسلسل وتهجين الحمض النووي في كل من مصر وسورية. عيد الياسط أحمد شلبي¹، أمين عامر حاج قاسم²، سحر عبد العزيز يوسف¹ وناجي أبو زيد¹. (1) قسم بحوث الفيروس والفيوتوبلازما، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجيزة، القاهرة، مصر، البريد الإلكتروني: aashalaby@link.net؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية، البريد الإلكتروني: aahkasem@scs-net.org

تصاب البطاطس/البطاطا (*Solanum tuberosum* L.) بالعديد من الأمراض الفيروسية في كل من مصر وسورية. لذلك جمعت خلال الموسمين الزراعيين 2004/2003 و 2005/2004، ظهرت عليها أعراض توجي بإصابة فيروسية (موزاييك، تبرقش، النفاف الأوراق، اصفرار وتقزم النباتات) وذلك من بعض الحقول المزروعة بأصناف مختلفة منها في كل من مصر وسورية، بهدف تحديد أهم الفيروسات التي تصيب البطاطس/البطاطا. تم الكشف عن وجود ثلاثة فيروسات هامة بطريقة إيزا المصلية (ELISA) باستخدام أمصال مضادة متخصصة، وبطريقة النسخ العكسي- لتفاعل البلمرة المتسلسل (RT-PCR) باستخدام بوائى متخصصة، وبطريقة تهجين الحمض النووي DNA Hybridization باستخدام مستخلص العصارة النباتية المصابة المدمص على أغشية النيتروسيلولوز. أكدت النتائج المتحصل عليها وجود فيروسات البطاطس/البطاطا المختبرية، وهي: *Potato virus Y*، *Potato virus X* و *Potato leaf roll virus* في أصناف كارا و دراجا المجموعة من محافظتى القليوبية والمنوفية المصرية، وفي أصناف دراجا و ايبلا المجموعة من محافظتى إلب و حلب السورية. كما أكدت ضرورة استخدام التقانات الحديثة وخاصة النسخ العكسي- لتفاعل البلمرة المتسلسل (RT-PCR) وتهجين الحمض النووي (DNA Hybridization) نظراً لدقتها العالية وحساسيتها الشديدة في تشخيص الإصابة الفيروسية وذلك في برامج إنتاج تقاوي/بذار البطاطس/البطاطا أو في برامج زراعة الأنسجة النباتية الخالية من الفيروس.

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إنتاج تقاوي البطاطس/البطاطا المعتمدة محلياً في مصر: إنتاج التقاوي الخالية من الفيروسات وغيرها من مسببات المرضية. حامد محمود مزيد¹ وأبوالعطا النادى² وأبوالعطا، قسم بحوث الفيروس والفيوتوبلازما، معهد أمراض النباتات، مركز البحوث الزراعية، ص.ب. 12619، الجيزة، مصر، البريد الإلكتروني: aeaboulata@yahoo.com، hamidmazyad@yahoo.com

تم تسجيل 12 مرضاً فيروسياً على محصول البطاطس/البطاطا في مصر، وكان أكثرها انتشاراً وتأثيراً فيروس النفاف أوراق البطاطس/البطاطا وفيروس البطاطس أكس وفيروس البطاطس واي. تم الفحص والتقييم الحقلية عن طريق الفحص الظاهري للأعراض التي تسببها الفيروسات السابقة وكذلك الأعراض التي تسببها فيروسات الدرنه المغزلية. كذلك تم الفحص للأمراض الفطرية (الندوة المبكرة والندوة المتأخرة) وأيضاً تم الفحص للأمراض البكتيرية (الساق السوداء والعفن البكتيري). لتأكيد تواجد الأمراض الفيروسية والفيروسات السابقة فقد تم إجراء التحليل المختبري لعينات من درنات البطاطا/البطاطس بواسطة الاختبارات السيرولوجية (DAS-ELISA و بصمة النسيج النباتي (TBIA)، كما تم استعمال طرائق البيولوجيا الجزيئية (تفاعل البلمرة المتسلسل وتزاوج الحامض النووي الذي تم فيه استعمال المرقمات المشعة والمرقمات غير المشعة) وذلك لزيادة كفاءة التقييم الحقلية. تم التقييم الحقلية دورياً منذ بدء الموسم بغرض التخلص أولاً بأول من النباتات المصابة حتى لا تنتقل الإصابة الفيروسية وغيرها من الإصابات إلى موسم الزراعة التالي عبر الدرنات المصابة والحاملة للإصابة. كذلك تم استعمال النباتات المنتجة عن طريق مزارع الأنسجة بغرض التخلص من الإصابة الفيروسية والإصابة المتسببة عن الفيروسات. هذا فضلاً عن استخدام طرائق إنتاج الدرنات الصغيرة لإنتاج مواد نباتية خالية من الإصابة الفيروسية. تم التقييم الحقلية وإزالة النباتات المصابة لـ 40522 فدانا من البطاطس/البطاطا في محافظات الشرقية والغربية والدقهلية والمنوفية والإسماعيلية والبحيرة والقليوبية تم التقييم الحقلية لـ 19 صنفاً من البطاطس/البطاطا هم كما يلي مع رتبة كل منهم: دايموند، نيقولا، ليدي روزيتا، اسبونت، موناليزا، مارمونا، موندبال (الرتبة A و E)، توربو، اسكويرا، دراجا، استر كى (الرتبة E)، ألفا، كارا، نياتا، بركة، بيكاسو، جاسمين، أكسنت، خاريس (الرتبة A). طبقاً لمستويات القبول واستخدام النظام السابق فقد تم رفض 18% من الحقول التي تم تقييمها وذلك لتواجد الأمراض الفيروسية وغيرها من مسببات المرضية السابق الإشارة إليها. هذا النظام قد تم تطويره مؤخراً باستعمال طرائق أرخص وأكثر دقة للكشف، هذا فضلاً عن تطوير النظم في هذا الشأن .

مناطق رئيسية في سورية (الشمالية، الوسطى، الساحلية والجنوبية). تم خلاله جمع 1797 عينة نباتية (801 فول، 570 حمص، 102 عدس، 157 بازلاء، 103 شوندرسكري/بنجر و 64 بيقية) توجي بإصابة فيروسية من 150 حقلا (51 فول، 39 حمص، 8 عدس، 18 بازلاء و 20 شوندرسكري/بنجر و 14 بيقية)، إضافة إلى ذلك تم جمع 238 عينة أعشاب تنمو مرافقة لهذه المحاصيل الحقلية وتنتمي إلى سبعة فصائل نباتية (الفصيلة البقولية Fabaceae، الفصيلة الرمرامية Chenopodiaceae، الفصيلة الحمضية Polygonaceae، الفصيلة الخشخاشية Papaveraceae، الفصيلة الصليبية Brassicaeae، الفصيلة الخيمية Apiaceae والفصيلة المركبة Asteraceae). أظهرت نتائج الإختبارات السيرولوجية (إختبار بصمة النسيج النباتي) إصابة محاصيل الحمص والبيقية والبازلاء والفول والعدس والشوندر السكري/البنجر بفيروس الإصفرار الغربي للشوندر السكري/البنجر، حيث بلغت نسبة الإصابة 0.97، 0.98، 1.5، 3.82، 4.69، 9.12% من مجمل العينات التي تم فحصها، على التوالي. تباينت أعراض الإصابة بهذا الفيروس بين الإصفرار والتقرم والإحمرار، في حين لم تكن واضحة (أعراض خفيفة) على الفول. كما وجدت فيروسات أخرى تصيب المحاصيل البقولية الغذائية وتسبب أعراضاً مشابهة لتلك الناتجة عن الإصابة بفيروس الإصفرار الغربي للشوندر السكري/البنجر، مثل فيروس النفاق أوراق الفول (BLRV) وفيروس تقزم فول الصويا (SbDV) وفيروس إصفرار وموت الفول (FBNYV) وفيروسات أخرى تتبع إلى عائلة الفيروسات المسببة للإصفرار (Luteoviridae) لم يتم تحديدها. كما تم الكشف عن فيروس الإصفرار الغربي للشوندر السكري/البنجر في 12 نوعاً نباتياً تنمو في حقول البقوليات الغذائية والشوندر السكري/البنجر أو حولها. وهذه الأنواع النباتية هي: السبانخ *L. Spinacia oleracea* (الفصيلة الرمرامية)، الشوندر الشوكي *Emex spinosa* L. (الفصيلة الحمضية)، علك الغزال *Sonchus spp.* و جنسي الاقحوان *Chrysanthemum spp.* و *Anthemis sp.* (الفصيلة المركبة)، شقائق النعمان *Papver rhoeas* L. (الفصيلة الخشخاشية)، الفصيلة *Rhaphanus raphanestrum*، الخردل البري *Sinapis arvensis* L. و الجنس *Brassica spp.* (الفصيلة الصليبية)، الحندقوق *Melilotus indicus* (L.) All. و النفل *Medicago spp.* (الفصيلة البقولية)، والكزبرة البرية *Coriandrum sp.* (الفصيلة الخيمية). ويعتبر هذا هو التسجيل الأول لإصابة تلك الأنواع العشبية طبيعياً بفيروس الإصفرار الغربي للشوندر السكري/البنجر في سورية. وتم التأكد من إصابة تلك المحاصيل البقولية والأعشاب بفيروس الإصفرار الغربي للشوندر السكري/البنجر عن طريق إعادة فحصها بتفاعل المتسلسل للبوليمراز (RT-PCR) وباستخدام بادئات متخصصة. سيناقتش هذا البحث دور تقانة تفاعل المتسلسل للبوليمراز للكشف عن فيروس الإصفرار الغربي للشوندر السكري/البنجر والفروقات ما بين العزلات المختلفة لفيروسات الإصفرار. كما سيتم عرض أنواع حشرات المن المنتشرة في سورية والقادرة على نقل فيروس الإصفرار الغربي للشوندر السكري/البنجر.

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فيروسات جديدة تصيب محصول البطاطا/البطاطس لأول مرة في سورية. أمين عامر حاج قاسم¹، خليل عبد الحليم² أم التقى غفران الرفاعي³ ومحمد قاسم¹. (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، ص.ب. 7548، حلب، سورية؛ (2) الهيئة العامة للبحوث العلمية الزراعية، دوما، سورية؛ (3) مختبرات صحة البذور، مديرية الزراعة والإصلاح الزراعي، حلب، سورية، البريد الإلكتروني: aahkasem@scs-net.org

تم القيام بمسح حقلي خلال الموسمين الزراعيين 2003/2002 و 2004/2003 لتحديد أهم الفيروسات التي تصيب البطاطا/البطاطس في سورية، جمعت خلاله 1325 عينة نباتية من البطاطا/البطاطس التي ظهرت عليها أعراضاً توجي بأنها إصابة فيروسية، مثلت 84 حقلاً من محافظات حلب وإدلب وحماه وحمص واللاذقية وطرطوس. أظهرت نتائج الإختبارات المصلية للعينات المجموعة وجود تسعة فيروسات تصيب البطاطا/البطاطس بصورة طبيعية وبنسب متفاوتة في مختلف المناطق الممسوحة. وهذه الفيروسات مرتبة حسب وجودها، هي: فيروس البطاطا/البطاطس واي (PVY)، فيروس البطاطا/البطاطس إكس (PVX)، فيروس البطاطا/البطاطس إس (PVS)، فيروس النفاق أوراق البطاطا/البطاطس (PLRV)، فيروس موزاييك الخيار (CMV)، فيروس موزاييك الفصاة (AIMV)، وفيروس البطاطا/البطاطس إم (PVM) وفيروس موزاييك أوكوبيا البطاطا/البطاطس (PAMV)، وأخيراً فيروس تقزم واصفرار البطاطا/البطاطس (PYDV). وقد تراوحت نسبة العينات المصابة بفيروس واحد وفيروسين وبثلاث فيروسات أو أكثر حوالي 12.4%، 23.8% و 39.2%، على التوالي. كما أكدت النتائج ارتفاع نسبة الإصابة الفيروسية في الموسم الثاني مقارنة مع الموسم الأول. سجلت هذه الدراسة لأول مرة في سورية عدد من الإصابات الفيروسية الجديدة على أصناف البطاطا/البطاطس المختلفة، مثل: فيروس موزاييك الخيار، وفيروس موزاييك الفصاة وفيروس موزاييك أوكوبيا البطاطا/البطاطس وفيروس تقزم واصفرار البطاطا/البطاطس.

السلسلة المكملّة والحصول على cDNA. تم تصميم بادئات متخصصة بالفيروس BtMV استخدمت مع بادئات تحوي سلسلة عشوائية عند النهاية 3' من أجل نسخ وتضخيم قطع cDNA باستخدام تقنية RT-PCR. حددت النهاية 5' من الجينوم الفيروسي بعملية النسخ العكسي للحمض النووي الفيروسي ومن ثم تم تذييل النهاية 5' من الـ cDNA باستخدام الغوانوزين المنقوص الأكسجين الثلاثي الفوسفات dGTP بوجود أنزيم الترانسفيراز Transferase. تم تضخيم السلسلة باستخدام بادئ متخصص وآخر متعدد السيتوزين C15. أدخلت كل أجزاء الـ cDNA التي تم تضخيمها إلى الناقل T، كل على حده، ليصار إلى كلونتها والحصول على تسلسل القواعد الأزوتية، وتم تحديد السلسلة النيوكليوتيدية الكاملة للحمض النووي الفيروسي. تبين أن الحمض النووي للفيروس مكون من 9592 نكليوتيد، ويحوي منطقة ترجمة واحدة ينتج عن ترجمتها بروتين متعدد مؤلف من 3085 حمض أميني. كذلك تم تعريف النهايات 5' و 3' غير القابلة للترجمة إلى بروتين وحددت بعدد من النكليوتيدات قدره 166 و 171، على التوالي. تم تعريف تسع مناطق انقسام وبالتالي عشرة بروتينات هي بالتسلسل: PI، HC-Pro، P3، 6K1، CI، 6K2، VPg، Nib، CP وهذه البروتينات تعد نموذجية لكافة أفراد جنس *Potyvirus*. تبين وجود مناطق متشابهة ونموذجية لكافة أفراد الجنس، بالمقارنة بين سلسلة البروتين لفيروس BtMV والعزلة الأمريكية لنفس الفيروس وكذلك فيروسات أخرى من جنس *Potyvirus*، بعض هذه المناطق توضع في HC-Pro، كما تبين أن البروتينات CI و Nib تحتوي أحماضاً أمينية مختلفة مقارنة بفيروسات أخرى من الجنس نفسه. أكد التحليل الوراثي إنباء BtMV إلى الجنس *Potyvirus*، وتشابهاً بنسبة 55% من حيث الأحماض الأمينية مع فيروس تبرقش الفول السوداني (PeMoV). تم تركيب النسخة الكاملة للحمض النووي الفيروسي ونقلها إلى بلاسميد يحتوي على المحفز (35S promoter) من فيروس موزايك القرنبيط (CaMV). لتحقيق ذلك قُسمت السلسلة الكاملة إلى أربع قطع متداخلة من أجل تضخيمها بواسطة RT-PCR، بعد ذلك تم توصيلها على مراحل لتكون ضمن بلاسميد واحد. وجد أن الكلون الكامل للفيروس كان معدياً وأعطى أعراض واضحة على نباتات التبغ بعد العدوى بواسطة القذف الجزيني. تعدّ النسخة الكاملة والمعدية للفيروس أداة لدراسة تضاعف الفيروس كما تسهم بفهم أكبر للبيولوجيا الجزيئية لجنس *Potyvirus*.

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الكشف عن فيروس الشوندر المحمول في التربة والنمط (A) لفيروس اصفرار وموت عروق الشوندر السكري/البنجر في إقليم رازافي خراسان في إيران باستخدام اختبار RT-PCR وبادئات متخصصة. سارة غاروني، فاطمة تاباسينزاد، بهروز جعفرپور، مهروك فلهاي راسنجار، قسم أمراض النبات، كلية الزراعة، جامعة فردوسي في مشهد، ص.ب. 91775-1163، إيران، البريد الإلكتروني: saragharoni@yahoo.com، fatemeh_tabasinezhad@yahoo.com ينتمي فيروس الشوندر المحمول في التربة إلى جنس *Pomovirus*، وفيروس اصفرار وموت عروق الشوندر السكري/البنجر إلى جنس *Benyvirus*. جسيمات كلا الفيروسين عسوية الشكل وتحتوي على الحمض النووي RNA وحيد السلسلة، وتعتبر من أهم الفيروسات التي تصيب الشوندر السكري وتنتقل بواسطة فطر *Polymyxa betae Keskin* المحمول في التربة مثابراً فيها لعدة سنوات. يشابه فيروسي الشوندر المحمول في التربة واصفرار وموت عروق الشوندر السكري/البنجر من الناحية المورفولوجية ولكنهما يختلفان من الناحية السيرولوجية. يمتلك فيروس اصفرار وموت عروق الشوندر السكري/البنجر ثلاثة أنماط من النوع A، B و P. تم التحري عن هذين الفيروسين في محافظة رازافي خراسان خلال فصلي الصيف والخريف لعام 2005، وذلك بجمع عينات تحمل أعراض إصابة شبيهة بالأعراض الفيروسية من حقول شوندر مختلفة في المحافظة، ومن ثم فحصها سيرولوجياً باختباري TAS-ELISA و DAS-ELISA. أُستخلص كامل الحمض النووي RNA من جذور النباتات المصابة بالفيروس بطريقة الترسيب بمحلول PEG، وتمّ تحضير cDNA باستخدام بادئات Hexamer العشوائية. وطبق اختبار PCR باستخدام بادئات متخصصة بالفيروسات المدروسة، وبعد الفصل على هلام جاروس تركيز 1.5%، كُشف عن خط توضع (Band) للحمض النووي قياس 399 قاعدة أزوتية لفيروس الشوندر المحمول في التربة و 324 قاعدة أزوتية لفيروس اصفرار وموت عروق الشوندر/السكري.

V 24

انتشار فيروس الإصفرار الغربي للشوندر السكري/البنجر في سورية. نادر أسعد¹، صفاء قمر²، أمين حاج قاسم³، راجيندر سينغ مالهورتر² وصلاح الشعبي⁴. (1) الهيئة العامة للبحوث العلمية الزراعية، الغاب، سورية؛ (2) ايكاردا، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.kumari@cgiar.org؛ (3) كلية الزراعة، جامعة حلب، سورية؛ (4) الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية.

تم إجراء مسح حقلي خلال الموسم الزراعي 2006/2005 لتقصي المدى العائلي وانتشار فيروس الإصفرار الغربي للشوندر السكري/البنجر (*Beet western yellow virus*) (BWYV، جنس *Polerovirus*، عائلة *Luteoviridae*) في أربع

L. pimpinellifolium و *L. hirsutum* وأصناف محلية مقاومة متفاوتة باختلاف العزلات الفيروسية المحلية المختبرة، كذلك اختلفت مقاومة الأصناف تجاه العدوى الطبيعية في الظروف الحقلية. ويمكن التوصية بزراعة بعضها في المناطق الموبوءة بالفيروسات في سورية. لوحظ انتشار الذبابة البيضاء في البيوت البلاستيكية والتربس في الحقول المسموحة. يقترح البحث التوسع بالدراسة ليشمل مناطق أخرى وتشخيص فيروسات محتمل وجودها والعمل على برنامج تربية لمقاومة فيروسات البندورة/الطماطم. هذا أول تسجيل لفيروسات البندورة/الطماطم في سورية.

V 20

تشخيص فيروس اصفرار البنجر/الشوندر السكري وتنقيته وتحضير مصله المضاد في محافظة نينوى، العراق. نبيل عزيز قاسم وأناهد وعد الله دحام، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: dr_nabel2@yahoo.com

أظهر المسح الحقلية لحقول البنجر/الشوندر السكري في محافظة نينوى لموسم 2002/2001 وجود فيروس اصفرار البنجر/الشوندر السكري، وبلغت نسبة الإصابة بالاصفرار في العروة الصيفية 6.40% وفي العروة الخريفية 14.3%. وتم تشخيص الفيروس المسبب اعتماداً على الأعراض الظاهرة على النباتات الكاشفة (مثل البنجر/الشوندر السكري والسلق والاسبيناغ وغيرها) والتي اعدت ميكانيكياً من عصير محضر من العينات التي جلبت من الحقول. ودعم التشخيص بنجاح نقل الفيروس تجريبياً بواسطة حشرات من الخوخ الأخضر، وبلغت كفاءة النقل 100%. وبينت نتائج بقاء الفيروس في أوراق البنجر/الشوندر السكري المجففة والمجمدة، بقاؤه فعالاً لمدة سنة فيما حافظ على فاعليته في العصير المجمد بين 3-6 أشهر. وأظهرت دراسة الأغصان/الأعشاب الحاملة للفيروس والمرافقة لمحصول البنجر/الشوندر السكري، وجوده طبيعياً في أدغال/أعشاب الميدان والرغيلة وأذن الصخلة وعرف الديك وعنيد الذيب، ولعبت هذه الأعشاب دوراً مهماً في حفظ الفيروس. أمكن تنقية الفيروس بتقنية الترشيح الهلامي باستعمال عمود من مادة السيرادست وهي تقانة تستعمل لأول مرة في تنقية هذا الفيروس، وقد بلغت نقاوته 1.67 (نسبة 280/260)، وبلغ تركيزه في العصير النباتي 0.66 مغ/مل وأثبت الإختبار الحيوي وجود الفيروس فعالاً في المحلول النقي. وتم تحضير المصل المضاد للفيروس باستخدام الأرنب صنف البايانو الذي حقن بالمستحضر الفيروسي النقي المخروط مع الشب، واختبرت فاعلية المصل المضاد المحضر وثبت نجاحه بإختباري الانتشار المزوج في الأجار والتبذ على الشريحة الزجاجية.

V 21

بعض الأعشاب كعائل مناوب لفيروس الشوندر المنقول بالترية (BSBV) وفيروس نكرزة واصفرار عروق الشوندر (BNYVV) وللناقل *Polymyxa betae*. أحمد محمد مهنا¹، كريكور لانكن²، إيكارت شلوسير². (1) كلية الزراعة، جامعة حلب، سورية؛ (2) معهد الأمراض النباتية وعلم الحيوان التطبيقي، جامعة يوستوس ليبغ، شارع هاينرش بوف 26-32، 35392 غيسن، ألمانيا، البريد الإلكتروني: AhmadMouhanna@gmx.net

تم إختبار عدد من الأنواع العشبية (أحادية وثنائية الفلقة) لمعرفة دورها كعائل مناوب لكل من فيروس الشوندر المنقول بالترية *Beet soil borne virus* (BSBV) وفيروس نكرزة واصفرار عروق الشوندر *Beet necrotic yellow vein virus* (BNYVV) وللناقل *P. betae* وذلك بزراعتها في تربة موبوءة. بينت النتائج قدرة بعض الأنواع العشبية أحادية الفلقة *Alopecurus myosuroides*، *Lolium multiflorum*، *Sorghum vulgare*، *Sorghum halepense* وثنائية الفلقة *Galinsorga*، *Convolvulus arvensis*، *Centaurea cyanus*، *Capsella bursa-pastoris*، *Calystegia sepium*، *Stellaria media*، *Matricaria inodora*، *parviflora* في لعب دور العائل المناوب لكلا الفيروسين BSBV و BNYVV والناقل *P. betae*، بينما كان النوع *Chenopodium album* عائلاً للناقل *P. betae* وليس للفيروسين. وتم التأكد من دور هذه الأعشاب كعائل مناوب بإعادة نقل الفيروسين والناقل من جذورها إلى نباتات الشوندر السكري الحساسة. وأثبت تحليل تسلسل النكليوتيدات للحمض النووي التكميلي cDNA للناقل وإختبار البصمة الشمالي Northern Blot أن الفطر الناقل الذي استطاع نقل الفيروسين من جذور الأعشاب هو *P. betae* وليس *P. graminis*.

V 22

التوصيف الجزيئي لفيروس موزايك الشوندر السكري (BtMV). هناء حسن¹ وادغر مايز². (1) الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: hanaa70@maktoob.com؛ (2) قسم الأمراض الفيروسية (تقانات حيوية)، معهد أمراض ووقاية النبات جامعة هانوفر، ألمانيا، البريد الإلكتروني: maiss@ipp.uni-hannover.de

تم استخلاص الحمض النووي RNA لفيروس موزايك الشوندر السكري/البنجر (جنس *Potyvirus*، عائلة *Potyviridae*) من نباتات تبغ مصابة بالفيروس بهدف توصيفه على المستوى الجزيئي. واستخدم الحمض النووي في نسخ

الحقلية مقارنة بالعزلات الموجودة في مناطق أخرى من السودان وبنك الجينات، أثبتت الدراسة أن العزلات تابعة لفيروس تجعد أوراق الطماطم/البندورة الموجودة في السودان واليمن.

V 18

مرض تجعد أوراق الطماطم/البندورة مصحوبا بفيروس توامي شبيه بفيروس تجعد أوراق الطماطم/البندورة من منطقة الجزيرة في السودان، وفيروسات توامية لم تسجل من قبل على اللوبياء، والفلفل الحار من اليمن. عبد الله ناشر¹، علي أريس²، وجوديث ك. براون². (1) قسم وقاية النبات، كلية الزراعة، جامعة صنعاء، ص.ب: 13609 (مكتب بريد معين)، اليمن، البريد الإلكتروني: abd_nasher@yahoo.co.in؛ (2) قسم علوم النبات، جامعة أريزونا، توسان، الولايات المتحدة الأمريكية، البريد الإلكتروني: jbrown@ag.arizona.edu

أعراض تجعد الأوراق المصاحبة غالبا للإصابة بالفيروسات التوامية (*Begomovirus* عائلة *Geminiviridae*) شوهدت في حقول نباتات الخضر في كل من سهل تهامة، وتعز، ومنطقة جبر (صنعاء) باليمن. لوحظت أعراض الإصابة منتشرة على نباتات الطماطم/البندورة في المناطق الثلاث وبنسبة إصابة بلغت حوالي 40% على النباتات المزروعة بالبذرة مباشرة في الحقل بعد أربعين يوما من الزراعة، وبلغت الإصابة 100% بعد 60 يوما. شوهدت أعراض مشابهة للإصابة بالفيروسات التوامية على نباتات اللوبياء أيضا في كل من تهامة ومزرعة كلية الزراعة بجامعة صنعاء، وعلى نباتات الفلفل الحار في منطقة تهامة. تم جمع عينات ورقية من نباتات اللوبياء (4 عينات) والفلفل الحار (عينتين)، والطماطم/البندورة (6 عينات) من كل موقع من المواقع. ثم تم استخلاص إجمالي DNA من العينات باستخدام ما يعرف بـ 'N' Amp Extract (Sigma, St. Louis MO USA)، ومن ثم أخضعت المستخلصات للتضاعف بواسطة تفاعل السلسلة المبلمرة (PCR) باستخدام بادئات Core Cp primers، والتي تضاعف معظم إن لم يكن كل أنواع الفيروسات التوامية. تم الحصول على الحجم المتوقع للمنتج (حوالي 576 زوج قاعدي) من أربع عينات من أصل ستة عينات. تم مضاعفة القطعة المستهدفة، ومن ثم خضعت لتحديد تسلسل القواعد النيروجينية sequencing عليها. عند مقارنة القطعة المضاعفة core Cp sequences من عينات الطماطم/البندورة اليمنية مع أنواع الفيروسات التوامية المدروسة سابقا والمتوفرة في بنك الجينات الوراثية، أظهرت النتائج أن تسلسل القواعد النيروجينية للقطعة يشترك بحوال 97% مع تسلسل القواعد النيروجينية للفيروس الذي تم عزله سابقا من على نباتات التبغ من اليمن [AF070926]، وبنفس النسبة مع ما يعرف بـ *Tomato leaf curl* [AY044137] *Sudan virus-Gezira*، يلي ذلك الفيروس المعروف بـ [AY044139] *ToLCSV-Shambat* وبنسبة 96%. كذلك تم أيضا إخضاع العينات للتضاعف بالطريقة المعروفة بـ Rolling circle amplification (RCA) حيث تم تصميم منتج الـ RCA بواسطة الأنزيمات *EcoR I*، *Nco I*، *Sal I* و *Sst I*، ثم تم استنساخ حجم القطعة الكاملة المتوقعة (حوالي 2.7 كيلو زوج قاعدي) بواسطة pGEM7Zf+ أو pGEM5Zf+، ثم أخضعت القطعة الكاملة لجينوم الفيروس لتحليل تسلسل القواعد النيروجينية عليها. النتائج المتحصل عليها سيتم مناقشتها مرتبطة مع الفيروسات التوامية القريبة منها والمدروسة سابقا.

V 19

دراسة حول الأمراض الفيروسية على البندورة/الطماطم في جنوب سورية، وغريلة مقاومة الأصناف للإصابة الفيروسية. هدى قواص، قسم وقاية النبات، كلية الزراعة، جامعة دمشق، سورية، البريد الإلكتروني: houdakawas@yahoo.com
نصاب البندورة/الطماطم عالميا بأكثر من 30 فيروسا تتبع 16 عائلة مختلفة تصنيفيا. تمت دراسة الفيروسات التي تصيب البندورة/الطماطم بصورة أكثر ترددا والتي تؤدي إلى خسائر هامة في الحقول والبيوت البلاستيكية خلال المواسم الزراعية 1998-2003 في جنوب سورية. ودرس الانتقال الميكانيكي والانتقال الحشري بواسطة الذبابة البيضاء (*Bemisia tabaci*) ومنّ الدراق الأخضر (*Myzus persicae*) والتربس (*Thrips tabaci*) والمدى العائلي والأعراض التقريبية على النباتات الدالة والانتقال البذري. فحصت 1200 عينة حقلية أبدت أعراض نموذجية للإصابة بالفيروسات بواسطة اختبار الإدمصاص المناعي المرتبط بالانزيم (ELISA) تجاه 11 مصلا مختلفا. كما اختبر تفاعل 26 صنفا لتقدير مقاومتها تجاه عزلات فيروسية محلية جمعت من البندورة/الطماطم لفيروس موزايك الفصّة، فيروس موزايك الخيار، فيروس البطاطا/البطاطس Y، فيروس موزايك التبغ، فيروس الثقاف واصفرار أوراق البندورة/الطماطم وفيروس ذبول وتبقع البندورة/الطماطم، بواسطة الإعداء الميكانيكي والانتقال الحشري بواسطة الذبابة البيضاء ومنّ الدراق الأخضر والتربس ضمن ظروف الحاضنة، كما اختبرت مقاومة الأصناف ضمن ظروف الحقل خلال مواسم 1999-2002 بالاعتماد على نسبة عقد الثمار حجم ولون الثمار والإنتاج واختبرت الإصابة مصليا. أظهرت نتائج المسح الحقلية إلى أن الإصابة أدت إلى خفض الإنتاج بنسبة 25-62% باختلاف الحقول، وتراوحت نسبة الإصابة بالفيروسات وفقا للأعراض الظاهرية 12-85%. وكان متوسط الانتقال البذري بين الأصناف المختبرة 17%. أبدت أصناف بندورة/طماطم تنتمي لـ *Lycopersicon peruvianum*

V 15

الكشف عن بعض الفيروسات المسببة لأمراض تتخر ثمار الطماطم/البندورة وتقدير نسبة انتشارها في العراق. رنا جلال شاكر¹، مثنى عكيدي المعاضيدي² ورفيق عاكف العاني³. (1) تكريت، العراق؛ (2) الهيئة العامة لوقاية المزروعات، أبو غريب، بغداد، العراق، البريد الإلكتروني: mothna2003@yahoo.com؛ (3) كلية الزراعة، جامعة بغداد، أبو غريب، بغداد، العراق.

تعد ظاهرة تتخر ثمار الطماطم/البندورة من المشاكل المرضية المهمة التي تؤدي في كثير من الحالات إلى رداءة الحاصل وعدم صلاحيته للإستهلاك. انتشرت هذه الظاهرة في العراق بشكل واسع خلال موسمي 1998 و 1999 في نمط الزراعة المحمية. اخضعت هذه الحالة المرضية للدراسة خلال موسمي 2000 و 2001، اعتمدت فيها دراسة الأعراض على نباتات الطماطم/البندورة والعوائل المشخصة ومدى العوائل، فضلاً عن الإختبار المصلي السيرولوجي اليزا (ELISA) وإختبار الترسيب على الشريحة الزجاجية. بينت النتائج وجود حالتين لتتخر الثمار ناتجة عن الإصابة بثلاثة فيروسات: الأولى تسببها إحدى سلالات من فيروس موزاييك الفصه/الجث (*Alfafa mosaic virus*) والثانية ناتجة عن تداخل الإصابة المشتركة بفيروس موزاييك التبغ (*Tobacco mosaic virus*) وفيروس البطاطا/البطاطس اكس (*Potato virus X*). كما بينت دراسة حصر مسببات تتخر ثمار الطماطم/البندورة الفيروسية أن نسبة الإنتشار كانت أكثر نسبياً في نمط الزراعة المحمية (البيوت الزجاجية والبلاستيكية)، إذ تراوحت ما بين 6.4-10.8% في حين تراوحت ما بين 5.6-5.8% في نمط الزراعة المكشوفة.

V 16

حصر وتعريف فيروس اصفرار وتجعد أوراق الطماطم/البندورة في المنطقة الغربية من ليبيا. محمد علي زايد، جبر عبد الله خليل ومحمد عبد المجيد شقرون، قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، ليبيا، البريد الإلكتروني: mohrem2002@yahoo.co.uk

تهدف هذه الدراسة إلى حصر وتعريف فيروس اصفرار وتجعد أوراق الطماطم/البندورة بالمنطقة الغربية من ليبيا. تم مسح 60 صوبة/فيئة بلاستيكية موزعة على 21 موقعاً خلال ثلاثة مواسم للزراعة الخريفية (2001/2002، 2002/2003 و 2003/2004). جمعت خلال المسح 60 عينة من نباتات الطماطم/البندورة تحمل أعراض اصفرار وتجعد الأوراق وجففت بواسطة ملح كلوريد الكالسيوم الالمانى. تفاعلت جميع العينات ايجابيا في إختبار اليزا غير المباشر (DAS-ELISA) مع المصل المضاد لفيروس اصفرار وتجعد أوراق الطماطم/البندورة (*Tomato yellow leaf curl virus*). وأثبتت إختبارات المجهر الإلكتروني والخصائص المورفولوجية والسيرولوجية على وجود فيروس اصفرار وتجعد أوراق الطماطم/البندورة في عينة ورقية من نبات طماطم/بندورة مصابة. أمكن تنقية الفيروس والحصول على جسيماته في صورة حزمة تكونت في منتصف الإنبوب باستعمال تدرج من السكر، وتم التأكد من وجود الفيروس بالحزمة بواسطة إختبار اليزا. وعند دراسة الشكل الظاهري بواسطة المجهر الإلكتروني تبين أن جسيمات الفيروس كروية الشكل وتوأمية وقطر الجسيمة الفيروسية الواحدة 21 نانومترا، وطول الجسيمتين مع بعضهما 28 نانومترا.

V 17

دراسة فيروس تجعد أوراق البندورة/الطماطم في السودان. سناء مختار¹، أحمد هاشم² وميشيل بيترشيمت³. (1) قسم وقاية النبات، جامعة كردوفان، السودان؛ (2) قسم وقاية النبات، جامعة الخرطوم، السودان؛ (3) مختبر الفيروسات، CIRAD، مونيبييه، فرنسا، البريد الإلكتروني: sanamukhtar@hotmail.com

يعد فيروس تجعد أوراق الطماطم/البندورة (*Tomato leaf curl virus*) (TYLCV)، جنس *Begomovirus*، عائلة *Geminiviridae* من أهم الأمراض الفيروسية التي تصيب محصول البندورة/الطماطم في السودان، وينتقل هذا الفيروس بواسطة الذبابة البيضاء. أجريت دراسة حقلية في منطقة بارا خلال الموسمين 2002/2003 و 2003/2004 للتعرف على بعض أصناف الطماطم/البندورة المقاومة لفيروس تجعد أوراق الطماطم/البندورة. في كلا الموسمين، كان للصنف تأثير كبير في نسبة انتشار الإصابة وشدة المرض ($p < 0.001$). حيث أعطى الصنف "استرين ب" أعلى نسبة إصابة وشدة مرض تلاه الصنف "بيتو 86"، في حين أعطت الأصناف "عبد الله" و "الله كريم" نسبة إصابة وشدة مرض قليلة، والأصناف "CLN21126B" و "امدرمان" أقل نسبة إصابة وشدة مرض. في موسم 2002/2003، سجلت أعلى إنتاجية من الثمار القابلة للتسويق بواسطة الصنف "بيتو 86" تلاه الصنف "امدرمان" (7.7 طن/هكتار) ثم الصنف "عبد الله" (7.3 طن/هكتار). بينما سجلت أعلى إنتاجية من الثمار القابلة للتسويق في الموسم 2003/2004 في الصنف "امدرمان" (7.5 طن/هكتار)، وأعطى الصنف "استرين ب" أقل إنتاجية من الثمار القابلة للتسويق (2.9 طن/هكتار). أجريت دراسات مخبرية في مختبر الفيروسات بالمركز الدولي للتعاون في البحوث الزراعية للتنمية (CIRAD) بفرنسا للتعرف على عزلات الفيروس في منطقة الدراسة

الخشيب الأسود فهو مرض مستوطن في مناطق زراعة الكروم في أوروبا وحوض المتوسط ولكنه غير وبائي نظراً لأن ناقله المتعدد العوائل *Hyalesthes obsoletus* يتغذى استثنائياً على كروم العنب. وقد تم تقدير التنوع الوراثي للمرضيين FDP و BNP من إيطاليا باستخدام تحليل PCR-RFLP و SSCP. وتم جمع عينات من العنب مصابة بالمرضيين من مناطق في شمال غرب إيطاليا عامي 2004 و 2005، كما تم أيضاً اختبار أفراد موجبة من الناقل *H. obsoletus* وأعشاب برية. وأظهر تحليل PCR-RFLP لـ 165 RNA الريبوزومي (16SrRNA)، *secY* والبروتين الريبوزومي لمورثات *rp* أنماطاً توافق الأنماط القياسية C و D من فيتوبلازما الاصفرار الذهبي، وكان النمط C أكثر سيادة. ووجد نمط ثالث من فيتوبلازما الاصفرار الذهبي عامي 2004 و 2005 يختلف عن النمطين القياسيين وأظهر تحليل PCR-RFLP لمورث *tuf* من شجيرات العنب المصابة بمرض الخشب الأسود وكذلك من الحشرات نمطين يوافقان النمطين القياسيين VK-I و VK-II موجودين فقط في الأخشاب المصابة. وأظهر تحليل SSCP لعزلات الخشب الأسود أربعة بروفيلات ثابتة وقابلة للإنتاج ومعلومات تتالي أكثر مما أعطاها RFLP. كما تم تقدير المسافة بين أكثر عزلات فيتوبلازما الاصفرار الذهبي وفيتوبلازما الخشب الأسود الممثلة بدراسة تتالي المورث 16SrRNA.

V 13

التوصيف الجزيئي للفيروس الرابع المرافق لإلتفاف أوراق العنب. فراس طلس¹، بي. سلدريلي² وجي. بي. مارتيلي².
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إن السلالات المختلفة المعروفة للفيروس الرابع المرافق لإلتفاف أوراق العنب (GLRaV-4) هي: Y252، Y253، DD85 و LR106. وهناك اقتراح بأن السلالة Y253 هي فيروس جديد (GLRaV-10)، وذلك اعتماداً على الاختلاف المصلي الذي أظهرته هذه السلالة مقارنة بالسلالة النمطية الأمريكية LR106، بالإضافة إلى بعض الاختلافات في تسلسل الحمض النووي للمجين الوراثي. في محاولة لسلسلة مورثة الغلاف البروتيني (CP)، تم استعمال زوج من البادئات المتخصصة في طرف 3 وفي منتصف مورث الغلاف البروتيني، صممت بناءً على تسلسل النيوكليوتيدات في سلالة LR106. وبالمقارنة مع السلالات Y252 و LR106 وجد تطابق تام في التسلسل، مما دفعنا لمعرفة التسلسل المتبقي من مورث الغلاف البروتيني. عند استعمال لاثنين من البادئات، إحداهما في منتصف الغلاف البروتيني والأخرى في نهاية المورثة الأكثر قرباً من المورث P55. تبين بالنتيجة أن الاختلافات بين العزلات السابقة متركرة قرب الطرف 5 من مورث الغلاف البروتيني. باستعمال برنامج تحليل تسلسل الأحماض الأمينية (Peptidestructure UW-GCG package) في كل من Y253 و LR106، تبين أن القدرة الكامنة لتوليد الضد في أول 20 حمض أميني أعلى بكثير في LR106 منها في Y253، مما يفسر الاختلاف المصلي بين السلالتين. بالتالي فإن الاختلافات بين السلالات المدروسة في التسلسل الجزيئي في المورثة HSP70 ومورثة الغلاف البروتيني غير كاف لدعم الاقتراح بأن السلالة Y253 هي فيروس جديد.

V 14

وصف سلالات فيروس تبقع وذبول البندورة/الطماطم التي تصيب محصول الفول السوداني في الولايات الجنوبية الغربية من الولايات المتحدة الأمريكية. محمد بن علي الصالح¹ وكيلي شنولت². (1) قسم وقاية النبات، كلية علوم الأغذية والزراعة، جامعة الملك سعود، ص.ب. 2460، الرياض 11452، المملكة العربية السعودية، البريد الإلكتروني: malsaleh@ksu.edu.sa؛ (2) وزارة الزراعة الأمريكية، ستلوتون، 74075 ولاية أوكلاهوما، الولايات المتحدة الأمريكية.

يعتبر فيروس تبقع وذبول البندورة/الطماطم (*Tomato spotted wilt virus*) من أهم الفيروسات التي تصيب محصول الفول السوداني ويحد من إنتاجه في الولايات التي يزرع بها هذا المحصول في الولايات المتحدة الأمريكية. ونظراً لندرة الدراسات المتعلقة بسلالات هذا الفيروس في الولايات الجنوبية الغربية من الولايات المتحدة الأمريكية فإن هذه الدراسة تهدف إلى تعريف سلالات الفيروس المصاحبة لهذا المحصول عن طريق جمع عينات من النباتات المشتبه بإصابتها والتي تظهر الأعراض الشبيهة بالأعراض المرضية عليها. تم تعريف الفيروس مصلياً في العينات وكذلك تفاعل كل عينة مع العديد من النباتات المشخصة عن طريق العدوى الميكانيكية. من كل عينة تم استخلاص الحمض النووي الريبوزي وكذلك الحمض الريبوزي المنزوع الأوكسجين المتم له عن طريق الإستساخ العكسي بواسطة جهاز البلمرة (RT-PCR) المتسلسل. بواسطة التقنية السابقة تم مضاعفة الجينين قيد الدراسة N و NSm. تم دراسة تعاقب النيوكليوتيدات للجين NSm لإثبات عشرة عزلة من الفيروس، ولخمس عزلات فيروسية للجين الأخرى. تم مقارنة ذلك مع العزلات الأخرى للفيروس سواء المحلية منها أو العالمية. وجد أن العزلات المدروسة شكلت تجمعا متقاربا بالمقارنة مع السلالات الأخرى.

V 10

إزالة كل من فيروس التفاف أوراق العنب والورقة المروحية من شجيرات العنب المصابة باستخدام تقنيات زراعة القمة الميرستيمية. سحر عبد العزيز يوسف¹، محمد مرشد الظاهر² وعبد الباسط أحمد شلبي¹. (1) قسم بحوث الفيروس والفيوتوبلازما، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجزيرة، مصر، البريد الإلكتروني: aashalaby@link.net (2) قسم البساتين، هيئة البحوث العلمية الزراعية، دمشق، سورية.

يسبب كل من فيروس التفاف أوراق العنب السلالة 1 (*GRLRaV-1*) وفيروس الورقة المروحية (*GFLV*) مشاكل مرضية في شجيرات العنب خاصة على الصنف طومسون سيدلس. وتم توصيف الأعراض على العينات التي تم تجميعها من مناطق مختلفة حيث تأخذ الأوراق شكلاً غير طبيعي وتكون أكثر سمكاً مقارنة بالأوراق السليمة وهشه إلى جانب وجود اصفرار على حوافها مع التفافها إلى الأسفل. وأكدت نتائج الفحص للعينات المصابة باستخدام إختبار الـ ELISA وجود فيروس التفاف أوراق العنب السلالة 1 بها، ولوحظ أيضاً وجود مجموعه أخرى من الأعراض على شجيرات نفس الصنف حيث ظهرت الأوراق المصابة مشوهة مع حدوث تجمع للعروق الرئيسية للورق مما أعطاهما شكل المروحة. ويصاحب هذا العرض أحياناً وجود موزاييك مع اصفرار العروق وأحياناً يحدث تحزم للعروق، وأكدت النتائج وجود فيروس الورقة المروحية في العينات المصابة. تم تأكيد وجود الإصابة بكلتا الفيروسين باستخدام تفاعل الإستنساخ العكسي مع تفاعل البلمرة المتسلسل (RT-PCR)، وذلك باستخدام بوادئ متخصصة لكلا الفيروسين. وقد ساعدت تقنية زراعة الأنسجة النباتية في التخلص من الإصابة الفيروسية، حيث تم إنتاج نباتات عنب خالية من هذين الفيروسين بعد ستة أشهر عن طريق زراعة القمة الميرستيمية للنباتات المصابة على بيئة مغذية خاصة للنباتات الخشبية مزودة ببنديل أمينوبيورين واندول بيوترك أسيد للحصول على نموات خضرية، ولاحقاً تكوين جذور انبثاقات وقيل تقسية نباتات العنب ونقلها للصوبة الزجاجية تم التأكد من عدم وجود أى من الفيروسين اعتماداً على تفاعل البلمرة المتسلسل مع البادئ المتخصصة مما يؤكد أن الشتلات الناتجة خالية تماماً من الفيروسين موضع الدراسة.

V 11

تقييم أولي للحالة الصحية لأشجار الكرمة في سورية. ثريا مسلمانية¹، ميكيلي ديجارو²، توفيق البعينو² وجوفاني مارتيلي³، (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: thuraya@scs-net.org؛ (2) مختبر أبحاث الفيروسات، قسم وقاية النبات، المعهد الزراعي المتوسطي، باري، فالانزانو، إيطاليا؛ (3) قسم أبحاث الفيروسات، جامعة باري، إيطاليا.

تم خلال المسح الحقلّي للأمراض الفيروسية على أشجار الكرمة في سورية تفصي انتشار أعراض التفاف الأوراق، وظاهرة عدم التوافق وتنقر الخشب والورقة المروحية في المناطق الرئيسية لزراعة الكرمة. وقد تم عزل الفيروسات التالية: GVA، ArMV و GFLV على النباتات العشبية الدالة بواسطة العدوى الميكانيكية، وأعراض تماوت العروق وموزاييك العروق على النباتات الخشبية الدالة بواسطة التطعيم. أظهر إختبار إيلزا لـ 736 عينة جمعت من حقول المزارعين إصابتها بفيروسات المختبرة بنسبة (70.7%). وكان الفيروس GVA الأكثر تردداً (54%)، تلاه في الأهمية (GRLRaV-3)، (GFLV)، (GRLRaV-1)، بينما كانت فيروسات GVB، ArMV، GFLV و GVB أقل انتشاراً. بلغت أعلى نسبة إصابة في محافظة السويداء في جنوب سورية (77.8%)، وكان صنف الحلواني أكثرها حساسية (90%). بينما كانت إصابة الأصول في المشاتل أقل نسبياً (25%)، وكان الفيروس GFKV (22%) أكثرها تردداً. وأظهرت الإختبارات الجزيئية باستخدام بادئ متخصص إلى انتشار GRSPaV (72%) بصورة واسعة وترافق تواجده مع أعراض تماوت العروق على النبات الدال 110. أظهرت نتائج إختبار 72 عينة كان تفاعلها سلبي في إختبار إيلزا للفيروسات GRLRaV-1، GRLRaV-2 و GRLRaV-3 باستخدام تقنية RT-PCR باستخدام degenerate primer خاص بالكشف عن عائلة *Closterovirida* وجود أنواع أخرى من مجموعة *Closteroviridae* تصيب أشجار العنب في سورية. كذلك أظهرت نتائج RT-PCR وجود مجموعات أخرى من فيروسات *Nepovirus* مختلفة عن التي تم تحديدها في الإختبارات المصلية عند استخدام degenerate primer.

V 12

توصيف لفيوتوبلازما مرافقة لمرض الاصفرار الذهبي والخشب الأسود في كرمة العنب من المناطق الشمالية الغربية في إيطاليا. دايفيد باسيفيكو¹، ألبرتو ألما² وكريستينا مارشازي¹. (1) معهد الفيروسات النباتية، CNR، سترادا ديل كاكّا تورينو، إيطاليا، البريد الإلكتروني: c.marzachi@ivv.cnr.it؛ (2) قسم الحشرات جامعة تورينو، إيطاليا.

يعد مرض اصفرار كرمة العنب عاملاً محدداً خطيراً في مناطق الزراعة التقليدية للعب في أوروبا وإيطاليا. وتسبب مرضي "الاصفرار الذهبي" و"الخشب الأسود" فيوتوبلازما (FDP و BNP) تتبع لمجموعات تصنيفية مختلفة. وقد حدث وباء شديد بمرض الاصفرار الذهبي في السنوات الأخيرة في شمال إيطاليا بسبب الكثافة العالية للناقل *Scaphoideus titanus*. أما

العقل بعد رفقها بالمعاملة الحرارية. وتمّ تبيان سلامة الشتلات النسيجية بواسطة اختبار PCR بنسبة 100%. يفترض توثيق هذه النتائج الأولية لاحقاً في مرحلة تقسية الشتلات في البيت الزجاجي بواسطة الإختبار الحيوي على شتول GF305 الدالة للتأكد من سلامتها.

V 8

الكلونة الجزيئية والتعبير الجيني للغطاء البروتيني لفيروس جدري البرقوق (عزلة العمار) في بكتيريا *E. coli*. خالد عبد الفتاح الدجج¹، محمد أحمد أبو النصر¹، هيام سامي عبد القادر² ورحاب على داود². (1) قسم الميكروبيولوجيا الزراعية، كلية الزراعة، جامعة عين شمس، شبرا، مصر؛ (2) قسم الفيروس والفيتوبلازما، معهد أمراض النبات، مركز البحوث الزراعية، ص.ب. 68 حدائق شبرا 11241 القاهرة، مصر، البريد الإلكتروني: drdougDoug@yahoo.com
يحدث فيروس جدري البرقوق المسبب لمرض الشاركا في الحلويات/الحمضيات نقصاً في المحصول خصوصاً بمنطقة العمار - محافظة القليوبية. تم عزل الفيروس من أشجار مشمش مصابة، ثم إكثاره في شتلات مشمش سليمة. صميم زوج من البادئات لبلمرة جزء من جين الغطاء البروتيني من النهاية الطرفية الأمامية (N) لجينوم الفيروس. ثم تم كلونة ناتج البلمرة في الناقل pGEM-T-Easy وتهجينه باستخدام محبس متخصص للفيروس PV-DNA معلم بـ Dig.11dUTP. وتحليل النتائج النيكلوتيدي لجين الغطاء البروتيني لعزلة الفيروس وجد أنها تتشابه بنسبة 45% مع سلالة PPV-D، وبنسبة 100% مع سلالة العمار PPV-E، وبنسبة 65% مع السلالات الأخرى للفيروس. وقد تم كلونة ناتج RT-PCR الناتج من بلمرة جزء من الأجسام المحتواه (NIB) وجين الغطاء البروتيني من الطرف الكربوكسيلي (C) باستخدام الناقل البلازميدي pQE100 والذي يشفر إلى 43 حامض أميني. بعد ذلك، تم حث الحامض النووي لإنتاج بروتين الفيروس عن طريق التعبير بواسطة 6X-His-Tagged المرتبط بجين PPV-cp في خلايا بكتيريا *E. coli* سلالة M15. وتم تأكيد الحصول على البروتين بواسطة تهجين الحامض النووي باختبار وصمة وسترن (Western blot).

V 9

حصر أولي للفيروسات التي تصيب الزيتون في سورية. عبد القادر العبد الله¹، توفيق البعينو¹، مارياسابوناري²، حسين حلاق³، ميكيلي ديجارو¹ وجوفاني باولو مارتلي². (1) المعهد الزراعي المتوسطي، ص.ب. 70010 فلينزانو، باري، إيطاليا؛ (2) قسم وقاية النبات وتطبيقات الأحياء الدقيقة، جامعة باري، باري، إيطاليا؛ (3) قسم بحوث الزيتون، الهيئة العامة للبحوث العلمية الزراعية، إدلب، سورية، البريد الإلكتروني: abdukkader76@hotmail.com
يعتبر الزيتون من أقدم الأنواع النباتية المزروعة في سورية، وهو مزروع على مساحة تزيد عن 500 ألف هكتار. ونظراً لقلّة المعلومات المتوفرة عن الحالة الصحية لمحصول الزيتون في سورية فقد تم القيام بمسح حقلي يهدف إلى تقييم تردد الأمراض الفيروسية في بساتين الزيتون في القطر. حيث أنه تم في خريف 2003 زيارة ثمانين بستاناً للزيتون موزعة في ست مناطق رئيسة لزراعة الزيتون في سورية (حلب، إدلب، اللاذقية، طرطوس، درعا وحماة). تم جمع 300 عينة زيتون ممثلة لأهم الأصناف المحلية المزروعة في القطر (الزيتي، الصوراني، الدعييلي، الخضيري، القيسي والمصعبي). وقد بينت نتائج تحليل الحمض النووي الريبي مضاعف السلسلة dsRNA أن 54 من 125 عينة (حوالي 43%) أظهرت خطوط واضحة في هلام البولي أكريلاميد بعد إخضاعها للرحلان الكهربائي. كما تم إختبار جميع العينات المجموعة بواسطة تفاعل متسلسل للبوليمراز المعكوس (RT-PCR) وذلك باستخدام بادئات متخصصة بالكشف عن الفيروسات التالية: فيروس موزاييك الأرابيس (ArMV)، فيروس إنثاف أوراق الكرز (CLRv)، فيروس موزاييك الخيار (CMV)، فيروس البقعة الحلقية الكامن على الزيتون (OLRSV)، فيروس الزيتون الكامن-1 (OLV-1)، فيروس الزيتون الكامن-2 (OLV-2)، الفيروس المرافق لاصفرار أوراق الزيتون (OLYaV) وفيروس البقعة الحلقية الكامن على الفريز (SLRSV). وقد تم الكشف عن وجود جميع هذه الفيروسات، سواء في حالات إصابة مفردة أو مختلطة، وذلك في حوالي 51% من العينات. وقد وجد أن فيروس موزاييك الخيار كان الأكثر انتشاراً، حيث بلغت نسبة الإصابة بهذا الفيروس 22.7%، يليه فيروس إنثاف أوراق الكرز CLRv (15%)، الفيروس المرافق لاصفرار أوراق الزيتون (14.3%) وفيروس البقعة الحلقية الكامن على الزيتون (11.5%). وكانت الفيروسات الأربعة الأخرى موجودة بنسب أقل. وبلغت نسبة إصابة في الصنفين المحليين الرئيسيين، الزيتي والصوراني، حوالي 47%، بينما وصلت إلى 67% في الصنف خضيري. كما تراوحت نسبة الإصابة ما بين 44% في منطقة درعا و67% في اللاذقية وحماة.

V 5

مدى حدوث ثلاثة فيروسات (ApMV، PDV و PNRSV) ونوعين من الفيروئيدات (PLMVd و HSVd) على الأشجار المثمرة ذات النواة في الشرق الجزائري. نور الدين رواق¹، عبد الهادي قشي² وأربن ميرتا³. (1) قسم العلوم الفلاحية جامعة فرحات عباس، سطيف، البريد الإلكتروني: Rouag_rn@yahoo.fr؛ (2) قسم البيولوجيا، جامعة فرحات عباس، سطيف؛ (3) المعهد الفلاحي المتوسطي، باري، إيطاليا.

درست الحالة الصحية للوزيات المثمرة ذات النواة في الجزائر من خلال العديد من الجولات الحقلية. تكمن أهمية هذه الدراسة في كونها القاعدة الأساسية لوضع برنامج توثيق/مصادقة من أجل إنتاج أشجار مثمرة خالية من الفيروسات والفيروئيدات المعروفة. يتمثل الهدف من هذا البحث في تقدير تأثير ثلاثة فيروسات تتبع (ILMV، ApMV، PDV و PNRSV) ونوعين من الفيروئيدات (PLMVd و HSVd) على اللوزيات المثمرة ذات النواة في الجزائر. جمعت العينات من حقول تجارية ومشاتل عديدة. تم جمع 454 عينة في بداية موسم النمو (ربيع 2005) من أجل الكشف عن الفيروسات بواسطة اختبار اليزا الذي أظهر تبايناً في النتائج. بلغت إصابة أشجار الكرز 62.50%، الخوخ 31.1%، المشمش 25.27%، الخمرى/الدراق 25.63%، اللوز 13.24%، و 45.53% في أنواع أخرى من اللوزيات تستعمل كأصول للأصناف. وكان فيروس البقعة الحلقية المتماوتة (PNRSV) الأكثر تردداً، فقد اكتشف في 39.06% من العينات المختبرة، ApMV في 31.25% وأخيراً PDV في 29.69%. بالنسبة للكشف عن الفيروئيدات، فقد تم اختبار 531 عينة جمعت أواخر موسم النمو (خريف، 2004)، ودرست من خلال تقانة dot blot hybridization عن طريق الطبع المباشر لمعلق الأوراق على أغشية من النيتروسيليلوز. زادت نسبة الإصابة بفيروئيد PLMVd عن 14% من مجمل العينات المختبرة من بينها 10.15% فقط على أشجار الخوخ، وبلغت نسبة الإصابة بفيروئيد HSVd 5.85%، منها 4.70% على أشجار المشمش، مع العلم أنه لأول مرة يتم الكشف عن هذا الفيروئيد بالجزائر.

V 6

دراسة مقارنة للعلاقات المصلية/السيرولوجية والمورفولوجية والجزيئية بين فيروسي *Citrus psorosis* و *Citrus ringspot*. نور الدين رواق¹، عبد الهادي قشي²، أنريكو لويوزوني³ وروبرت ميلن³. (1) قسم العلوم الفلاحية، جامعة فرحات عباس، سطيف، الجزائر، البريد الإلكتروني: Rouag_rn@yahoo.fr؛ (2) قسم البيولوجيا، جامعة فرحات عباس، سطيف، الجزائر؛ (3) معهد فيرولوجيا النبات التطبيقي، CNR, 1-10135 تورينو، إيطاليا.

اهتم هذا البحث بدراسة العلاقة بين فيروسي *Citrus psorosis* و *Citrus ringspot* من خلال الخصائص السيرولوجية/المصلية والشكلية والجزيئية لـ 14 عزلة من فيروس *Citrus psorosis* و 4 عزلات من فيروس *Citrus ringspot*، من مصادر مختلفة. تفاعل المصل الناتج عن طريق حقن فيروس *Citrus ringspot virus (CtRSV-4)* واستعماله في اختبار اليزا المباشر إيجابياً مع 11 عزلة من فيروس *Citrus psorosis* و 3 عزلات من فيروس *Citrus ringspot*، وكان هذا المصل قادراً على إعطاء نتائج إيجابية في النسيج عديم الأعراض، باستثناء عزلة واحدة (Italia1) فكانت سلبية. تطلب إنتاج مصل قادر على كشف الفيروس حتى في النسيج السليم ظاهرياً تطوير عملية تنقية الفيروس وفصله من الشوائب بدءاً بأوراق *Chenopodium quinoa* المستعملة في حفظ الفيروس وتكاثره. أعطى الفصل النهائي بواسطة السلم الكثافي طبقتين متميزتين تحتوي على أجسام فيروسية خيطية مرنة ذات أطوال مختلفة ونوعين من الأشكال. شكل خيطي دائري مفتوح قطره 3 نانومتراً، وشكل ذو خيطين مزدوجين قطره 9 نانومتراً ينتهيان بأفرع وحلقات. لوحظت هذه الأشكال مع 5 عزلات من فيروس *Citrus psorosis* ومع 3 عزلات من فيروس *Citrus ringspot*. كشف التحليل الجزيئي للبروتينات الكلية بواسطة western blot باستعمال المصل نفسه لـ 4 عزلات من فيروس *Citrus psorosis* وعزلتين من فيروس *Citrus ringspot* عن وجود بروتين ذو وزن جزيئي مساوي لـ 52 كيلو دالتون. من خلال النتائج المتحصل عليها، نجد بأنه أمامنا نفس الفيروس لكنه متعدد العزلات ومتعدد الأعراض الحقلية.

V 7

تنقية أصناف اللوز اللبناني من الفيتوبلازما باستخدام تقنيات زراعة الأنسجة. لميس شلق¹، إيليا شويري¹، أحمد البيطار¹، إيلين رزق¹، باسكال سالار²، وجوزيف بوفيه². (1) مصلحة الأبحاث العلمية الزراعية، صندوق بريد 287، زحلة، لبنان؛ (2) المركز الوطني للبحوث الزراعية، صندوق بريد 81، بوردو، فرنسا، البريد الإلكتروني: lchalak@lari.gov.lb.

تواجه زراعة اللوز في لبنان إصابات فتاكة تعود للفيتوبلازما *Candidatus phytoplasma phoenicium* الذي يتسبب بأعراض "مكنسة الساحرة" والذي يؤدي غالباً إلى الموت الكامل للأشجار المصابة بعد سنوات قليلة من ظهور الأعراض المرضية الأولى. هدفت هذه الدراسة إلى تنقية أصناف اللوز المصابة بهذا المرض، وذلك باستخدام تقنيات زراعة الأنسجة. تم تنقية صنفين محليين "حلواني" و"خشابي" من المرض وذلك عبر زراعة القمم النباتية وأيضاً عن طريق زراعة

V 3

استخدام اختبار بصمة النسيج النباتي (TBIA) في الكشف عن بعض فيروسات التفاح في العراق. مثني عكيدي المعاضيدي¹، زبير نوري سلمان² ومعاذ محيي محمود شريف³. (1) الهيئة العامة لوقاية المزروعات، أبوغريب بغداد، العراق، البريد الإلكتروني: mothna2003@yahoo.com؛ (2) الشركة العامة للبستنة والغابات، أبوغريب، بغداد، العراق؛ (3) كلية الزراعة، جامعة الأنبار، الأنبار، العراق.

تعد أشجار التفاح من محاصيل الفاكهة المهمة في العراق، وتتعرض هذه الأشجار للإصابة بالعديد من الأمراض التي تعد من العوامل المهمة والمؤثرة في النمو والإنتاج. نفذت الدراسة خلال موسمي 2001 و2002 وهدفت إلى حصر الأمراض الفيروسية السائدة على بعض أصناف التفاح الشائعة وشملت إجراء مسح لـ 23 بستاناً أخذت عشوائياً من أربعة محافظات (6 في بغداد، 5 في صلاح الدين، 5 في ديالى، و7 في الأنبار) خلال الفترة من نيسان/أبريل إلى نهاية تموز/يوليو. اعتمد اختبار بصمة النسيج النباتي (TBIA) Tissue-Blot Immuno Assay في عملية تشخيص الفيروسات، فضلاً عن الإختبار الإحيائي بدراسة الأعراض على العوائل النباتية الكاشفة. حددت نسبة الإنتشار للفيروسات موضوع البحث بإجراء الفحوصات المختبرية المصلية لـ 50-150 عينة جمعت عشوائياً و10-20 عينة تحمل أعراضاً توحى بأنها إصابة فيروسية من كل بستان. جرى الإختبار لـ 5 فيروسات معروفة على أشجار التفاح، ولثلاثة أصناف (شرابي، أحمر صيفي وأنا). أظهرت النتائج أن فيروس التبغ الورقي المصفر للتفاح (*Apple chlorotic leaf spot virus*) هو الأكثر شيوعاً يليه فيروس موزايك التفاح (*Apple mosaic virus*)، فيروس تقزم الخوخ (*Prune dwarf virus*) والتبغ الحلقي الميت للوخ (*Prunus necrotic ringspot virus*)، إذ بلغت نسبة انتشارها 7.5، 1.9، 0.6 و 0.2%، على التوالي. كان الصنف "أنا" الأكثر حساسية للإصابة بالفيروسات تلاه الصنف "شرابي" ثم الصنف "أحمر محلي"، إذ بلغت نسبة إصابتها 10.8، 6.6 و 3.0%، على التوالي. كما لوحظ وجود تفاوت في نسب الإصابة بين المحافظات التي خضعت للدراسة، وكان هناك ارتفاعاً في نسب الإصابة بفيروس التبغ الورقي المصفر للتفاح في محافظة الأنبار سيما في الصنف "أنا"، إذ بلغت 10.8%.

V 4

تقصي إنتقال فيروسات تقزم الخوخ/البرقوق والبقعة الحلقية المتماوتة للوزيات/الحلويات وموزايك التفاح في الغراس البذرية لأصول أشجار اللوزيات/الحلويات في سورية. عبد الرحمن درويش وصلاح الشعبي، الهيئة العامة للبحوث العلمية الزراعية، إدارة بحوث وقاية النبات، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: gcsarshaabi@mail.sy، adarweesh@mail2world.com

تم تقصي الإنتقال البذري لفيروسات تقزم الخوخ/البرقوق (PDV) والبقعة الحلقية المتماوتة للوزيات/الحلويات (PNRSV) وموزايك التفاح (ApMV) في 421 عينة مركبة (تتكون العينة المركبة من 10 بذور أو بادرات). جمعت هذه العينات عشوائياً من 7 مشاتل زراعية موزعة في ست محافظات سورية، وتمثل ثلاثة أطوار حياتية مختلفة لأصول اللوزيات، طور البذرة (82 عينة)، طور البادرة في مرحلة الورقة الحقيقية الرابعة (67 عينة) وطور الغرسة البذرية بعد ستة أشهر من الزراعة في أرض المشتل (272 عينة). نفذت هذه الدراسة خلال الفترة ما بين 2003 و2005 باستخدام تقانة الإحتواء المزدوج للفيروس بالأجسام المضادة (DAS-ELISA). بلغ المتوسط العام للإصابة الفيروسية في عينات الغراس البذرية المختبرة بعمر ستة أشهر 1.84% بالمقارنة مع العينات البذرية (0.63%) وفقاً لنتائج هذا البحث. وتبوء فيروس تقزم الخوخ/البرقوق المرتبة الأولى في الأهمية (1.45%). واحتل فيروس البقعة الحلقية المتماوتة للوزيات/الحلويات المرتبة الثانية (0.22%)، بينما سجلت ثلاث إصابات فقط بفيروس موزايك التفاح (0.11%). وكانت أعلى الإصابات الفيروسية قد سجلت في غراس الدراق/الوخ (3.22%)، تلاها في الأهمية غراس المحلب (2.64%)، ثم اللوز (1.28%) والمشمش (0.64%). ولم تسجل أية إصابة فيروسية في غراس الخوخ/البرقوق المختبرة. وسجلت أعلى الإصابات الفيروسية (10.58%) في البادرات التي جمعت من محافظة حلب، تلاها في الأهمية العينات التي جمعت من محافظة السويداء (2.48%)، بينما سجلت أدنى الإصابات في العينات التي جمعت من محافظتي حمص وريف دمشق (1.08 و 1.05%، على التوالي). وتعد هذه النتيجة التسجيل الأول لإنتقال فيروس تقزم الخوخ/البرقوق والبقعة الحلقية المتماوتة للوزيات/الحلويات في بذور أصول اللوزيات/الحلويات في سورية.

V 1

فيروسات أشجار التفاحيات في سورية. فايز إسماعيل¹، خلدون الجبر¹، أربين ميرتا²، محمد جمال مندو¹، إيتسام السعدون¹، محمد حسن³ وصلاح الشعبي¹. (1) الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب 113، دمشق، سورية، البريد الإلكتروني: faizismail@mail.sy؛ (2) المعهد المتوسطي الزراعي، شارع شيلي 9، 70010، فالينزانو، باري، إيطاليا؛ (3) معهد بحوث إنتاج المحاصيل، قسم الفيروسات، درونفسكا 507، 16106، براغ 6، جمهورية التشيك.

أجري مسح لتقييم الحالة الصحية لأشجار التفاحيات في سورية خلال ربيع عامي 2003 و2004 في ستة محافظات، هي: دمشق، القنيطرة والسويداء (المنطقة الجنوبية)، حمص وحماة (المنطقة الوسطى) ومحافظة اللاذقية (المنطقة الساحلية الغربية) والتي تعد المناطق الرئيسية لزراعة التفاحيات. جمعت عينات ورقية مثلت 1077 شجرة تفاح، 54 شجرة أجاص و14 شجرة سفرجل من 70 بستانا إنتاجيا وثلاثة مجمعات وراثية. فحصت جميع العينات باستخدام اختبار اليزا المباشر DAS-ELISA للكشف عن وجود الفيروسات الثلاثة التالية: فيروس التبقع الأصفر لأوراق التفاح (ACLSV)، فيروس تنلم ساق التفاح (ASGV) وفيروس موزايك التفاح (ApMV). أظهرت النتائج أن نسب الإصابة بلغت 34 و 2% في كل من التفاح والأجاص، على التوالي، أما أشجار السفرجل فكانت خالية من الفيروسات المختبرة. وكان فيروس التبقع الأصفر لأوراق التفاح سائدا على أشجار التفاح بنسبة إصابة 34%، أما نسبة الإصابة بكل من فيروس تنلم ساق التفاح وفيروس موزايك التفاح فكانت 2 و 0.2% من الأشجار المختبرة، على التوالي. وكانت أشجار الأجاص مصابة بفيروس التبقع الأصفر لأوراق التفاح فقط (2%). أجري اختبار الاستدلال الحيوي لعينات طرود تحتوي على البراعم مثلت 21 شجرة تفاح و 15 شجرة أجاص بواسطة التطعيم على النباتات الدالة الخشبية التالية: *Malus pumila* cv. Virginia Crab و Radiant بالنسبة لأشجار التفاح، و *M. pumila* cv. Virginia Crab و *Pyrus communis* cv. Nouveau Poiteau بالنسبة لأشجار الأجاص. وكانت نسب الإصابة من خلال اختبار الاستدلال الحيوي أعلى منها في حالة اختبار اليزا. وُجد فيروس تنلم ساق التفاح (ASPV) وفيروس تنلم ساق التفاح في 86 و 82% من عينات التفاح المختبرة، بينما كانت نسب إصابتهما 80 و 60% في عينات الأجاص المختبرة، على التوالي. نُفذ اختبار RT-PCR إضافي لعدد محدود من العينات، إذ أكد هذا الاختبار نسب الإصابة المرتفعة لكل من فيروسات التبقع الأصفر لأوراق التفاح، تنلم ساق التفاح، تنلم ساق التفاح وموزايك التفاح. يعد هذا البحث التقرير الأول لتسجيل الفيروسات على أشجار التفاحيات في سورية، مشيراً إلى أن الحالة الصحية لهذه الزراعة غير مرضية. ونتيجة لذلك فإنه ينصح ببرنامج توثيق وطني لإنتاج مادة إكثار صحية خالية من الأمراض الفيروسية.

V 2

التحري عن فيروس البقع الورقية الشاحبة على التفاح (ACLSV) على أشجار اللوزيات والتفاحيات في سورية. خلدون الجبر¹، عماد إسماعيل² وصلاح الشعبي¹. (1) مركز بحوث السويداء، الهيئة العامة للبحوث العلمية الزراعية، السويداء، سورية، البريد الإلكتروني: kaljebr@hotmail.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية.

أجري هذا البحث بهدف التحري عن فيروس البقع الورقية الشاحبة (*Apple chlorotic leaf spot virus* (ACLSV) على أشجار اللوزيات والتفاحيات كمرحلة أولى من أجل تعريف العزلات السورية ومقارنتها بالعزلات المعروفة للفيروس. تم جمع وفحص 1280 عينة مختلفة من أشجار اللوزيات (كرز، محلب، مشمش، خوخ، دراق ولوز) والتفاحيات (تفاح، كمثرى، سفرجل وزعرور) من بساتين الأمهات والمجمعات الوراثية وحقول المزارعين في محافظات ريف دمشق والسويداء والقنيطرة وحمص وحماة وطرطوس واللاذقية خلال شهري نيسان/أبريل وأيار/مايو من عام 2006. استخدمت الطريقة المعجلة لاختبار الاحتواء المزدوج-الادمصاص المناعي المرتبط بالإنزيم DAS-ELISA، وقد بلغت نسبة الإصابة بهذا الفيروس من إجمالي العينات المدروسة 20.4%، وقد سجل التفاح أعلى نسبة إصابة بين هذه الأنواع النباتية (41.6%)، فيما كانت أقل نسبة إصابة على الدراق البذري (2.9%)، ولم تسجل أي إصابة بالفيروس في كل من عينات المشمش والخوخ والمحلب والأجاص البذري والزعرور (304 عينات). إن كشف الإصابة بهذا الفيروس على الأجاص (14.2%) وعلى السفرجل (5.3%) وعلى التفاح البذري (38.6%) وعلى الدراق البذري (2.9%) يسجل للمرة الأولى في سورية. إن تسجيل هذا الفيروس على الأنواع البذرية يفتح المجال أمام تساؤلات عديدة حول آلية انتقال هذا الفيروس من خلال عوامل أخرى غير التطعيم.

أمراض فيروسية

virPphApsv و *virPphApgy*. وكانت المورثة *avrPtoB* هي الوحيدة التي ساعدت RW60 في استرجاع وباليته في نبات الأرابيدوبسيس (*Arabidopsis thaliana*). عند حقن RW60 مع المورثة *virPphApgy* في نبات فول الصويا لم تظهر أي أعراض ظاهرية للمرض أو أي زيادة في النمو البكتيري كما هو الحال عند حقنها بـ RW60 لوحدها، ولكن عندما حقنت النباتات بـ RW60 مع المورثة *avrPtoB* لوحظ زيادة في النمو البكتيري مقارنة مع RW60 لوحدها مما يظهر أن للمورثة *avrPtoB* دوراً في زيادة وبالية RW60، في حين تسبب حقن RW60 مع المورثة *virPphA* أو *virPphApsv* في موت الخلايا النباتية في نبات فول الصويا وإعطاء ما هو معروف بظاهرة فرط الحساسية (Hypersensitive Response).

B 18

دور الري الرذاذي في تطور مرض التبّع الزاوي على القطن ومدى فعالية التعقيم الحراري في خفض نسبة الإصابة. نبيل الأحمد بك¹، محمد موفق بيري² ومحمد أمير هلاي³. (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: gcsarprotass@mail.sy؛ (2) مركز البحوث العلمية الزراعية بحلب؛ (3) إدارة بحوث القطن، حلب، سورية.

يعد مرض التبّع الزاوي على القطن والمسبب عن البكتيريا *Xanthomonas axonopodis* pv. *malvacearum* من الأمراض المهمة التي تصيب محصول القطن في سورية. بينت نتائج هذه الدراسة أن رصد بداية أعراض المرض كانت في نهاية حزيران/يونيو - بداية تموز/يوليو حسب درجات الحرارة، وأن طريقة الري الرذاذي قد شجعت على ظهور المرض وتطوره وبفارق معنوي عن طريقة الري السطحي، في حين لم يتطور في طريقة الري بالتنقيط. وكانت نسبة الإصابة وشدتها أعلى وبفارق معنوي كبير عند الري بالرذاذ عنه في الري السطحي. وأدى الاستمرار بالري الرذاذي حتى نهاية الموسم إلى انخفاض المردود بمعدل 24.9% مقارنة مع الري بالتنقيط وإلى 18.8% عند الري بالراحة. كما بينت الدراسة أن التعقيم الحراري للبذور يؤخر ظهور المرض وخاصة عند الري بالرذاذ مما زاد المردود بنسبة 12-15% مقارنة مع الشاهد. اختلفت ردود أفعال الأصناف المختبرة على تحمل المرض تحت ظروف العدوى الاصطناعية الحقلية، ولوحظ ازدياد نسبة الإصابة بالمقارنة مع طرائق الري المختلفة وعند تطبيق حمولة مرضية كبيرة، وتبين أن السلالتين 503 و 53 أكثر تحملاً للمرض من الصنف رقة 5 في موقع الرقة، ولم تكن الفروق معنوية في موقعي حلب وادلب. وسجل أيضاً عدم نجاح العدوى في موقع الحسكة بالرغم من إعادتها بعد 20 يوماً وذلك للارتفاع المفاجئ في درجات الحرارة والتي تكون اعتيادية في تلك الأوقات من السنة حسب السجلات المناخية السنوية.

B 19

دراسة مقارنة للبروتينات المستضدة في بعض أنواع وتحت أنواع بكتيريا *Erwinia* وتحضير أمصال مضادة نوعية لها. ريم الأصيل¹، محمود أبو غرة² وسعاد العقلة³. (1) الهيئة العامة للتقانة الحيوية، دمشق، سورية، البريد الإلكتروني: reemassil@gmail.com؛ (2) كلية الزراعة، جامعة دمشق، سورية؛ (3) كلية العلوم، جامعة دمشق، سورية.

إن من المهم التمكن من الكشف المبكر عن أية إصابة أو تلوث لدرنات البطاطا/البطاطس بأنواع *Erwinia* الممرضة وبخاصة في حالة استخدام الدرنات للإكثار والزراعة. تم إنتاج أمصال مضادة تشخيصية تجاه عزلات محلية من *Erwinia carotovora carotovora*، *E.c. atroseptica* و *E. chrysanthemi* بعد أن تم توصيفها بالإختبارات الكيميائية الحيوية. كما تم عزل بروتينات مستضدة بإمكانها تفریق الأنواع وتحت الأنواع المذكورة عن بعضها وذلك بتحضير نموذج رحلان كهربائي مرجعي لتلك البروتينات المستضدة المميزة للعزلات المدروسة وتحديد أوزانها الجزيئية بعد تحضير خلاصات غشائية للبكتيريا كخطوة أولى لإنتاج أمصال وحيدة التخصص. من جهة أخرى، فقد تم إنتاج أمصالاً متعددة الكلون تجاه البكتيريا الكاملة مما يمكننا من تقييم حساسية وفاعلية الأمصال المنتجة في الكشف النوعي عن الأنواع البكتيرية المدروسة وذلك بمقارنة نتائج الطريقتين المستخدمتين لإنتاجهما، أي باستخدام البكتيريا الكاملة أو البروتينات المستضدة المميزة لكل نوع في تحضير تلك الأمصال المضادة التشخيصية.

B 12

الكشف عن البكتيريا *Pseudomonas syringae* pv. *tomato* باستخدام البادئات المتخصصة بالمورثة *hrpL* بواسطة تفاعل البلمرة المتسلسل (PCR). محمد رفعت رسمي، محمد حسن علي ومرفت مصطفى فتح الله، معهد أمراض النبات، مركز البحوث الزراعية، الجزيرة، البريد الإلكتروني: ayten999@yahoo.com

تم استخدام تفاعل البلمرة المتسلسل في كشف وتحديد البكتيريا *Pseudomonas syringae* pv. *tomato* المسببة لمرض التبقع البكتيري على أوراق وثمار البندورة/الطماطم وذلك بمضاعفة جزء DNA الخاص بتتابع المورثة *hrpL*. تم تصميم بادئات *hrpL*₁ و *hrpL*₂ على أساس مطابقتة لتتابع المورثة *hrpL* الموجودة في البكتيريا *Pseudomonas* المتوفر في بنك المورثات. قام الباحثان بتحديد قطعة بطول 631 زوج قاعدي في 8 من أصل 15 عزلة تم إختبارها من جنس *Pseudomonas* التي تتبع النمط الوراثي 1 و 2. تم تقطيع ناتج تفاعل البلمرة المتسلسل بواسطة 8 أنزيمات قطع. كانت ثلاثة من نواتج التقطيع المختلفة تابعة للنمط الوراثي 1 من النموذجان A₁ و A₂. بينما تم توصيف العزلات التابعة للنمط الوراثي 2 كنموذج B. واختلف النموذجان A₁ و A₂ في موقعين فقط. وكان موقع قطع الأنزيم *Bsp1431* عند النيكلوتيد 360، بينما كان موقع عمل الأنزيم *MseI* عند النيكلوتيدات 22-24. احتوت المجموعة A₂ على عزلات *P. syringae* pv. *tomato* فقط. وتم تحديد التتابع النيكلوتيدي للمورثة *hrpL* الخاصة بعزلات البكتيريا *P. syringae* pv. *Tomato*. وتم تصميم وإختبار مجموعتي البادئين tom₂/tom₁ و tom₃/tom₁. وكانت مصممة خصيصاً للكشف عن البكتيريا *P. syringe* pv. *tomato*. ضاعفت هذه البادئات أجزاء متوقعة، هي بطول 242 و 303 زوج قاعدي، على التوالي. ضاعف البادئ tom₂/tom₁ جزء DNA الخاص بالبكتيريا *P. syringae* pv. *tomato* فقط، بينما ضاعف البادئ tom₃/tom₁ كل العزلات المختبرة التي تتبع النمط الوراثي 1. كان التشخيص باستخدام البادئ tom₂/tom₁ ناجحاً في الكشف عن البكتيريا *P. syringae* pv. *tomato* في حالة الثمار المصابة والأوراق المعداه اصطناعياً. وكان إختبار إليزا (ELISA) وارتباط البقعة المناعي DIA الأقل حساسية في الكشف عن البكتيريا *P. syringae* pv. *tomato* حيث تتطلب النتيجة الإيجابية للطريقتين أن يكون تعداد البكتيريا حوالي 10⁵ mL⁻¹ و 10⁶ mL⁻¹، على التوالي.

B 13

تعريف البسودوموناس الممرضة للنبات باستعمال طريقة المنطق الغامض. بوحراثي الصادق¹، حرزانه داود¹، بن محمد الخير² وسعد الله¹. (1) مخبر علم الأحياء الدقيقة، كلية العلوم، قسم البيولوجيا، جامعة فرحات عباس-سطيف-الجزائر؛ (2) مخبر الأنظمة الذكية، كلية علوم المهندسين، قسم الإلكترونيك، جامعة فرحات عباس، سطيف، الجزائر، البريد الإلكتروني: sbouharati@yahoo.fr

عدة عزلات من البسودوموناس الممرضة للنبات حصل عليها من عينات أشجار الفواكه بناحية قسنطينة بالجزائر. تم تعريف العزلات وتصنيفها انطلاقاً من الإختبارات المزرعية والحيوية الكيميائية والفيسيولوجية والمرضية. نقترح في هذا البحث منظوراً جديداً لتعريف هذه البكتيريا الممرضة للنبات باستعمال طريقة المنطق الغامض. تم معالجة المعطيات بخوارزمي غامض يبني عليه برنامج غامض. تكون الإجابة بعبارة لغوية وعددية للتعرف على البكتيريا الممرضة للنبات.

B 14

الخصائص الجزيئية لبكتيريا *Pseudomonas syringae* pv. *maculicola* والأنماط الممرضة ذات العلاقة باستخدام الرحلان الكهربائي نو المجال النابض (PFGE). نوريه علي العامري¹، دون أرنولد²، جون تايلور³ وآلن فيفيان². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: na_elamri5@yahoo.com؛ (2) المركز البحثي في علوم النبات، جامعة غرب بريطانيا، مجمع فرنشي، كولدهاربور لان، برستول، المملكة المتحدة؛ (3) الدولي لبحوث البستنة، وولسبورن، وورك، المملكة المتحدة.

تعدّ طريقة الرحلان الكهربائي نو المجال النابض (PFGE) تقانة تمتاز بقدرتها العالية على معرفة وتمييز الفروقات بين مورثات أفراد النمط البكتيري الممرض الواحد وبين الأنماط البكتيرية الممرضة المتقاربة. لقد تم تحليل ودراسة الأجزاء الكبيرة المحددة للحمض النووي (DNA) بعد هضم المورث بأكمله باستخدام إنزيمات محددة نادرة القطع مثل *XbaI*، *SpeI* و *SwaI*. أظهر تحليل مظهر البصمات الوراثية لسلاطات النمط الممرض *Pseudomonas syringae* pv. *maculicola* والأنماط ذات العلاقة وجود خمس مجاميع مختلفة للنمط *P. s. pv. maculicola*، ومجموعة واحدة لكل من *P. s. pv. tomato*، *P. s. pv. coriandricola* و *P. s. pv. antirrhini*. أظهرت بعض العزلات البكتيرية الأخرى التابعة لكل من *P. s. pv. Maculicola*، *P. s. pv. tomato* و *P. s. pv. lachrymans* مظهراً فريداً مقارنة بغيرها من العزلات المختبرة في هذا البحث.

B 9

مسح كمي لبكتيريا لفحة وإلتواء أوراق وسنابل القمح والشعير *Clavibacter tritici* والفاقد في الغلة في شمال غربي سورية. مصطفى بلالر ومازن بلالر، مركز بلالر التخصصي لوقاية المزروعات، الحميدية، السيد علي، شارع قاسيون، ص. ب. 10444، حلب، سورية.

جرت في مواسم 1995، 1996 و 2004، 2005 دراسة لظاهرة لفحة وإلتواء أوراق وسنابل القمح والشعير المنتشرة في شمال غربي سورية، وبيان أهميتها الاقتصادية عن طريق التحديد الكمي لنسبة الإصابة، وتقدير الفاقد في الغلة. شملت الأعمال الحقلية 606 حقول عشوائية مزروعة بالشعير و 376 حقلا عشوائيا مزروعا بالقمح، كانت موزعة على 17 ناحية و 7 مناطق تمثل مختلف مناطق زراعة القمح والشعير الرئيسية في شمال غربي سورية. أصابت هذه الظاهرة محصولي القمح والشعير، وهي منتشرة بشكل واسع وبشدة عالية في المناطق الشمالية والشمالية الشرقية والتي تقع في منطقة الإستقرار الثانية، والمناطق الجنوبية في منطقة الإستقرار الثالثة، وهي قليلة الإنتشار، بل معدومة في المناطق الغربية من محافظة حلب. وتتركز الإصابات الرئيسية بهذه الظاهرة في مناطق عين العرب، والشيوخ، وجرابلس، ومنبج، والزربة، والحاضر، والسفيرة، والراعي، والباب. وبلغت الإصابة على محصول الشعير في هذه المناطق 10، 14، 14، 12، 14، 18، 16، 8 و 6%، على التوالي. وكانت على محصول القمح في تلك المناطق أيضا 10، 18، 14، 10، 24، 16، 28، 8 و 8%، على التوالي. كما وصل متوسط الفاقد في غلة القمح الطري (صنف شام 6) تحت ظروف العدوى الطبيعية بهذه البكتيريا ونيماطودا التثاثل *Anguina tritici* وبالإثنين معا حوالي 18.7، 38 و 56.1%، على التوالي. أما الفاقد في غلة الشعير (صنف عربي أسود) فكانت 23.4، 34 و 45%، على التوالي.

B 10

الخصائص المميزة لـ *Agrobacterium vitis* انطلاقا من عقل غير مظهرة للأعراض و احتمال إنتشار التدرن التاجي في مشاتل العنب الجزائرية. زليخة كريمي وأنيسة بنقاسمي، كلية العلوم الفلاحية والبيطرة، جامعة ساعد دحلب، البليدة 09000، الجزائر، البريد الإلكتروني: krimiz@netcourrier.com

Agrobacterium.vitis هو الكائن المسبب للتدرن التاجي. ويحدث هذا المرض أوراها ونموا مفراطا على تاج وسوق العنب. يتميز الكائن المسبب بتخصصه على عائلته، ويبقى في النسغ والنسيج الوعائي بفضل وجود وتوافر حامض الترتريك وهو المركب الذي يسمح ببقاء السلالات المنتمية للصنف الحيوي 3 لـ *A. tumefaciens*. إن وجود هذه البكتيريا في مواد الإكثار يعد كافيا لنشر المرض. قمنا في هذه الدراسة بتحليل 500 عقلة غير مظهرة للأعراض منتمية لأصناف متباينة جمعت من مشاتل مختلفة وذلك للتعرف على وجود البكتيريا. وبعد استخلاص العصارة وعزلها في وسط غذائي نوعي و غير نوعي، تم تحديد 50 سلالة تنتمي للتمط الحيوي 3 من *Agrobacterium tumefaciens*. وأظهر التحليل البيوكيميائي أنه من بين مجتمعات *A.vitis* المعزولة، 40% لها القابلية على تحطيم حمض الترتريك المضاف إلى الوسط المغذي الأساسي، في حين أن سلالات أخرى لم تستطع تحطيم المركب الحامضي. في تجارب تفاعل البلمرة المتسلسل (PCR)، أعطى الحامض النووي DNA، المستخرج من هذه السلالات يعطي إشارات تضخيم توافق قطع 246 و 730 زوج قاعدي موجودة في منطقة الشراسة لليبلاسميد T1. وأظهر التحليل الجزيئي بإستعمال مورثات *vir* أن العزلات كانت شرسة وأن مواد الإكثار غير سليمة من التدرن التاجي.

B 11

تحديد قدرة عزلات بكتيريا *Erwinia* المعزولة من محصول البطاطا/البطاطس المصاب بمرض الساق الأسود لإفراز الإنزيمات المحللة للبروتين *Protease*. أنيية يونس شريف، روضة امين الرمضاني، خولة أحمد فليح ونديم أحمد رمضان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: drsarabshamaa@yahoo.com

يتضمن البحث تقدير فاعلية إنزيم بروتييز في بكتريا *Erwinia* المعزولة من محصول البطاطا/البطاطس المصاب بمرض تعفن الساق (الساق الأسود) والذي يزيد من امراضية البكتيريا. بينت النتائج أن البكتريا *Erwinia carotovora* subsp. *atroseptica* أظهرت أعلى فاعلية للإنزيم إذ كانت الفاعلية النوعية له 0.7 وحدة/ملغ بروتين، بينما كانت 0.62 و 0.6 وحدة/ملغ للبكتريا *E. carotovora* subsp. *carotovora* و *E. carotovora* subsp. *betavascularum*، على التوالي، وكانت الفاعلية أعلى مايمكن بعد 48 و 72 ساعة من التحضين عند جميع السلالات، وأن أفضل وسط لإنتاج الإنزيم هو الوسط الأساس الذي يحتوي على البكتين.

وكذلك في مستخلص أوراق الرز من خلال العينات التي جمعت من الحقل. بالإضافة لما سبق قورن إختبار PCR الكلاسيكي أو المعتاد والحيوي (التكبير الحيوي متبوع بإختبار PCR) بالعزل على بيئة الأجار الإنتخابية فأظهر إختبار PCR الكلاسيكي والحيوي أفضلية، إذ لم يتطلب إجراء إختبار العدوى التأكديدية لإثبات تعريف المستعمرات المبدئي للبكتيريا *Xanthomonas oryzae pv. oryzae* على بيئة إنتخابية XOS والمعدلة mXOS. كانت البيئة الإنتخابية المعدلة mXOS وإختبار PCR الحيوي أكثر التقنيات المستخدمة حساسية، إذ يتطلب العزل على البيئة الإنتخابية المعدلة mXOS سبعة أيام بينما يتطلب إختبار PCR الحيوي أربعة أيام فقط. كانت تقنية PCR الحيوي أكثر حساسية من العزل على بيئة الأجار الإنتخابية التي لم يعقبها الحاجة لإجراء أي إختبارات إضافية لتأكيد التعريف.

B 7

التسجيل الأول لبكتيريا ظاهرة اللفحة *Xanthomonas sp.* التي تصيب محصول الكمون في سورية. مصطفى بللار، مركز بللار التخصصي لوقاية المزروعات، الحميدية، السيد علي، شارع قاسيون، ص.ب. 10444، حلب، سورية.
جرت في أعوام 1996، 1997 و 2001 دراسة ظاهرة مرض لفحة الكمون المنتشرة حالياً في سورية ومعرفة الكائن المسبب لها. كما هدفت إلى بيان الأهمية الإقتصادية لتلك الظاهرة عن طريق التحديد الكمي لنسبة الإصابة بالظاهرة، وتقدير الفاقد في الغلة. شملت الأعمال الحقلية أثناء فترة الحصر 340 حقلاً عشوائياً موزعة على 161 قرية تمثل مختلف مناطق زراعة الكمون الرئيسية في سورية. انتشرت ظاهرة مرض اللفحة بشكل واسع وبشدة عالية في المناطق الشمالية والشمالية الشرقية والوسطى الواقعة في منطقة الإستقرار الأولى والثانية، وكانت قليلة الإنتشار في المناطق الشمالية الغربية والجنوبية من محافظات حلب، وإدلب وحماة وحمص الواقعة في شمال ووسط سورية. تراوحت نسبة الإصابة ما بين 30-70% في المناطق المختلفة. وبلغ متوسط الفاقد في الغلة نتيجة الإصابة بالظاهرة 72، 63، 48 و 43% في محافظات إدلب وحلب وحمص وحماة، على التوالي. ظهرت بشدة على محصول الكمون المزروع في حقول المزارعين بسراقب في محافظة إدلب أعراض مرض اللفحة الورقية والزهرية وذلك خلال فصل الربيع (أذار/مارس، نيسان/أبريل) من عامي 1996 و 2001 حيث ظهرت على أوراق النباتات المصابة خطوط نصف شفافة كانت في البداية مائية طرية ما لبثت أن اصفرت ثم أصبحت بنينة اللون وتحولت إلى سوداء في النهاية. وكانت العزلات المأخوذة من الأوراق والأزهار والسوق المصابة تفرز دائماً مادة هلامية مخاطية صفراء اللون. أظهرت نتائج العزل وإختبارات القدرة الإراضية والإختبارات المزرعية، والبيوكيميائية، والمجهريّة التي أجريت على الكائن المعزول إضافة إلى تطور الأعراض الظاهرية للمرض حقلياً ومختبرياً أن الكائن الممرض هو جرثوم لبكتيريا *Xanthomonas sp.*

B 8

لفحة وإلتواء الأوراق والسنابل *Clavibacter tritici* على محصولي القمح والشعير في شمالي غربي سورية. مصطفى بللار، مركز بللار التخصصي لوقاية المزروعات، الحميدية، السيد علي، شارع قاسيون، ص.ب. 10444، حلب، سورية.
ظهرت أعراض ظاهرة لفحة وإلتواء الأوراق والسنابل بشدة على محصولي الشعير والقمح المزروعين في حقول المزارعين في منبج وجرابلس والحاضر في محافظة حلب شمال غربي سورية وذلك خلال فصل الربيع (أذار/مارس، نيسان/أبريل) في مواسم 1995، 1996 و 2004، 2005. تمثلت هذه الأعراض على السنابل بوجود إفراز بكتيري لزج أصفر اللون أدت إلى لفحة السنابل، كما ظهرت الأوراق مجددة والسنابل وحواملها ملتوية ومشوهة. ولدى جفاف الإفراز البكتيري تتكون طبقة رقيقة شبه شفافة على السنابل والأوراق العلوية للنبات. وتحمل السنابل المصابة أحياناً ثأليل صلبة عوضاً عن الحبوب، توجد فيها نيماتودا *Anguina tritici* في حالة سكون. كما يمكن للممرض أن يحدث تلك الأعراض المرضية بوجود البكتيريا لوحدها بعيداً عن تأثير ديدان النيماتودا، ولو أن شدة الإصابة في هذه الحالة تكون قليلة. تم عزل الميكروب المسبب، ودرست خصائصه العامة والشكلية (المجهريّة) والمزرعية وكذلك الخصائص الفسيولوجية والكيموحيوية. وأشارت النتائج إلى أن العزلات التي تم الحصول عليها من السنابل المصابة تتبع البكتيريا *Clavibacter tritici* (*Corynebacterium tritici* Hutch.) Burk. وكذلك ما أكده أيضاً إختبار القدرة الإراضية. أظهرت دراسة القدرة الإراضية ورد فعل بعض أصناف الشعير والقمح تحت المظلة الخشبية (الدفينة) وتحت ظروف الإعداء الإصطناعي أن أكثر أصناف الشعير قابلية للإصابة بالمرض هو صنف عربي أسود تلاه الصنفان تدمير وزنبقة، وكان الصنفان ربحان وعرطة أقلهما قابلية للإصابة، ثم تلاهما الصنف عربي أبيض. وكانت أصناف القمح الطري شام 6، وبحوث 6، أكثر الأصناف قابلية للإصابة بالمرض، وشام 4 أقل قابلية للإصابة في حين أظهرت أصناف أخرى من القمح القاسي درجات مختلفة من القابلية للإصابة وهي شام 3، شام 5 وبحوث 5.

والأعشاب/الحشائش. واشتملت العزلات على 15 عزلة من محافظة المنوفية وخمس عزلات من الغربية ولم يتم عزل المسبب المرضي من محافظة الشرقية (الصالحية) إذ أنها منطقة خالية من هذا المرض. تم إختبار القدرة الإمرضية لتلك العزلات على بادرات الطماطم/البندورة، وكانت عزلي التربة (رقم 1 و2) وعزلة البطاطس/البطاطس (رقم 8) وعزلة الماء (رقم 12) أكثر العزلات ضراوة في إحداث المرض. أوضحت نتائج تعريف العزلات العشرين السابقة أنها تتبع بكتيريا *Ralstonia solanacearum* سلالة رقم 3 طراز حيوي 2، وذلك طبقاً لخصائصها البيوكيميائية والقيسولوجية، تتميزها على بيئة كنج B وعلى بيئة SMSA، التحليل باستخدام الأجسام المضادة المعلمة فلورسنتيا، تحليل الأحماض الدهنية وعن طريق تحليل الحمض النووي DNA وذلك باستخدام جهاز البلمرة المتسلسل PCR. وقد أمكن تخزين عزلات البكتيريا السابقة لمدة وصلت إلى 3 شهور عند رقم حموضة 7 ودرجة حرارة 15 °س.

B 4

تقييم القدرة الإمرضية لعزلات مختلفة من بكتيريا الجنس *Erwinia* المسببة لمرض العفن الطري والساق السوداء وتقدير رد فعل بعض أصناف البطاطا/البطاطس تحت الظروف المختبرية. شذا نيهان¹، صلاح الشعبي¹ ومحمود أبو غرة². (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: shaza77@maktoob.com؛ (2) كلية الزراعة، جامعة دمشق، دمشق، سورية.

تم تقييم القدرة الإمرضية لـ 30 عزلة محلية تنتمي لبكتيريا *Erwinia carotovora* subsp. *atroseptica*، *E. carotovora* subsp. *Carotovora* و *E. Chrysanthemii*، وذلك بمعدل 10 عزلات لكل منها تحت ظروف المختبر خلال عام 2004 باستخدام عشر شرائح من درنات البطاطا/البطاطس من كل صنف لإختبار كل عزلة على حده، ومن عشرة أصناف مزروعة محليا. أظهرت النتائج تباينا كبيرا في الأعراض وقطر الأنسجة المتحللة الناتجة عن البكتيريا الثلاثة المختبرة. وكانت البكتيريا *E. chrysanthemii* أكثرها عدوانية، وتميزت بصورة معنوية عن تحت الأنواع الأخرى. تلاها في الأهمية البكتيريا *E. carotovora* subsp. *carotovora* التي لم تتفوق معنويا على *E. carotovora* subsp. *atroseptica*. أظهرت ست عزلات من بكتيريا *E. chrysanthemii* من أصل عشرة مختبرة قدرة إمرضية عالية وعالية جدا إزاء شرائح درنات بطاطا/بطاطس الأصناف المدروسة، وبلغ عددها 5 و 3 عزلات من العدد الأصلي ذاته في البكتيريا *E. carotovora* subsp. *carotovora* و *E. carotovora* subsp. *atroseptica*، على التوالي. تباين رد فعل شرائح درنات أصناف البطاطا/البطاطس إزاء مرض العفن الطري المتسبب عن العزلات المختلفة للبكتيريا المختبرة، وكانت الأصناف دراجا وديامونت وأنا من أكثرها مقاومة للمرض مقارنة مع الأصناف أريندا ويزيتا ونيكولا. وكان الصنف مارفونا مقاوما لعزلات البكتيريا *E. carotovora* subsp. *atroseptica* فقط، بينما كانت الأصناف ديامونت وأجريا ودراجا متوسطة القابلية للإصابة إزاء البكتيريا *E. chrysanthemii*، ولم تسجل أصناف مقاومة لها.

B 5

عزل وتوصيف عزلات متحملة للإجهادات من بكتيريا *Sinorhizobium meliloti*. فواز عبد الستار الصفور و رعد حساني سلطان، قسم علوم الحياة، كلية التربية، جامعة الموصل، العراق، البريد الإلكتروني: raadsultan@yahoo.com
تم عزل أربع وعشرين عزلة من بكتيريا *Sinorhizobium meliloti* من العقد الجذرية لنباتات الجت/الفصة التي جمعت من مناطق زراعية مختلفة من محافظة نينوى-العراق. أظهرت خمس عزلات فقط (FA7، FA8، FA10، FA11، FA12) تحملا إزاء الحامضية (pH 4.5) وملح الطعام (6%) وملح كبريتات البوتاسيوم (8%). وكانت العزلات الخمس قادرة على النمو في وسط الرايزوبيوم الأدنى. تباينت العزلات الخمس المدروسة في مقاومتها للمضادات الحيوية، وأظهرت العزلتان FA7 و FA8 كفاءة عالية في تثبيت النتروجين بالإعتماد على وزن الجزء الخضري الجاف. أظهرت دراسة الدالة الحامضية في وسط MSY السائل تغييره باتجاه الحامضية. كذلك بينت هذه الدراسة اختزال عدد وحدات تكوين المستعمرات مقارنة مع الظروف القياسي. شملت هذه الدراسة أيضا إنتاج جزيئات سطح الخلية في تلك العزلات الخمسة.

B 6

تطوير تقانات دقيقة للكشف عن بكتيريا لفحة أوراق الرز. عبد الله محمود عبد المنعم، محمد رفعت رسمي، رانيا زكي الشناوي، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، ص.ب. 12619 الجيزة، مصر، البريد الإلكتروني: dimamt@yahoo.com، dimam@link.net

أختبر تفاعل البلمرة المتسلسل PCR كطريقة نوعية للكشف عن البكتيريا *Xanthomonas oryzae* pv. *oryzae* المسببة لللفحة أوراق الرز. قورنت فاعلية وكفاءة ومدى الوثوق في إختبار PCR بإختبارات إرتباط البقعة المناعي DIA والإليزا غير المباشرة ELISA والطريقة التقليدية بالعزل على البيئات الإنتخابية في الكشف عن البكتيريا في المعلق البكتيري

B 1

مرض التدرن التاجي في الأردن. حامد خليف، قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: h-khlaif@ju.edu.jo

ينتشر مرض التدرن التاجي الذي تحدثه البكتيريا *Agrobacterium tumefaciens* في جميع مناطق زراعة الأشجار المثمرة. وفي السنوات الأخيرة لوحظ ازدياد انتشار هذا المرض بشكل متلازم مع زيادة المساحة المزروعة بالأشجار. عزل المسبب المرضي من العوائل التالية: أصول اللوزيات (اللوز المر، دراق، نكتارين، خوخ، GF677، GF305)، أصول التفاحيات (التفاح، الأجاص، السفرجل والأصل MM106)، العنب، الزيتون، الرمان، الخروب، والورد. جمعت عزلات ممرضة من المسبب المرضي من العوائل المذكورة، وعرفت بالإختبارات البيوكيميائية والفسولوجية. كما أثبتت قدرتها الإمراضية بإعداد أشتال بندورة صنف مارمندا وأشتال كلنشوة، وبالكشف عن الجين tmr بواسطة إختبار تفاعلات البلمرة المتسلسل (PCR). دلت نتائج هذه الإختبارات على أن 60.5% من هذه العزلات تتبع الطراز البيولوجي الأول (Biotype 1) الذي كان أكثر شيوعاً من الطرز البيولوجية الأخرى في الأردن إذ عزل بصفة رئيسية من اللوزيات، الزيتون، الخروب، الرمان والورد. ووجد أن 23.5% من هذه العزلات تتبع الطراز البيولوجي الثاني (Biotype 2) وتم الحصول على عزلاته من اللوزيات والتفاحيات. وكان 1% من هذه العزلات تتبع الطراز البيولوجي الثالث (Biotype 3) وتم عزله من العنب فقط. صنفت 15% من هذه العزلات على أنها تتبع طراز بيولوجي متوسط (Intermediate Biotype) كما وجد أن 77% من هذه العزلات كانت حساسة لإختبار Agrocin 84 وأن 66% من هذه العزلات الحساسة تتبع الطراز البيولوجي الأول. طبقت العدوى الاصطناعية لأصول لوزيات مختلفة شملت GF677، GF305، Mariana، Montclar، Wild apricot، Myrobolan و bitter almond، لمعرفة مدى قابليتها للإصابة بمرض التدرن التاجي، فظهر على أن جميع هذه الأصول كانت قابلة للإصابة بالمرض بدرجات مختلفة، حيث وجد أن GF677 و GF305 كانا أكثرها قابلية للإصابة مقارنة مع الأصل Myrobolan الذي كان أقلها قابلية للإصابة. أما في مجال مكافحة المرض فقد وجد أن التعقيم الشمسي كان فعالاً في خفض أعداد المسبب المرضي وكان هذا الانخفاض متناسباً مع درجة الحرارة ونوع التربة حيث أدى ذلك إلى خفض أعداد المسبب المرضي في الأسابيع الثلاثة الأولى من التعقيم بنسبة وصلت إلى 99% في غور الأردن حيث التربة القلوية ومعدل درجات حرارة تراوحت ما بين 39-51°س. كما أثر ذلك في انخفاض نسبة حدوث المرض لأشتال اللوز المر GF677 بنسبة تراوحت من 89-94%. وكان التعقيم الشمسي فعالاً في غور الأردن أكثر مما هو عليه في المرتفعات. وفي مجال مكافحة الحيوية وجد أن مستخلصات الكائنات المضادة *Bacillus subtilis*، *Penicillium sp.*، K84، K1026 و *Trichoderma harzianum* بالإضافة إلى مستخلص الثوم كانت فاعلة في تثبيط نمو المسبب المرضي في المختبر وفي خفض أو منع ظهور أورام على أشتال البندورة و GF677 سبق غمر جنورها بمعلق هذه الكائنات المضادة قبل إعدائها بمعلق المسبب المرضي.

B 2

عزل وتعريف البكتيريا المسببة لتبقع الشماري (*Arbutus pavarii* Pampanini) بمنطقة الجبل الأخضر - ليبيا. عز الدين محمد يونس العوامي، قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا، البريد الإلكتروني: Azzawami2002@yahoo.com

أظهر المسح الحقلي الذي أجري خلال 2004 و 2005 بمنطقة الجبل الأخضر في ليبيا، انتشاراً واسعاً لمرض تبقع أوراق نبات الشماري *Arbutus savarii* Pampanini الذي يعتبر فريداً من نوعه في أنحاء العالم والمنتشر في منطقة الجبل الأخضر بصورة طبيعية. أظهرت النتائج الأولية انتشار هذا المرض في عدة مواقع وبنسب إصابة مختلفة. وبعد إجراء عمليات العزل، إتضح من نتائج دراسة الخصائص العامة والشكلية والمزرعية وكذلك الفسولوجية والكيموحيوية أن العزلات التي تم الحصول عليها من الأجزاء المصابة تتبع البكتيريا *Pseudomonas syringae* pv. *syringae* وهذا ما أكدت عليه إختبارات القدرة الإمراضية.

B 3

تعريف *Ralstonia solanacearum* المعزولة من درنات البطاطس/البطاطا، الأعشاب/الحشائش، الماء والتربة في مصر. محمد رضا أحمد تهامي¹، محمود محمد محمد عطية¹، فائزة فوزي غبريال² وهناء عبد الفتاح سالم مطر². (1) قسم النبات الزراعي وأمراض النبات، كلية الزراعة، جامعة الزقازيق، مصر؛ (2) مشروع العفن البني، مركز البحوث الزراعية، الدقي، الجيزة، مصر، البريد الإلكتروني: ahmed_tohamy02@hotmail.com

يعد مرض العفن البني أو الذبول البكتيري على البطاطس/البطاطا من أهم أمراض البطاطس/البطاطا المحجور زراعياً على مستوى العالم وفي مصر. تم عزل وتعريف المسبب المرضي من مصادر مختلفة باستخدام طرق سريعة ودقيقة. أوضحت النتائج أنه من بين 200 عينة، تم عزل 20 عينة ممرضة من درنات البطاطس/البطاطا، التربة، الماء

أمراض بكتيرية

وتفوق المبيد "difenoconazole" في زيادة إنبات البذور معنوياً على نظيره "carboxin 20% + thiram 20%". وكان هذا التفوق معنوياً عند مستوى احتمال 5%، وبلغ المتوسط العام للنسبة المئوية للإنبات 94 و 92% في البذور المعاملة بمطهر البذار الأول والثاني، على التوالي مقارنة مع الشاهد 88%. ولم ينحصر تأثير المطهر "carboxin 20% + thiram 20%" في زيادة نسبة الإنبات وإنما تعداها إلى حماية المجموع الخضري وذلك بخفض شدة الإصابة معنوياً خلال فترة التأسيس التي بلغت 45 يوماً بعد الإنبات، حيث بلغت شدة الإصابة 6.25 و 5.857 للأصناف بلدي وغاب 2، على التوالي عند معاملتها بهذا المطهر مقارنة بشدة الإصابة في معاملة الشاهد غير المعاملة 7.000 و 6.625. كما أسهم تطهير البذور بالمبيد الأخير في زيادة الوزن الرطب للمجموع الخضري بفارق معنوي، وكان متوسط الوزن الرطب للمجموع الخضري للنبات الواحد 3.646 غ عند معاملة البذور بهذا المبيد مقارنة مع الشاهد 3.159 غ، أي بزيادة مقدارها 13%. وأدى رش المجموع الخضري بالمبيدين الفطريين chlorothalonil و Azoxystrobin إلى خفض شدة الإصابة وزيادة الوزن الحيوي على نحو معنوي. وكان هذا التأثير معنوياً عند مستوى احتمال 5%، وبلغت شدة الإصابة 2.563، 3.479 عند الرش مرتين بـ azoxystrobin و chlorothalonil على التوالي مقارنة مع الشدة في معاملة الشاهد 6.927. وكان متوسط الوزن الرطب للنبات الواحد 4.736 و 3.945 غ عند الرش مرتين chlorothalonil و azoxystrobin، على التوالي مقارنة بالشاهد الذي كان 2.376 غ وهذا يمثل زيادة في الوزن الحيوي قدرها 40-46%.

F 75

تحديد التنوع الوراثي بين عزلات من *F. solani* تحدث عفن الجنور في الحمص باستخدام واسمات جزيئية AFLP. ف. حسن زادة¹، م. فلاحاتي راستجار¹، ب. جعفر بور¹ وم. اسكندري². (1) قسم وقاية النبات، كلية الزراعة، جامعة فردوسي في مشهد، إيران؛ (2) قسم أمراض وأفات النبات، مركز خراسان للبحوث الزراعية والطبيعية، ص.ب. 1163-191775، إيران، البريد الإلكتروني: fatia1662@yahoo.com

تم الحصول على 67 عزلة من الفطر *F. solani* من عينات نباتية مصابة تم جمعها من مناطق زراعة الحمص الرئيسية في شمال وشرق إيران. وكانت السمات الرئيسية للفطر هو امتلاكه لفياليدات طويلة وإنتاجه لكويما كريمة وأحياناً خضراء اللون على وسط CLA. وتم حفظ العزلات في وسط SNA وزجاجات مكاراتي محتوية على رمل معقم وذلك لفترات قصيرة وطويلة، على التوالي. وأجري اختبار المقدرة المرضية لكافة العزلات، وتم استخلاص الحمض النووي DNA من 30 عزلة باستخدام واسمات AFLP جزيئية لتحديد التنوع الوراثي. وأظهرت النتائج تنوعاً وراثياً كبيراً. ولم يظهر الـ DNA العنقودي للواسمات أية علاقة للمنطقة أو العوامل المناخية. وقدمت نتائج الدراسة الحالية إنباتاً للقدرة التمييزية العالية لتحليل AFLP، كما تقدم إمكانية استخدام هذه الطريقة للتوصيف الجزيئي للفيوزاريوم.

F 76

الأمراض الفطرية للنباتات العطرية، تطورها وإدارتها. ماريا لودوفيكيا غولينو وأنجيلو جاريالدي. مركز الكفاءة والاختراع في قسم الزراعة والبيئة، جامعة تورينو، شارع ليوناردو دي فينشي 44، 10095 جروغلياسكو، إيطاليا، البريد الإلكتروني: marialodovica.gullino@unito.it

يعد إنتاج النباتات العطرية صناعة مزدهرة واسعة الانتشار ومهمة اقتصادياً في الكثير من الدول الصناعية كما في الدول النامية. ويبدو للعيان في مجال الزراعة التكرار والتغيرات السريعة في نمط المنتج، وتبني التكنولوجيا، وتغير المساحات المزروعة، وهذا يتضمن الأشجار الدائمة الخضرة والمتساقطة، والنباتات العطرية الخشبية، والشجيرات، ومحاصيل المشتل، والنباتات الخضراء، والأزهار المقطوفة، ونباتات الأوص المزهرة، ونباتات الحدائق المعتشرة، ونباتات الحدائق المزروعة في الأصص، والأعشاب المعمرة، ومواد الإكثار والعقل. وقد بلغت قيمة زراعة الزهور في الأسواق التصديرية في عام 2003 حوالي 18 بليون يورو. وحدثت خلال العقود الماضية تغييرات حقيقية، وأدخلت محاصيل ومنتجات جديدة، مثل نباتات الأصص، وحلت جزئياً محل الزهور المقطوفة، وطورت تقانات التربية ومحسنات النمو، والنباتات المعلقة، وظهرت مناطق منتجة جديدة. أثرت مثل هذه التغيرات عميقاً في تطور الأمراض وفي إدارتها. وقد تم دراسة الأسباب الرئيسية لهذا التطور وقدمت الأمثلة التطبيقية الكثيرة.

F 73

تقييم أهمية الرش بالمبيد الفطري خلال فترة حضانة الجيل الأول لمرض لفحة الأسكوكيتا على الحمص وأثر ذلك في الكتلة الحيوية والإنتاج الحبي. رولة شمسي¹، أحمد الأحمد¹، راجندر ماهوترا² ويونس ادريس³. (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية؛ (3) الهيئة العامة للاستشعار عن بعد، دمشق، سورية، البريد الإلكتروني: r.shamsi@hotmail.com

تعدّ لفحة الأسكوكيتا المتسببة عن الفطر *Ascochyta rabiei* (Pass) lab من أكثر الأمراض خطورة على الحمص في العديد من دول العالم. ويمكن أن يدمر هذا المرض المحصول عندما تكون الظروف الجوية رطبة ومائلة للبرودة خلال موسم النمو. أجريت هذه الدراسة لتقييم أهمية الرش بالمبيد خلال فترة حضانة الجيل الأول للمرض مقارنة مع مواعيد رش أخرى مختلفة لمقاومة لفحة الأسكوكيتا. دلت نتائج التجربة الحقلية التي نفذت في تل حديا، إيكاردا، 2004، على أهمية رش نباتات الحمص صنف غاب3 بالمبيد الفطري خلال فترة حضانة الجيل الأول للمرض مقارنة مع مواعيد رش أخرى مختلفة. فالرش في تلك الفترة كانت الأكثر فاعلية، إذ أدت إلى انخفاض النسبة المئوية للإصابة من 100% في المعاملات المعدة اصطناعياً (سواء عند تلك التي لم ترش بالمبيد الفطري، أو التي رشت بالمبيد في الموعد الثاني فقط أي بعد ظهور الأعراض أو الموعد الثالث فقط أي بعد عشرة أيام من ظهور الأعراض أو في الموعدين الثاني والثالث معا) إلى 16.5% عندما رشت مرة واحدة فقط (فترة حضانة المرض)، ثم انخفضت إلى 14.8% عندما رشت مرة أخرى في الموعد الثاني وإلى 11.3% عندما رشت في المواعيد الثلاثة. وأثر الرش بالمبيد في الشدة المرضية إذ أظهر هذا الصنف (غاب 3) تحملاً كبيراً للمرض إذ لم تتجاوز شدته المرضية في طور الأزهار درجة 5.17 في النباتات المعدة بدون تطبيق أي رش بالمبيد الفطري، وما بين 4.40 و 4.80 للمعاملات المعدة التي رشت بالمبيد في الموعد الثاني فقط أو الثالث فقط أو في الموعدين معا وذلك حسب سلم تقييس 1-9. وبلغت شدة المرض أقصاها في طور نضج القرون (10 حزيران/ يونيو) إذ وصلت إلى 5.70 درجة في نباتات الشاهد المعدة دون رش بالمبيد. أما المعاملات المعدة التي رشت بالمبيد في الموعد الثاني أو الثالث أو الموعدين معا فوصلت الشدة المرضية لديها إلى درجة تراوحت ما بين 5.50 و 5.70. أما عند المعاملات المعدة التي رشت بالمبيد خلال فترة حضانة المرض (الموعد الأول) فسجلت إصابات خفيفة فقط لم تتجاوز شدتها المرضية 1.43. كما تراوحت النسبة المئوية للقرون المصابة ما بين 11.3% و 23.7% للمعاملات المعدة التي لم ترش بالمبيد خلال فترة حضانة المرض، في حين كانت 0% للمعاملات المعدة التي رشت بالمبيد خلال فترة حضانة المرض. وأظهرت النتائج أن تطبيق الرش الكيميائي بالمبيد الفطري خلال فترة حضانة المرض (الموعد الأول) أعطى أفضل كتلة حيوية و غلة حبية، سواء كانت رشة واحدة أو رشتان (الموعدين الأول والثاني أو الأول والثالث) أو ثلاث رشات (المواعيد الثلاثة معا). وتراوحت الكتلة الحيوية ما بين 6408 و 6912 كغ/هـ، والغلة الحبية ما بين 3299 و 3429 كغ/هـ. وبالمقابل فإن عدم تطبيق الرش بالمبيد الفطري أو تأخير تطبيقه حتى ظهور الأعراض (الموعد الثاني) أو بعد ظهورها بعشرة أيام (الموعد الثالث) أدى إلى خفض كل من الكتلة الحيوية والغلة الحبية بنسبة 13% و 19%، على التوالي.

F 74

دور المطهرات الفطرية في الإقلال من عدد الرشوات بمبيدات الفطور لمكافحة مرض لفحة الأسكوكيتا على الحمص. بركات الرحمون¹، عبد العزيز نيان²، بسام بياعة²، محمود حسن³، زاودي بيثاو² وسهام كبابي². (1) المؤسسة العامة لإكثار البذار، فرع إدلب؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، (3) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: b_rahmon@scs-net.org

يعدّ مرض لفحة الأسكوكيتا الذي يسببه الفطر (*Ascochyta rabiei* (Pass)) أكثر الأمراض التي تصيب الحمص أهمية. تم تنفيذ تجربة في دفيئة بلاستيكية لدراسة التأثير المزدوج لمطهرات البذار الفطرية الجهازية والأصناف المتحملة في التقليل من عدد الرشوات الوقائية للحد من الإصابة بالمرض وتخفيض الخسائر التي يحدثها. بينت نتائج التجربة أن إصابة بذور الحمص بفطر أسكوكيتا تؤثر سلباً في نسبة إنباتها، وكان هذا التأثير معنوياً عند مستوى احتمال 5% في الصنف الحساس (البلدي) وفي الصنف متوسط التحمل غاب 2، ولم يكن معنوياً عند الصنف الأعلى تحملاً غاب 3. وبلغ متوسط النسبة المئوية للإنبات في البذور السليمة 97، 96 و 99% مقارنة مع نسبة الإنبات في البذور المصابة التي كانت 65، 87 و 98% للأصناف بلدي، غاب 2 و غاب 3، على التوالي؛ كما بينت النتائج زيادة معنوية في نسبة إنبات البذور المصابة وكانت هذه الزيادة معنوية عند مستوى احتمال 5% للبذور المعاملة بالمطهرين الفطريين "difenoconazole" و "carboxin 20% + thiram 20%". وبلغ متوسط النسبة المئوية للإنبات 73، 92 و 100% لبذور الصنف البلدي، غاب 2 وغاب 3 المعاملة بالمطهرات الفطرية، على التوالي مقارنة مع نسبة إنبات بذورها في معاملة الشاهد 57، 83 و 97%.

وتم الحصول على 30 عزلة من عينات نباتية مصابة وتربية تم جمعها خلال 2005 من مجمل المنطقة وعرفت إلى مستوى السلالة باستخدام أصناف فول صويا تفريقية. وتبين أن معظمها يتبع السلالة 1 التي اتسمت بشراستها على المورث Rps 7. ويعد هذا التسجيل الأول لهذه السلالة في موغان. ويؤدي استخدام نوع فول صويا جديد يمتلك المورث Rps بدلا عن Williams إلى خفض شدة المرض في موغان

F 71

التنوع في مجتمعات الفطر *Ascochyta fabae* الكائن المسبب للفحة الأسكوكيتا على الفول في سورية، وتعريف أصناف مقاومة له في الأصول المحلية السورية. بسام بياعة¹، علي صبيح²، محمود حسن³، منذر قباقجي¹، سامر مراد¹، ماثيو أبانغ¹، سهام كبابي¹ ووظفة إبراهيم². (1) المركز الدولي للبحوث الزراعية في المناطق الجافة، إيكاردا؛ (2) هيئة البحوث العلمية الزراعية، اللاذقية، سورية، البريد الإلكتروني: ali_sbeeh@hotmail.com؛ (3) كلية الزراعة، جامعة تشرين، اللاذقية، سورية.

يعد مرض لفحة الأسكوكيتا الذي يحدثه الفطر *Ascochyta fabae* من الأمراض الفطرية الرئيسية التي تصيب الفول في سورية إذ يحدث المرض خسائر محصولية كبيرة كما ونوعا. وقد اكتشف مؤخرا الطور الجنسي لهذا الفطر في سورية مشيراً لإمكانية تطويرية عالية لمجتمعات الممرض. يعد فهم التنوع في مجتمع *A. fabae* مطلباً رئيساً لتعريف مصادر مقاومة، والتي تشكل المكون الرئيس لبرنامج إدارة متكاملة للمرض. ولدراسة التنوع في مجتمعات الممرض، جمعت 181 عينة فول مصابة بالمرض من مختلف المحافظات، ودرست الاختلافات الشكلية بين العزلات. أظهرت النتائج اختلافات واضحة بين العزلات في لون المستعمرة وتنامي قطرها وكثافة التبرغ وعدد الأوعية البكنيدية في وحدة المساحة وأبعاد الأبواغ والأوعية البكنيدية. كما اختبرت القدرة الإراضية لـ 5 عزلات في دقينة بلاستيكية في إيكاردا على تسعة أصناف فول تفريقية، وقدرت الشدة المرضية على مقياس من 1-9. وتبين وجود اختلاف واضح في شراسة العزلات المختبرة حيث تراوح متوسط درجة الإصابة ما بين 2-6.3. تم تقويم أداء 50 مدخلا محليا من الفول من سورية تحت خيمة عازلة للحشرات لمقاومة المرض، وأجريت العدوى الاصطناعية بمعلق بوغي لمزيج من خمس من العزلات الشرسة، وقدرت الشدة المرضية على المقياس السابق نفسه، وأمكن تحديد مدخلين مقاومين للمرض هما BPL 1277 و BPL 2761 حيث كان متوسط درجة الإصابة فيهما أقل أو يساوي 3. ويشكل هذان المدخلان مصادر قيمة للتربية لمقاومة المرض. زرعت العزلات المنقاة بتقنية البوغ الوحيد على وسط سائل (مستخلص الفول-سكروز) وتم حفظ الميسليوم الناتج لإجراء الدراسة الجزيئية.

F 72

المقاومة المستحثة لمرض صدأ الفول باستخدام مضادات الاكسدة. متولى علي بركة¹، ناجي أبو زيد² ومحمد عبد العظيم². (1) كلية الزراعة، جامعة قناة السويس، مصر؛ (2) معهد بحوث أمراض النبات، مركز البحوث الزراعية، 9 ش جامعة القاهرة، الجيزة، مصر، البريد الإلكتروني: nagiabouzeid@link.net

يعد مرض صدأ الفول الذي يحدثه الفطر *Uromyces vicia fabae* (Pers) Schroet أهم أمراض المجموع الخضري على الفول، حيث ينتشر في مصر وفي بلدان أخرى، وهو ثاني مرض مدمر في شمال الدلتا بمصر، ويسبب نقصاً كمياً ونوعياً في المحصول. ويعد استحثاث المقاومة في النبات ضد المسببات المرضية أحد وسائل حماية البيئة كبديل أمن أو على الأقل لتقليل استخدام المبيدات الكيماوية في مكافحة أمراض النبات. تحت ظروف العدوى الاصطناعية في الصوبة بمحطة البحوث الزراعية بالجيزة في مصر، تم تقييم سبعة مواد مانعة للاكسدة لتقييم فاعليتها في استحثاث المقاومة في الفول ضد مرض الصدأ وذلك رشاً على المجموع الخضري قبل إجراء العدوى الصناعية بـ 24 ساعة. دلت النتائج على أن كل المواد المستخدمة خفضت شدة المرض معنوياً مقارنة بالشاهد. وتحت ظروف العدوى الطبيعية بمزرعة محطة البحوث الزراعية بسخا (محافظة كفر الشيخ) تم استخدام صوديوم داي سلفات وتراي صوديوم سترات كحاثين للمقاومة وكذلك المبيدين الحيويين بيو ارك وبيو زيد خلال موسمين متتاليين 2004/2003 و 2005/2004 على الصنفين سخا 3 ويوسف الصديق رشاً على المجموع الخضري، أدت كل المعاملات إلى خفض شدة الإصابة بالمرض وزيادة المحصول. وسوف يتم عرض النتائج لكل من الصوبه والحقل.

الموجودة في جسم الفطر النامي في الأطباق البيترية. أما التحليل الميكروسكوبي فأثبت السيادة الأولية للأبواغ الكونيدرية الصغيرة مقارنة مع الكونيدية الكبيرة. وبينت هذه الدراسات وجود ارتباط معنوي بين الضراوة وعرض الجراثيم الصغيرة وقطر النمو الميسيليومي للمستعمرات النامية في الأطباق البيترية. أوضحت دراسة القدرة الإمراضية أن عزلات FOL تمثل سلالة فيزيولوجية واحدة لكنها تبدي إختلافاً واضحاً على مستوى الضراوة على الأصناف الحساسة. أما عند تحليل التكامل الخضري، فقد تبين وجود ثلاثة طرز من الطفرات (nit-3، nit-M، و nit-1)، وتمثل nit-1 الطفرة الأكثر ظهوراً (63%)، تلاها nit-M (31%) ثم nit-3 (6%). وعلى أساس المقدررة على تشكيل الأنوية غير المتجانسة فإن كل عزلات FOL جمعت في مجموعة واحدة (GCV-0471) والتي يمكن اعتبارها كمؤشر على تجانس عشيرة FOL في شمال غرب الجزائر. وتبين من تحليل تباين بصمة الحامض النووي بواسطة تفاعل PCR أن هناك تباين شكلي ضعيف تم الحصول عليه من ستة بواديء التفاعل RAPD (8%) و 3 أزواج من بادئ التفاعل AFLP (93%). قدر التشابه الوراثي بين السلالات بواسطة معامل التشابه لجكارد JACCARD، والأبعاد المتحصل عليها مثلت على هيئة تعاقب هرمي، وعلى أساس بروقيل الكثافة الناتج من بادئ التفاعل RAPD و AFLP المختلطة، فإن العشيرة جمعت إلى تحت عشيرتين مع إختلاف وراثي ضعيف حتى في داخل تحت العشيرة نفسها. وعند تجميع العزلات لم يحدث أيضاً ارتباط واضح بين الأصل الجغرافي وضراوة العزلات.

F 68

توزع الأنماط التزاوجية والطور الجنسي لفطر *Ascochyta rabiei* في الجزائر. مليكة خوايجية¹، اللويزة بو عبد الله¹، زاوي بوزناد² ومحمد لعدي³. (1) مخبر الميكروبيولوجيا، قسم البيولوجيا، كلية العلوم، جامعة وهران، الثانية، الجزائر، البريد الإلكتروني: Khouaïdjia_malika@yahoo.fr؛ (2) المعهد الوطني للفلاحة، الحراش، الجزائر؛ (3) المركز الوطني للبحث الزراعي، سيدي بلعباس، الجزائر.

ينتشر الفطر المسبب لمرض لفحة أسكوكيتا الحمص (*Ascochyta rabiei*) في كل مناطق زراعة الحمص محدثاً خسائر هامة في الغلة عند توافر شروط مناخية مناسبة. يسهم الطور الكامل للفطر *Didymella rabiei* دوراً مهماً في نقل المرض إلى مسافات بعيدة، كما يسهم أيضاً في رفع نسبة التنوع الوراثي الملاحظة عند عشائر هذا الفطر. ويعد هذا التنوع أحد أسباب إخفاق العديد من برامج مكافحة المرض وبخاصة برامج إنتاج نباتات مقاومة. هدف هذا العمل إلى دراسة إنتشار المجموعات المتوافقة جنسياً. وتم إجراء تصالب ما بين النمطين التزاوجيين (Mat 1:1 و Mat 1:2) و 30 عزلة لـ *A. rabiei* جمعت من مناطق زراعية مختلفة في الجزائر. تم الحصول مخبرياً على الطور الكامل للفطر *A. rabiei* مما يؤكد وجود المجموعتين المتوافقتين (Mat 1:1 و Mat 2:1) في الجزائر. وكان انتشار المجموعتين متغيراً حسب المنطقة الجغرافية وحسب السنة التي عزلت فيها العينة.

F 69

الكشف عن فطر *Phytophthora nicotianae* من التربة باستخدام أقراص من ورق فول الصويا. أ. محمدي و أ. علي زاده، قسم أمراض النبات، جامعة تربية مدارس، طهران، إيران، البريد الإلكتروني moham_ab@modares.ac.ir تم التوصل لمعدل كشف عال لفطر *Phytophthora nicotianae* عند ترطيب تربة مجففة هوائياً، موضوعة في دوارق مخروطية من حقول فول صويا وتحضيرها لمدة أسبوعين إلى أربعة أسابيع عند درجة حرارة 25°س. وذلك بإضافة 5-10 مل ماء مقطر، ووضع طعم مؤلف من أقراص من ورق فول الصويا لمدة 12 ساعة. وتم ملاحظة الأكياس البوغية الظاهرة من حواف الأقراص الورقية المصابة باستخدام المكبرة بعد 72 ساعة من التحضين في الماء المقطر. وللحصول على عزلات نقية، تم نشر معلق أبواغ زيجية على مستنبت أجار مائي تركيزه 1.5% حاو على مضادات حيوية للبكتريا. وبعد 24 ساعة، تم عزل الأبواغ الزيجية المنبثة في مزارع نقية. وأمكن الكشف باستعمال هذه التقنية عن ست عزلات من 50 عينة تربة، وكانت جميع العزلات من النمط A2.

F 70

التسجيل الأول للسلالة 1 من الفطر *Phytophthora sojae* من مقاطعة موغان بإيران. أ. محمدي¹، أ. علي زاده¹، م. ميرابولفاتي² ون. سافيا¹. (1) قسم أمراض النبات، جامعة تربية مدارس، طهران، إيران، البريد الإلكتروني: moham_ab@modares.ac.ir؛ (2) معهد بحوث أمراض وأفات النبات، قسم أمراض النبات، إيران. يعدّ تعفن الجذور الذي يحدثه الفطر *Phytophthora sojae* مرضاً مدمراً لفول الصويا في إيران. وقد تم تعريف سلالات للفطر من مقاطعتي لورستان وغولستان، لا تتحكم بها مورثات المقاومة الشائعة في فول الصويا. هذا ولا تعرف السلالات السائدة من الفطر في مقاطعة موغان. لذا هدفت الدراسة الحالية لعزل وتعريف السلالات السائدة في هذه المقاطعة.

F 65

التعرف على الفطور المحمولة بالبذرة والمصاحبة لبعض بذور البقوليات في العراق واسلوب مكافحتها. عبد الرضا طه سرحان، قسم علوم الحياة، كلية العلوم، جامعة القادسية، الديوانية، العراق، البريد الإلكتروني: artsarhan@yahoo.com
أجريت دراسة مختبرية لتعريف الفطور المحمولة على البذور والتي تؤثر في إنبات بذور وموت بادرات عدد من المحاصيل البقولية في الديوانية بالعراق وهي: الفاصولياء، الباقلاء/القول، اللوبياء، الحمص، الماش/الحمص أخضر، العدس والبرسيم/البازلاء. فحصت عينات من البذور المختلفة بالطرق المعتمدة كالتحسين على ورق النشاف وبيئات الأجار، وقد ثبت أن جميع البذور المفحوصة كانت حاملة لعدد من الفطور. تضمنت الفطور التي سجلت على بذور البقوليات بعد فترة تحضين لمدة أسبوع واحد أنواعا من الأجناس التالية: *Chaetomium*, *Botrytis*, *Ascochyta*, *Aspergillus*, *Alternaria*, *Rhizoctonia*, *Penicillium*, *Macrophomina*, *Geotrichum*, *Fusarium*, *Drechslera*, *Cladosporium* و *Stemphylium* و *Verticillium*. تم حساب النسبة المئوية للبذور المصابة ونسبة الإنبات لكل عينة من البذور وأظهرت النتائج وجود اختلافات معنوية بين أنواع البذور. تراوحت النسبة المئوية لوجود الفطور على مختلف البذور ما بين 0-42%، وكان الجنس *Fusarium* أكثر الأجناس الفطرية المعزولة ترددا وتأثيرا حيث أدى إلى حدوث عفن للبذور وذبول وموت البادرات. إن الإصابة الشديدة للبذور بتلك الفطور أدت إلى زيادة بصورة معنوية النسبة المئوية للبادرات المصابة. وقد وجد أن أفضل طريقة لتقليل عفن البذور وموت بادراتها إضافة إلى تحسين وزيادة نمو البادرات هي معاملة البذور حيويًا بخليط من نوعين من الفطر المضاد *Trichoderma* spp.

F 66

التباين الوراثي بين بعض العزلات المصرية والسورية للفطر *Fusarium oxysporum* f.sp. *ciceris*. صلاح عبد المؤمن¹، إسماعيل المحمد² وبسام بياعة³. (1) معهد بحوث أمراض النباتات، مركز البحوث الزراعية، الجزيرة، مصر، البريد الإلكتروني: salah1993@yahoo.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة البعث، سورية، البريد الإلكتروني: ismail_path@yahoo.com؛ (3) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: b.bayaa@cgiar.org

قدرت الاختلافات الوراثية بين تسع وثلاثين عزلة من الفطر *Fusarium oxysporum* f.sp. *ciceris*، الكائن المسبب لمرض الذبول الوعائي على الحمص، باستخدام طريقة التغير في شكل الحمض النووي الريبي المنقوص الأوكسجين (RAPD). جمعت خمس وثلاثين من هذه العزلات من ثماني محافظات مصرية، في حين استخدم مستخلص الحمض النووي لثلاث عزلات من سورية وواحدة من لبنان. أظهرت نماذج العصابات المتولدة من هذه العزلات باستخدام ست بادئات عشوائية مستويات مختلفة من التباين الوراثي بين وضمن العزلات من المواقع الجغرافية المختلفة بالنسبة للعزلات المصرية، في حين تجاوزت نسب التشابه بين العزلات السورية 90%. من ناحية أخرى، لوحظت نتائج متضاربة في سلوك كل من العزلة اللبنانية وإحدى العزلات السورية (عزلة الحقل المريض في إيكاردا) إزاء البادئات المستخدمة. علاوة على ذلك، استخدمت بادئات القطع الداخلية المنسوخة ITS 1,2 و ITS 1,4 مع 12 عزلة من بين العزلات 39 متضمنة العزلات السورية والعزلة اللبنانية في محاولة لكشف اختلافات وراثية أخرى، أعطى البادئ ITS 1,2 عصابة وحيدة ومفردة قياس 235 زوج قاعدي بينما أعطى البادئ ITS 1,4 عصابة وحيدة ومفردة قياس 556 زوج قاعدي دون وجود اختلافات وراثية بين العزلات المختبرة.

F 67

ذبول العدس في شمال غرب الجزائر. بلعبيد لخضر¹، مايكل باوم²، فرطاس الزهراء³، بوزناد زواوي⁴، عماد عجيل² وبلحسن ميلود³. (1) المركز الجامعي معسكر، ص.ب. 763، معسكر، الجزائر، البريد الإلكتروني: belabidl@yahoo.fr؛ (2) إيكاردا، ص.ب. 5465، حلب، سورية؛ (3) كلية العلوم، جامعة وهران، السانبا، الجزائر؛ (4) المعهد الوطني للزراعة، أحرش، الجزائر.

أظهرت نتائج مسح حقلي حديثة في عدة مناطق إصابات في حقول العدس بأمراض الذبول وتعفن الجذور المرتبطة بفطر *Fusarium*. تم اختبار القدرة الإراضية للعزلات المسببة للذبول الوعائي على صنف شديد الحساسية، ومنه ثبت وجود الشكل الخاص *Fusarium oxysporum* f.sp. *lentis* (FOL) المسبب للمرض، الأكثر انتشارا والمسؤول عن حدوث خسائر اقتصادية هامة. تم عزل 32 عينة فطرية من FOL من منطقة الساق لنبتات العدس المصابة بالذبول الوعائي، وللتمييز بين هذه العزلات استخدمت عدة معايير: المواصفات المورفولوجية والفيزيولوجية، القياس البيومتري والقدرة الإراضية (الشراسة والضراوة). كما تم تقدير التكامل الخضري للعزلات باستخدام طفرات mit، والتباين الشكلي باستعمال بصمة الحامض النووي ADN باستخدام تقنيات RAPD و AFLP. من خلال النتائج أظهرت عزلات FOL اختلافات واضحة في الشكل والصيغات

الأمر الذي يشجع على إجراء تحاليل أخرى لمعرفة البروتينات المعقدة التي يمكن أن تحتوي على بروتينات دفاع العائل المضيف وعوامل القدرة الإمراضية.

F 63

الأمراض المنقولة عبر البذور لبعض المحاصيل النجيلية (التشخيص والإصابة). نجيب أحمد محسن سلام، قسم وقاية النبات، كلية ناصر للعلوم الزراعية، جامعة عدن، اليمن، البريد الإلكتروني: najeebcurd2009@yahoo.com
هدفت الدراسة إلى مسح للفطريات والبكتيريا المرافقة لحبوب 8 أصناف من القمح و 6 أصناف من الذرة الرفيعة وصنفين من الذرة الشامية الأكثر انتشاراً في الجمهورية اليمنية. أظهرت إختبارات صحة البذور لهذة المحاصيل وجود الأجناس الفطرية التالية: *Aspergillus*, *Alternaria*, *Cladosporium*, *Fusarium*, *Curvularia*, *Drechslera*, *Rhizopus*, *Penicillium* وجنسين بكتيريين هما *Xanthomonas* و *Pseudomonas* مرافقة لحبوب أصناف القمح وكذلك الأجناس الفطرية نفسها وجدت في الذرة الرفيعة بالإضافة إلى الفطرين: *Colletotrichum* و *Cercospora*. وجد في بذور الذرة الشامية إضافة إلى الفطريات السابقة الفطر *Machrophomina phaseolina*. وقد كانت حبوب صنف القمح غنيمة أقل الأصناف تلوثاً (25%) وهو صنف جديد منتخب يمتاز بصفات إنتاجية عالية ويتحمل الملوحة ومقاوم للرقاد، وسجل صنف الذرة الرفيعة حيق أحمر أعلى نسبة إصابة (35.8%)، بينما كان الصنف البيئي أبيض أقلها تلوثاً (25%)، يليه صنف الصيف أبيض (30%). وبالنسبة للذرة الشامية، كان الصنف كنجاً (36%) أقل تلوثاً من الأمريكاني بذري. وقد أثر هذا التردد الفطري على البذور في جودتها ونسبة إنباتها، وبلغت نسبة إنبات بذور القمح والذرة الرفيعة والذرة الشامية 86.4%، 83.5% و 86.5%، على التوالي في إختبار ورق الترشيح القياسي الذي هو الأفضل في الإختبار للفحص البذور من طريقة أطباق بيئية الأجار PDA. وفي إختبار أعراض البادرات سببت في الغالب تعفن بذور، عفن جذور، ذبول البادرات ولقحة بادرات وفي إختبار القدرة الإمراضية للبكتيريا *Xanthomonas pseudomonas* أظهرت أعراض مرضية على بادرات القمح على شكل بقع طولية صغيرة صفراء اللون وتحولت إلى بني مسود مع ظهور إفرازات بكتيرية لوجة وتحول إلى قشور شفافة عند جفافها، وبإعادة العزل تبين أنها مستعمرات بكتيرية من نوع *Xanthomonas campestris* و *Pseudomonas syringae*. وقد أشارت الدراسة إلى أن التردد العالي للفطريات على الحبوب للقمح والذرة الرفيعة والذرة الشامية يتطلب دراسة محتواها من السموم الفطرية في ظروف الجمهورية اليمنية.

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تأثير إضافة أملاح الكالسيوم في حدوث أمراض موت البادرات لبقول الصويا في تربة ملوثة ببعض الفطور. محمود كمال محمود عرفة، ناجي محمد أبو زيد ومحمد محمود محمد، محطة بحوث جزيرة شندويل، سوهاج، مصر، البريد الإلكتروني: nashat_hafiz@yahoo.com

أدت إضافة أكسيد الكالسيوم أو هيدروكسيد الكالسيوم لتربة (طينية رملية - رملية طينية) بمعدل 0.03% من وزن التربة ملوثة صناعياً بالفطر *Rhizoctonia solani* إلى خفض معنوي لأمراض موت البادرات لصنف فول الصويا كلارك، وتساوت في التأثير مع معاملة البذرة بالمبيد الفطري فيتافكس 200. أدت إضافة أكسيد الكالسيوم بمعدل 0.01% من وزن التربة الملوثة صناعياً بالفطر *R. solani* والمنزرعة بثلاثة أصناف فول صويا أو أربعة محاصيل (شوندر سكري/بنجر السكر، الفول البلدي، البسلة، الفاصولياء)، أو إلى تربة طينية رملية ملوثة صناعياً بالفطرين *R. solani*, *F. solani* كلا على حده، إلى تقليل حدوث أمراض موت البادرات سواء كان قبل أو بعد الإنبات فوق سطح التربة وإلى زيادة عدد البادرات السليمة. أدت إضافة أكسيد الكالسيوم (عامي 1999 و 2000) بمعدل 28 غ/م في الخط (200 كم/للفدان) مع معاملة البذرة بالمطهر الفطري فيتافكس 200 كمعاملة منفردة أو الاثنين معا في حقل ملوث طبيعياً بالفطر *R. solani*، وأنواع من فطر الفيوزاريوم وفطور أخرى، والمنزرعة بثلاث أصناف فول صويا، تأثيرها في مكافحة أمراض موت البادرات وزيادة نسبة النباتات السليمة كان الأفضل في المعاملة المشتركة (أكسيد كالسيوم معاملة تربة = مطهر فطري معاملة بذرة)، وعند المقارنة مع كل معاملة على حدة. وتبين إن الفطرين *R. solani* و *F. solani* انخفضا في تربة ملوثة صناعياً بهما عند إضافة أكسيد الكالسيوم لها بمعدل 0.03%. ولم يمنع الرقم الأيدروجيني العالي للبيئة الصناعية أو للتربة، نمو فطور *R. solani*, *F. solani* و *Pythium ultimum* أو تكوينها للجراثيم/الأبواغ الكلاميدية أو الاسبورانجية. أدت الأمونيا الناتجة من محلول هيدروكسيد الأمونيوم أو من الأملاح النيتروجينية غير العضوية في التربة القلوية نتيجة إضافة أكسيد الكالسيوم إلى قتل الجراثيم/الأبواغ الكلاميدية أو الاسبورانجية للفطرين *F. solani* أو *Pythium ultimum*.

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تعريف السلالات الفيزيولوجية للفطر المسبب لصدأ الاوراق على القمح في سورية خلال الموسمين 2004 و 2005. عمر يحيوي، نجلاء معراوي ومنذر النعيمي، المركز الدولي للبحوث الزراعية في المناطق الجافة (ايكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: m.naimi@cgiar.org

يعدّ صدأ الاوراق من الأمراض المهمة التي تؤثر في القمح في معظم مناطق زراعته في العالم، إن تكرار ظهور المرض في سورية في السنوات الأخيرة قد يشير إلى تغير في الأنماط المرضية للفطر المسبب الموجودة في سورية طبيعياً. وقد جمعت عينات الاوراق المصابة من تسعة مناطق مختلفة، وبعد تنقيتها وإكثارها تحت ظروف الدفيئة بدءاً من بثرة يوريدية واحدة، وتم إختبار كل منها على مجموعة مؤلفة من ستة عشر صنفاً من أصناف القمح التفرقية التي يحتوي كل منها على مورث واحد للمقاومة. حددت السلالات الفيزيولوجية باستعمال الأنماط الظاهرية (شرس، غير شرس) تم تحديد 68 سلالة منتشرة في سورية. أربعة منها BBBC، PSTQ، BBBB BLBL موجودة في أكثر من منطقة. وظهرت سلالتان منها BLBL و PSTQ في كلا الموسمين. وكان التنوع في تركيبية السلالات الفيزيولوجية واضحاً بين مختلف المناطق.

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انتشار أعفان جذور القمح في شمال شرق سورية وتحديد مسبباتها. عمران يوسف¹، حليم يوسف¹، صفية المصري² وعدنان النحلوي². (1) مركز البحوث العلمية الزراعية في القامشلي، الهيئة العامة للبحوث العلمية الزراعية، القامشلي، سورية، البريد الإلكتروني: om_youssef@yahoo.com؛ (2) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113 دمشق، سورية.

بينت نتائج تقصي أعفان جذور القمح في شمال شرق سورية خلال العامين 2003 و 2004 انتشار المرض. أجري مسح حقلي خلال العامين 2003 و 2004 بهدف تحديد مسببات أعفان جذور القمح في شمال شرق سورية. بينت النتائج أنه غالباً ما تنجم هذه الأمراض عن أكثر من نوع فطري تنتمي بشكل أساسي للجنسين *Fusarium* و *Helmenthosporium* وتردد من بينها بشكل أكبر الأنواع *F. culmorum* و *F. graminearum* و *H. sativum* بنسب بلغت 56.8% و 30.93% و 26.13% على التوالي. بلغ انتشار المرض خلال عامي الدراسة 26.67% و 34% وسجل أعلى متوسط شدة إصابة على القمح القاسي 1.7 وعلى القمح الطري 0.8 حسب سلم مرضي رباعي (0-3). بينت إختبارات القدرة الإراضية أنه لم تكن كل العزلات الفطرية ممرضة بمفردها، ووجد ارتباط إيجابي ما بين سرعة نمو المستعمرات الفطرية للعزلات المختبرة ومقدرتها في إحداث الإصابة.

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التصنيف الجزيئي لعزلات الفطر *Pyrenophora graminea* وتفاعلها مع الشعير. محمد عماد الدين عرابي ومحمد جوهر، قسم التقانة الحيوية، دائرة أمراض النبات، هيئة الطاقة الذرية السورية، ص.ب. 6091، دمشق، سورية، البريد الإلكتروني: miaraabi@aec.org.sy

استخدمت المعلمات الجزيئية IGS-RFLP و RAPD و SDS-PAGE من أجل دراسة التنوع الوراثي بين عزلات العامل الممرض *Pyrenophora graminea* المجموعة من مناطق مختلفة في سورية. إضافة إلى ذلك جرى درس تفاعل هذا الفطر مع الشعير باستخدام طريقتي الزجاج *In vitro* والرحلان الكهربائي SDS-PAGE. كانت منطقة الفراغات البينية IGS متباينة بين العزلات وبالتالي تم الحصول على أنماط وراثية أحادية مختلفة (haplotype). على أية حال أشارت المعلمات الوراثية المستخدمة إلى التنوع الكبير في عزلات الممرض إضافة إلى وجود توافق محدود في توزيع هذه العزلات في شجرة القرابة ومنشأها الجغرافي مما يفترض انتقال هذا المرض بين مناطق القطر. ومن ناحية أخرى أظهر التقدير الكمي في الزجاج (*In vitro*) لتفاعل هذا الفطر مع الشعير اعتماداً على حساب النسبة المئوية لقطع السويقة تحت التاجية المعطية لهيفات الفطر على سطح بيئة بطاطا دكستروز أغار إلى وجود علاقة ارتباطية معنوية ($r = 0.97, P < 0.05$) بين تجارب الزجاج وتلك الحقلية، كما أشارت النتائج إلى وجود علاقة ارتباطية عالية المعنوية بين تجارب الزجاج المختلفة وتجارب الحقل، مشيرة بذلك إلى إمكانية تكرارية هذه التقنية والحصول على نتائج مشابهة. وبهدف فهم هذا المرض وتفاعلاته على المستوى الوراثي مع نبات الشعير استخدمت طريقة الرحلان الكهربائي [SDS-PAGE حزم الهوريدين المجموعات (D، C و B)] لخمس أصناف شعير ملقحة بعزلات منتخبة حيث أشارت النتائج إلى غياب تحت حزم الهوريدين معينة وتحطم بعضها الآخر وذلك لدى معظم الأصناف الملقحة بعزلات ذات فوعه مرضية عالية. وجدت أنماط تفاعل معقدة بين العزلات والأصناف ارتبطت بتغيرات الفوعه المرضية ومستويات المقاومة على التوالي. تماثلت أعداد التعددات الشكلية لتحت الحزم من خلال الإختبارات المختلفة (عزلة/صنف). علاوة على ذلك، لم تظهر إختبارات الحبة الواحدة للبذور غير الملقحة أي اختلاف في نماذج الهوريدين، مما يرجح سبب التغيرات الكائنة في البذور الملقحة إلى العدوى بالفطر *P. graminea*. تميزت هلامات الهوريدين بتكرارية عالية،

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تحديد السلالات الفيزيولوجية لفطر *Puccinia triticina* المسببة لمرض صدى أوراق القمح، في شمال سورية وجنوب تركيا. محمد قاسم¹، أحمد الأحمد¹، محمد شفيق حكيم² وميلودي نشيط³. (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، سورية، البريد الإلكتروني: agromohd@scs-net.org؛ (2) قسم المحاصيل الحقلية، كلية الزراعة، جامعة حلب، كلية الزراعة؛ (3) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، حلب، سورية.

يعد مرض صدى الأوراق على القمح المتسبب عن فطر *Puccinia triticina* Eriks من أهم أمراض الصدى التي تعترى القمح في العالم. وتزايدت أهميته بشكل ملفت للنظر في سورية خلال العقد الأخير بسبب التوسع في مساحة الحقول المروية وتضاعف مساحة الأراضي المزروعة بالقمح القاسي الأكثر قابلية للإصابة لهذا المرض. ونظراً لأهمية هذا المرض وغياب الأعمال الأكاديمية المتعلقة به، فقد هدفت هذه الدراسة إلى تحديد السلالات الفيزيولوجية الممثلة للمجتمع الطبيعي للفطر الممرض *Puccinia triticina* المنتشرة في شمال سورية وبعض مناطق جنوب تركيا وذلك خلال عامي 2003 و2004، وفق أنظمة التسمية المتبعة عالمياً. بينت الدراسة وجود 26 سلالة فيزيولوجية مختلفة في سورية وتركيا، تتبع لـ 14 مجموعة، وذلك تبعاً لنظام أمريكا الشمالية الحديث، وعند استخدام نظام التسمية الموحد كان هناك تسع سلالات فيزيولوجية، و 15 وفقاً لنظام التسمية الدولية، اختلفت هذه السلالات في درجة شراستها وترددتها.

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حصر لأنواع الفيوزاريوم المسببة لمرض تعفن ساق القمح بتونس. أسماء جرجوري، نورا إبراهيم ومحمد حاج لوي، المعهد الوطني للبحوث الزراعية بتونس، شارع الهادي الكراي، 2049 أريانة، تونس، البريد الإلكتروني: sgargouri@yahoo.com

يعد تعفن الساق الفيوزاريومي للقمح والشعير من أكثر الأمراض انتشاراً تسببه أنواع مختلفة من فطور الفيوزاريوم المتواجدة في التربة لا سيما في المناطق الجافة. ولتشخيص هذه الأنواع على نبات القمح، جمعت عينات من 250 حقلاً ابتداءً من 2000 لغاية 2004. بينت الدراسة أن المرض متواجد في أغلب الحقول التي تم زيارتها. جرى تشخيص خمسة أنواع من الفيوزاريوم اعتماداً على الخصائص الشكلية وباستعمال البيولوجيا الجزيئية. اتضح من خلال هذه الدراسة الانتشار الواسع للفطرين *Fusarium culmorum* (68%) من جملة العزلات) وهو متواجد على جميع التقسيمات المناخية، و *F. pseudograminearum* (22%) وقد اقتصر انتشاره على المناطق الجافة وشبه الجافة. وقد بينت هذه الدراسة ارتباط انتشار هذين النوعين من الفيوزاريوم بالعوامل المناخية. وبينت دراسة القدرة الإراضية لـ 90 عزلة من *F. culmorum* و *F. pseudograminearum* مخبرياً أن كل العزلات قد سببت أعراضاً حادة لمرض تعفن الساق الفيوزاريومي وبدرجات متفاوتة.

F 59

دراسة تأثير كاسيات البذار الجهازية في مقاومة مرض التفحم المغطى على القمح الذي يحدثه الفطران *Tilletia caries* و *T. foetida*. سهام أسعد¹، عمور يحيى¹، باسم عطار²، سمير قدسية² ومنذر نعيمة¹. (1) المركز الدولي للبحوث الزراعية في المناطق الجافة، إيكاردا، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: s.asaad@cgiar.org؛ (2) كلية الزراعة، جامعة حلب، حلب، سورية.

درس تأثير معاملة البذار على حبوب تسعة أصناف من القمح متباينة الحساسية للإصابة والمعدة اصطناعياً بمستويين من فطر التفحم المغطى (*Tilletia caries* و *T. foetida*)، إضافة للشاهد غير المعدى وذلك في محطة تل حديا، إيكاردا، سورية. حيث استخدمت 10 من كاسيات البذور الجهازية وهي: سلسنت إكسترا FS 050، سلسنت م FS 025، راكسيل 25 FS، أليوس 300 FS، واكيل 32.5 XL، أبرون 350 ES XL، ديفيدانت ستار FS، ديفيدانت FS 030، فيتافاكس S200، هوريزون، إضافة إلى الماء الذي استعمل كشاهد. أظهرت النتائج الحقلية أن كلا من مبيدات ديفيدانت ستار FS، ديفيدانت FS 030 وسلسنت إكسترا 050 أعطت مكافحة كاملة للفطر مقارنة مع الشاهد (72%). بينما أبدى الكاسي الفطري سلسنت م FS 025 أقل نسبة مكافحة مقارنة مع الشاهد (53%). كما أظهرت النتائج الحقلية لأصناف القمح المختبرة والحساسة للفطر أن صنف القمح القاسي (شام 1) كان أكثر الأصناف حساسية للإصابة بفطر التفحم المغطى، تلاه صنف القمح الطري الربيعي (QIMMA-10) وأخيراً صنف القمح الطري الإختياري (GUN) facultative، وكانت نسبة الإصابة الحقلية 72، 40 و 6%، على التوالي.

F 54

أهمية مرض تعفن الجذور الشائع على القمح في سورية. محمد الخليفة¹، أحمد الأحمد²، موفق يبرق¹، محمد أزرق³ وميلودي نشيط³. (1) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث الزراعية بحلب، حلب، سورية؛ البريد الإلكتروني: m.khalifa@cgiar.org؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية؛ البريد الإلكتروني: a.el-ahmed@cgiar.org؛ (3) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: m.nachit@cgiar.org

يعد مرض التعفن الشائع للجذور على القمح مرضاً مهماً على مستوى العالم، بما في ذلك سورية. وقد يكون المرض عاملاً محدداً لإنتاج القمح في العالم. ويعد ظهور بقع بنية غامقة على العقدة تحت التاجية (SCI) المؤشر الأول عن حدوث الإصابة. ووجد أن عدة فطور ترافق إصابة النبات وبخاصة أنواع *Fusarium spp.* و *Helminthosporium sativum*. وهدف هذا العمل إلى: (1) مسح انتشار المرض في حقول القمح الصلب في المحافظات السورية؛ (2) دراسة تأثير المرض في الغلة ومكوناتها تحت الظروف الحقلية. نفذ المسح في 5 و7 محافظات تزرع القمح الصلب في سورية خلال عامي 2003 و2004. وتم اختبار العقدة تحت التاجية لكل عينة نباتية لمعرفة مدى إصابتها بالمرض، وشدة الإصابة وذلك على مقياس من 0-3. أظهر المسح، في الموسم الأول، أن معدل الإصابة وشدة الإصابة في محافظة الحسكة كانت الأعلى في حين كانت تقييم هذين المعيارين الأقل في محافظتي حلب وإدلب. وفي الموسم الثاني، سجلت نتائج مماثلة في حقول محافظة الحسكة فيما يخص معدل الإصابة وشدها في حين سجلت أقل إصابة في محافظة إدلب. ولدراسة تأثير التعفن الشائع على الجذور في الغلة ومكوناتها، تمت زراعة أصليين وراثيين من القمح الصلب/القاسي وآخرين قمح طري/قمح خبز تختلف في مدى قابليتها للإصابة بالتعفن في حقل مريض وفي قطعة سليمة. ولوحظ انخفاض معنوي للغلة الحبية، عدد السنابل/نبات وعدد الحبوب/سنبل في النباتات المضابة وارتبطت هذه القيم سلباً مع شدة الإصابة. ولم يتأثر وزن 1000 حبة وارتبط بضعف بشدة الإصابة. كما نبأنت الخسارة في الإنتاج عند الأصول المختبرة، فتراوحت ما بين 3.5-32.9%.

F 55

تأثير فطر البياض الدقيقي (*Erysiphe graminis f. sp. hordei*) في بعض المقاييس الحيوية-الكيميائية عند الشعير (*Hordeum vulgare*). صليحة عطاب¹، نورة عليوي² ولوحيشي برينيس¹. (1) جامعة باجي مختار، قسم البيولوجيا، عنابة 23000، الجزائر؛ (2) قسم البيولوجيا، جامعة 8 ماي 1945، قالمة 24000، الجزائر، البريد الإلكتروني: allioui.n@caramail.com

يعد البياض الدقيقي المتسبب عن فطر *Erysiphe graminis* أحد الأمراض الأكثر شيوعاً على الشعير في الجزائر. ويرتبط مردود المحصول بصورة مباشرة بمستوى إصابة الأصناف، ويكون انخفاض المحصول كبيراً عند الأصناف الحساسة. وقد استخدمت خمسة أصناف من الشعير للكشف عن بعض التأثيرات المتوقعة حدوثها أو نشأتها في النباتات بسبب الفطر الممرض، واعتمد تقدير مقياسين حيويين كيميائيين، هما: السكريات المنحلة والحمض الأميني بروتين الحر في مراحل مختلفة من تطور المرض. أظهرت النتائج تباين قيم تراكم السكريات والبرولين أو تناقصهما تبعاً للصنف ووفقاً لطور الإصابة.

F 56

انتشار مرض البقعة القصديرية على القمح الصلب في سورية. رولة شمسي¹، عمر يحيوي²، أحمد الأحمد¹ وميلودي نشيط². (1) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: r.shamsi@hotmail.com

يعتبر مرض البقعة القصديرية (Tan Spot) المتسبب عن الفطر *Pyrenophora tritici-repentis* من أهم أمراض التبقات التي تصيب نبات القمح في العالم، إلا أن الأبحاث المتعلقة بدراسة هذا المرض لم تُجرى حتى الآن في سورية. ولذلك نفذ مسح في حقول القمح الصلب في المحافظات السورية التي تزرع القمح بهدف تحديد المناطق التي ينتشر فيها مرض البقعة القصديرية وتقدير نسبة الإصابة به والوقوف على أهميته، كما هدف البحث إلى دراسة أفضل المستنبتات المغذية للملانة لنمو الفطر وكذلك الظروف البيئية المناسبة لتبوغه. جُمعت عينات من نباتات القمح الصلب المصابة بالتبقات وعُزل الممرض منها. أظهرت النتائج انتشار مرض البقعة القصديرية في حقول القمح في محافظات الحسكة، حماة (الغاب)، حلب، إدلب، اللاذقية وحمص. وتراوحت نسبة الإصابة بالمرض ما بين الضعيفة والعالية، وبلغت 25، 37.5، 42.4، 44.4، 57.1، و7.14%، على التوالي. وبم يُسجل المرض في حقول بقية المحافظات (طرطوس، درعا، السويداء والرقّة). كما بينت الدراسة أن تنمية الفطر على مستنبت محضر من خضار متنوعة ودرجة حرارة 20 °س وإضاءة مستمرة كانت الأكثر مناسبة لنمو الفطر وتبوغه مقارنة مع أنواع مختلفة من المستنبتات المغذية.

تعريض هذه المنطقة للهضم بواسطة أنزيمي القطع *EcoRI* و *HaeIII* أن الأنزيم الثاني كان أكثر تبايناً في عدد وطول الشظايا المقطعة بالمقارنة مع الأنزيم الأول. وأظهرت خمسة بادئات فقط تبايناً بين العزلات وفقاً لتقانة RAPD. وحسب مقدار التشابه الوراثي ما بين كل من هذه العزلات باستخدام معامل التشابه جاكارد. وقد استخدم التحليل العنقودي لتصميم مخطط التشعب الذي أظهر العلاقة بينهم. وكان التشابه الوراثي للعزلات متبايناً، وتراوح ما بين 0.45 و 0.98. ونسب التشابه الوراثي الأخير إلى عزلات طهران، وصنفت كل العزلات في 16 مجموعة وراثية عند مستوى تشابه 75%. وأظهرت نتائج التحليل العنقودي وجود تنوع وراثي دون أي ارتباط بمنشأ العزلات الجغرافي أو بقدرتها الإمراضية. وكان التباين الوراثي ما بين عزلات هذا الممرض كبير جداً وفقاً لتقانة RAPD. ويعد تحليل RAPD أداة موثوقة بالمقارنة مع تقانة تفاعل السلسلة المبلمرة PCR، ويمكن استخدامه بكفاءة في تحليل المادة الوراثية للفطر *Fusarium solani*.

F 52

دراسة أمراض البطاطا/البطاطس بالمنطقة الغربية في ليبيا. فوزي العريفي بشية، منصف محمد الزنتوتي، مفتاح محمد معيوف، سناء الطيب شرلالة ونجية محمد المغربي، مركز البحوث الزراعية والحيوانية، طرابلس، ليبيا، البريد الإلكتروني: bisheya@yahoo.com

تعد البطاطا/البطاطس من محاصيل الخضار المهمة التي يتم زراعتها خلال فترتين، العروة الربيعية والشتوية، وتتعرض للإصابة بالعديد من الأمراض وبخاصة الأمراض الفطرية والبكتيرية والفيروسية والنيماطودا. أجري مسح حقلي للأمراض خلال الزراعة الربيعية والخريفية على مدى ثلاث سنوات 2003، 2004 و 2005 شملت مناطق قصر بن عشير، سوق السبت، المرازيق، الحمرونية، بئر التوتة، بئر التركي، تاجوراء، الوادي الشرقي، النشيع، القربوللي، السواني، العزيزية، الزهراء، المعمورة، الجليدة، والزواوية. دلت النتائج على انتشار مرض تعفن الدرنة الأم بعد حوالي 60 يوماً من الزراعة بنسبة 11% ومرض اللقحة المبكرة بنسبة 18% (الزراعة الربيعية 2003)، بينما كان متوسط نسبة الإصابة بمرض اللقحة المبكرة 3% و اللقحة المتأخرة 2.9% (الزراعة الربيعية 2004)، والقشرة السوداء 12.3%، والجرب العادي 9.3%، والنيماطودا 3.2% (الزراعة الخريفية 2005). كما لوحظ على درنات البطاطا/البطاطس بعض الأمراض الوظيفية ومنها تشوه الدرنة وتشققها والتي كان لها تأثير في الإنتاجية، وكان متوسط سطح الدرنة 11.2 سم²، ومتوسط عدد التشققات على الدرنة 4.3 سم، وطول الشق 3 سم، ومتوسط العمق 4.3 مم. وبلغت نسبة الإصابة بالجرب حوالي 37%، والقشرة السوداء 10.2% للعينات التي تم فحصها. كما شملت الدراسة أيضاً تقييم 18 صنفاً من البطاطا/البطاطس خلال الزراعة الربيعية والخريفية. وأوضحت النتائج تفاوت نسبة الإصابة على هذه الأصناف، وتراوح ما بين 0-12.3% تجاه مرض القشرة السوداء، و 0-2.7% إزاء مرض التعفن الطري، و 5-42.3% إزاء مرض الجرب العادي، وتضمنت النتائج تقدير الإنتاجية الكلية والقابلية للتسويق والمواصفات الأخرى ذات العلاقة بالتقييم.

F 53

دراسة أولية للحمولة الفطرية على حبوب القمح بعد الحصاد وخلال فترة التخزين. عمران يوسف¹ وحليم يوسف¹ وصفية المصري² وعدنان نحلاوي². (1) مركز البحوث العلمية الزراعية في القامشلي، الهيئة العامة للبحوث العلمية الزراعية، القامشلي، سورية، البريد الإلكتروني: salan_om@yahoo.com؛ (2) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص. ب. 113، دمشق، سورية.

خلال العامين 2004 و 2005 تم جمع 255 عينة من بذور القمح من مختلف مناطق محافظة الحسكة في مرحلتين: الأولى بعد الحصاد مباشرة وقبل تخزين المحصول والثانية بعد مرور 3 أشهر على الأقل من تخزين المحصول. تم عزل وتصنيف 47 نوعاً فطرياً تعود لـ 11 جنساً. كانت أكبر مجموعة من الأنواع الفطرية تعود للأجناس *Penicillium*، *Aspergillus* و *Fusarium* وبدرجة أقل للجنس *Alternaria*. وكانت أكثر أنواع الفطور تردداً على حبوب القمح خلال المرحلة الأولى تعود للأجناس *Alternaria*، *Cladosporium* و *Fusarium*، وبدرجة أقل أنواع الأجناس *Helmenthosporium*، *Aspergillus* و *Penicillium*، بينما سادت أنواع الجنسين الأخيرين في المرحلة الثانية، وتراجعت الأنواع التابعة لبقية الأجناس. وتراوح درجة تلوث حبوب القمح بالفطور ما بين 10×3^2 و 10×8.2^7 بوغ/غ حبوب.

الجدور بين معاملات غذيت نباتاتها بمستويات متباينة من الكالسيوم مضافاً إلى محلول هوجلاند المغذي. سجلت أعلى نسبة وشدة إصابة في نباتات البنجر/الشوندر السكري المغذاة على محلول هوجلاند يحتوي على 0 أو 1 ميلي مول من الكالسيوم (76%-80% و 4.52-4.08 على التوالي). وقد أدى استخدام مستوى 2 ميلي مول من الكالسيوم إلى إحداث انخفاض معنوي في نسبة الإصابة وشدها (68% و 3.38، على التوالي). وقد سجل أقل نسبة وشدة إصابة عند استخدام 4 ميلي مول من الكالسيوم (60% و 2.08، على التوالي). وأظهرت الدراسات التشريحية المرضية باستخدام الميكروسكوب الضوئي والميكروسكوب الماسح الإلكتروني توقف غزو الفطر للنسيج عند منطقة الأبيديرمس وعدم تمكنه من التوغل في منطقة القشرة وذلك عند استخدام تركيز 4 ميلي مول من الكالسيوم، وذلك على العكس من استخدام التركيزات الأقل من الكالسيوم في محلول التغذية.

F 49

البياض الدقيقي البطيء على الشوندر السكري/البنجر. م. شيخواسلامي¹، ح. يونس¹ و ج. بساتي². (1) قسم وقاية النبات؛ (2) قسم تربية الشوندر السكري، مركز البحوث الزراعية في كرمشاه، إيران، البريد الإلكتروني: mlshikh@yahoo.com
يعتبر مرض البياض الدقيقي على الشوندر السكري/البنجر من أهم الأمراض المنتشرة على هذا المحصول في العالم. وبما أن البيئة الجافة هي الملائمة لتطور هذا المرض، فإنه يبدو الأكثر ضرراً في المناطق الجافة بما فيها إيران. وأشارت دراسات حقلية إلى إصابة كلتا الطرز الوراثية المقاومة وكذلك القابلة للإصابة على حد سواء، إذ أن نسبة تطور المرض على الطرز الأولى كان أقل بكثير مقارنة مع الطرز الثانية. ولدى دراسة المرض تحت ظروف المختبر وجد أن كل من نسبة الكونديا المنتجة لميسليوم أولي متطاوول (إنشاش ناجح) من مجموع الكونديا المنتشة، وعدد الحوامل الكونديا، وكذلك الأبواغ المتطورة على الأوراق، كانت بالمقارنة أقل عند الطرز المقاومة. وتشير النتائج إلى وجود عدة عوامل ثانوية يمكن أن توفر مستوى مقبول من المقاومة للبياض الدقيقي على الشوندر السكري/البنجر، كي يبقى ما دون مستوى عتبة الضرر ويقلص من فرص حدوث سلالات جديدة من الممرض.

F 50

السمات الوراثية للفطر *Phytophthora infestans* المسبب للفحة المتأخرة للبطاطا/البطاطس واكتشاف الطراز A2 في تونس. ونام جمور، كلثوم حرباوي ووليد حمادة، مختبر الوراثة، المعهد الوطني للعلوم الزراعية لتونس (INAT)، 43 شارع شارل نيكول، 1082 تونس-مهران، الجمهورية التونسية، البريد الإلكتروني: hamada.walid@iresa.agrinet.tn
يعتبر الفطر *Phytophthora infestans* مسبب مرض الفحة المتأخرة على البطاطا/البطاطس، كما أنه يعرف بكونه واحداً من أهم الآفات التي تفتك بإنتاج البطاطا/البطاطس والطماطم/البندورة في العالم. يتكاثر هذا الفطر جنسياً بواسطة انطرزين الجنسين A1 و A2 بحيث يشكل خطراً فعلياً مرتبطاً بظهور سلالات متنوعة وراثياً بطريقة يصعب مراقبتها. في هذا الإطار قمنا بتحديد الطرز الجنسي بالنسبة للعزلات التونسية وذلك عن طريق إستعمال تقنيات تعتمد على البيولوجيا الجزئية باللمرة نوع CAPS. بينت نتائج تفاعل بوليميراز التسلسلي باستعمال البادئ W16 مع قصن الحمض النووي المنتج باستعمال الأنزيمات القاطعة *HaeIII* من وجود الطرز A2 (بنسبة 12.5% من مجموع العزلات التي تم تحليلها) لأول مرة في تونس من بين العزلات التي تم جمعها وتحليلها.

F 51

التحديد الجزيئي لعزلات فطر *Fusarium solani* في المناطق المنتجة للبطاطا/البطاطس في إيران. باغاي رافارين س¹، م. فالاهاتي راستيجر¹، ب. جافارپور¹، وم. ايسكانداري². (1) قسم وقاية النبات، كلية الزراعة، جامعة فردوسي، مشهد، إيران؛ (2) قسم بحوث الأمراض، مركز البحوث الطبيعية والزراعية في خوراسان، مشهد، ص.ب. 91775-1163، إيران، البريد الإلكتروني: sbaghaee81@yahoo.com

يعدّ الفطر *Fusarium solani* مسبباً لمرض الذبول والعفن الجاف على البطاطا، وهو يسبب سنوياً فقداً معنوياً في المحصول في مناطق إنتاج البطاطا في إيران. وقد هدف هذا البحث إلى عزل وتشخيص وتحديد التباين الوراثي في هذا الممرض في إيران. ولتحقيق هذا الهدف، جمعت العينات من الأجزاء المختلفة لنبات البطاطا المريضة: الساق، التاج، الجذر والدرنات. وتضمن إختبار القدرة الإمرضية إعداء التربة، وغمس الجذور، وإعداء الدرناات بالمعلق البوغي باستخدام الصنف أجريا وتجاه كل العزلات. وتم تقييم كمية التباين الوراثي في 28 عزلة ممرضة تم جمعها من 5 محافظات في إيران (طهران، همدان، أردابيل، رازافي وخورسان الشمالية) بواسطة تضخيم جزء من الحمض النووي الريبسي المنقوص الأوكسجين لريبوزومي (rDNA) المرتبط بالبادنان ITS4 و ITS5 وأيضاً بمجموعة من سبعة بادنان عشوائية. وقد قسمت عملية تضخيم جزء الحمض النووي الريبسي المنقوص الأوكسجين الريبوزومي جميع العزلات إلى مجموعتين، هما: ITS1 و ITS2. وأظهر

F 46

دراسة مرحلتي الإلقاح والاختراق في دورة أمراض الفطر *Alternaria alternata* العامل المسبب لمرض التبقع البني للتاجيرين والعفن الأسود للبرتقال نافل في شمال إيران. عباس علي ديهبوري¹، س. ف. الأفي² و أ. مجد³. (1) قسم علم الحياة، جامعة ولاية غايمشاهر الإسلامية، البريد الإلكتروني: adehpour@yahoo.com؛ (2) أمراض وأفات النبات، مركز البحوث الزراعية في مازاناران؛ (3) قسم علم الحياة، جامعة ولاية شمال طهران الإسلامية، إيران.

تسبب أنواع الألتيرناريا مرضين مختلفين على الحمضيات/المالح في شمال إيران: التبقع البني الألتيرناري للتاجيرين والعفن الأسود للبرتقال نافل. جمعت الأنسجة المصابة في هذه الدراسة من الأوراق والثمار والسوق الفتية للنباتات. قُطعت الأنسجة إلى أجزاء صغيرة (2 x 2 مم)، ثم ثبتت في محلول فوسفاتي منظم عياره 0.2 مول يحتوي على 2% غلوتيرالديهايد عند درجة حرارة 5°س طيلة الليل. عوملت المقاطع بعد التثبيت بتترا أوكسيد الأوزميوم عيار 1 مول لمدة 5 ساعات، ثم غسلت المحضرات ومررت خلال سلسلة من الكحولات متزايدة التركيز، وأخيراً جفدت المحضرات لمدة 5 ساعات. كسيت المحضرات بالذهب ومن ثم درست باستخدام المجهر الإلكتروني الماسح (SEM) من طراز LEO 435. وإتمام الفحص بواسطة المجهر الإلكتروني التلغيزيوني (TEM)، نفذت مقاطع دقيقة وفائقة الدقة (200 - 500 نانومتراً و 70 - 120 نانومتراً) في المحضرات بعد أن غطست في وسط الإسبيرغولة (Spurr's medium) وجرى تثبيتها في غلوتيرالديهايد وتترا أوكسيد الأوزميوم، ثم صبغت وشوهدت بواسطة المجهر الإلكتروني التلغيزيوني الذي يمتلك عدسات من النمط Ziess. أظهرت نتائج هذه الدراسة أن حدوث الإصابة يكون من خلال الثغور ومباشرة. وكان الاختراق المنتج من الكونيديا وعدم تشكل أعضاء الالتصاق يحدث من خلال الثغور. تخترق الهيغا الفجوة تحت الثغرية، وتنمو بعض التفرعات الهيغية في الفراغات ما بين الخلوية لطبقة الميزوفيل والأنسجة البرانشيمية المحيطة. تسببت منتجات الهيغا ولا سيما السموم (HST و NHST) أضراراً بالخلايا وجدها. أظهرت الدراسة أن هيغا الفطر لا تدخل في الأنسجة الخشبية.

F 47

عزل وتحديد الفطريات المصاحبة لبذور الشوندر السكري/البنجر (*Beta vulgaris* L.) ومكافحتها كيميائياً وبيولوجياً. نديم أحمد رمضان ونور عامر العبيدي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com

تم عزل سبعة أجناس فطرية (*Pythium*, *Phoma*, *Fusarium*, *Chaetomium*, *Aspergillus*, *Amorphotheca*) من بذور الشوندر السكري/البنجر المتحصل عليها من معمل السكر في الموصل وخمسة أجناس (*Rhizoctonia* و *Mucor*, *Macrophomina*, *Chaetomium*, *Aspergillus*) من البذور المتحصل عليها من كلية الزراعة، جامعة الإسكندرية، مصر. كما عزل نوعان يتبعان للجنس *Aspergillus* (*A. niger* و *A. fumigatus*). ظهر الفطر *Amorphotheca resiniae*, *F. solani*, *P. betae* و *P. ultimum* في بذور العراق، وفطريات *A. fumigatus*, *M. phaseolina* و *Mucor spp.* في بذور مصر. وكان عزل الفطريات *A. resiniae* و *Mucor spp.* لأول مرة من بذور البنجر السكري. أظهر اختبار رد فعل أصناف الشوندر السكري/البنجر للفطريات المعزولة من البذور عدم وجود صنف مقاوم وكان الصنف FD9993 متوسط القابلية للإصابة، إذ بلغ معدل نسبة النباتات الناجية 54.5%. وكان أشد الفطريات إمرضية هو *P. ultimum* حيث بلغ معدل النباتات الناجية للأصناف 16.66% وكان الفطر *M. phaseolina* ضعيف الإمرضية ومعدل نسبة النباتات الناجية 60.66%. ومن جهة أخرى فقد وجد أن أفضل المبيدات في مقاومة الفطريات المعزولة من البذور هو البينوميل بنسبة تثبيط 100% عدا الفطريات *M. phaseolina* و *P. ultimum* بنسبة 94.4 و 78%، على التوالي، بينما ثبت مييد الروفرال الفطريات عدا *A. resiniae* و *C. Globosum*. كما استخدمت البكتريا *Bacillus cereus* لأول مرة في هذه الدراسة وسببت تثبيط الفطريات المعزولة من بذور الشوندر السكري وقد وصلت نسبة التثبيط للفطر *R. solani* إلى 91.9% و *F. solani* كانت 84.4% واختلفت معنوياً عن بقية الفطريات. بينما استطاعت البكتريا *B. subtilis* تثبيط الفطريات بدرجة عالية ولم يكن هناك فروق معنوية بين الفطريات. أما البكتريا *Pseudomonas flourcence* فسببت تثبيط الفطر *P. ultimum* بنسبة 100% ولم يكن هناك فروق معنوية مع الفطر *A. resiniae* و *P. Betae*، أما بقية الفطريات فكان تثبيطها منخفضاً.

F 48

دور الكالسيوم في مقاومة مرض عفن جذور الشوندر السكري/بنجر السكر. مصطفى محمد عاشور الخولي¹، أحمد ذكي علي² وأيمن محمد حسني عش¹. (1) أمراض المحاصيل السكرية، معهد بحوث المحاصيل السكرية، مركز البحوث الزراعية، الأورمان 12619، الجيزة، مصر؛ (2) أمراض نبات، قسم النبات الزراعي، كلية زراعة الزقازيق، مصر، البريد الإلكتروني: el_kholi@yahoo.com

هدفت الدراسة إلى إظهار دور الكالسيوم في دعم مقاومة جذور بنجر السكر/الشوندر السكري لمرض تعفن الجذور المتسبب عن فطر *Rhizoctonia solani* تحت ظروف الدفيئة. ظهرت اختلافات معنوية عالية في نسبة الإصابة وشدها بتعفن

F 43

البحث في السلالات والتنوع الوراثي في مجتمع الفطر *Fusarium oxysporum f.sp. lycopersici* في المنطقة الشمالية واقليم رازافي خوراسان في إيران باستخدام المعلمات الجزيئية بتقانة RAPD. نيدارزاده، ن.، م. فالاهاتي راسنجار، ب. جافاريبور، قسم أمراض النبات، كلية الزراعة، جامعة فردوسي في مشهد، ص.ب. 91775-1163، إيران، البريد الإلكتروني: nahidheidarzadeh@yahoo.com

نفذت هذه الدراسة بهدف تشخيص السلالات الفيزيولوجية والتنوع الوراثي لفطر *Fusarium oxysporum f. sp. lycopersici* مسبب مرض ذبول البندورة/الطماطم. وأمكن إعادة عزل 35 عزلة من الفطر *Fusarium oxysporum* من سوق وتاج وجذور نباتات البندورة المصابة التي جمعت من حقول المناطق الرئيسية لإنتاج البندورة في محافظتي الشمالية ورازافي خوراسان خلال عامي 2004 و2005. وكانت 25 عزلة منها قد أظهرت قدرة إمرضية تجاه صنف البندورة Bonny Best، بينما كانت 10 عزلات غير ممرضة وفقاً لنتائج اختبار القدرة الإمرضية. وتشير نتائج اختبار التخصص النمطي لنباتات متنوعة، مثل: البندورة Bonny Best، البقم Datura، الحمص Cicer، الشمام Melon، والمغد Nightshade أن جميع العزلات (25 عزلة) كانت ممرضة للبندورة، وكانت في الوقت نفسه غير ممرضة لنباتات الأنواع الأخرى المختبرة. وقد تم تشخيص سلالات الفطر باستخدام العوائل التفرقية التالية: VFN-8 (مقاوم للسلالة 1)، Walter (مقاوم للسلالتين 1 و2)، وصنف البندورة Bonny Best (حساس)، وكانت جميع العزلات ممرضة لصنف البندورة Bonny Best وغير ممرضة لنباتات الأصناف التفرقية الأخرى. وأثبتت هذه النتائج وجود السلالة 1 في منطقة الدراسة. وأعيد اختبار 25 عزلة الممرضة بتقانة RAPD، واستخدمت عشرة بادئات في هذه الدراسة، وأظهر التحليل العنقودي وجود 12 مجموعة متميزة وراثياً. ولم تثبت نتائج التحليل العنقودي وجود أي علاقة ما بين التنوع الوراثي والمصادر الجغرافية لهذه العزلات.

F 44

التوصيف الإمرضي والوراثي لعزلات من *Fusarium solani f.sp. phaseoli* باستخدام تحليل AFLP. سن. زاره زاده، م. فالحاتي راسنجار، ب. جعفر بور وا. مهدي خاري، قسم وقاية النبات، كلية الزراعة، جامعة فردوسي بمدينة مشهد، ص.ب. 91775-1163، إيران، البريد الإلكتروني: sa_zal770@yahoo.com

يعد مرض تعفن جذور الفاصولياء، والذي تظهر أعراضه على شكل ذبول واصفرار للنباتات مرضاً مهماً يرافق هذا المحصول محدثاً أضراراً شديدة وخسائر محصولية سنوية. وتم القيام خلال الفترة 2004-2005 بمسح لهذا المرض في المناطق الرئيسية لزراعة الفاصولياء في مقاطعات رازافي، شمال خراسان وطهران بايران وتم الحصول على 40 عزلة من *F. solani* حفظت على وسط SNA أو في زجاجات ماكاراتي محتوية رملاً معقماً وذلك للخرن القصير والطويل الأمد. وتم إجراء المقدر الإمرضية على بادرات فاصولياء باستخدام طريقة غمس الجذور ووضع حبوب ذرة بيضاء معدة بالفطر حول الجذور الليلية للعائل. وأظهرت دراسات المدى العوائلي للفطر أن العزلات الممرضة تحدث تعفنًا لجذور الفاصولياء فقط. وبالاستناد إلى اختبار المقدر الإمرضية، والتخصص على العائل والمواصفات المظهرية، تم تعريف الفطر على أنه *Fusarium solani f.sp. phaseoli*. وتم باستخدام طريقة تحليل AFLP دراسة العلاقة الوراثية ما بين العوائل الطبيعية للفطر *F. solani* وأنجز ذلك بهضم DNA الفطر بوجود أنزيمي التحديد الداخلي EcoRI و Tru9I. وتم تقدير كمية التنوع الوراثي بواسطة تضخيم تفاعل البوليمراز المتسلسل بوجود ثلاثة أزواج من بادئات نيوكليوتيدات انتخابية. وتشير النتائج المتحصل عليها إلى عدم كشف اتجاه واضح بين التجمع في نندروغرام AFLP والمصدر الجغرافي والنمط الوراثي للعائل للعزلات المختبرة، مع استثناءات قليلة.

F 45

تأثير تعريض العزلة المحلية من الفطر *Alternaria alternata* للأشعة فوق البنفسجية في إنتاج السكر المتعدد والسم الفطري. محمد بشير اسماعيل وعصام داود سليمان، قسم علوم الحياة، كلية التربية، جامعة الموصل، العراق، البريد الإلكتروني: esamdawood@yahoo.com

تم تعريض الأبواغ الكونيدية للفطر *Alternaria alterenata* المعزول من ثمار البندورة/الطماطم الشتوية في العراق لفترات مختلفة من الأشعة فوق البنفسجية لغرض معرفة تأثيرها في إنتاجية السكريات المتعددة والسم الفطري. وقد تحفز إنتاج الفطر من السكريات المتعددة في الوسط الغذائي المنتخب عند تعريضها للأشعة لمدة 20 دقيقة، وبلغ 3.78 غ/ليتر في المزارع المهترزة، كما انعدم إنتاج السم في جميع العزلات المطفرة من الفطر.

F 41

تحضير الـ Bio-phos ودوره في تغذية ومقاومة نبات الرقي/البطيخ الأحمر (*Citrullus vulgaris* L.) للإصابة بمرض
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assaffii2004@yahoo.com

نفذت تجربة مختبرية لتحضير مادة الـ Bio-phos بناءً على مشاهدات حقلية لثلاثة مواسم في حقول منطقة الدوار الواقعة غرب مدينة الرمادي 25 كم، باستعمال خليط من تربة طينية ومسحوق نباتات السعد *Cyperus rotundus* Linn. والقصب *Phragmites australis* ونشارة خشب اليوكالبتوس *Eucalyptus microtheca* بنسب 20، 10، 40 و30%، على التوالي (اختيرت هذه المكونات بناءً على المشاهدات الحقلية). مزجت المكونات مع مسحوق الصخر الفوسفاتي Rock phosphate-appetite بنسبة 1:1، ورطبت بالشرش/مصل الحليب المعقم. ثم لقحت بالبكتيريا *Streptomyces* sp. و *Pseudomonas fluorescence* المعزولة من مواقع المشاهدات (لتمييزها بأعلى كثافة ميكروبية على جذور النباتات السليمة بالمقارنة مع المصابة)، وحضنت عند درجة حرارة 28 ± 2 °س لمدة 10، 20 و30 يوماً. أجريت بعض الفحوصات المختبرية وحللت النتائج إحصائياً. أشارت النتائج الى تميز المادة المحضرة من لقاح العزلة *Streptomyces* sp. والمحضنة لمدة 30 يوماً (Bio-phos-st.) بمحتواها العالي من الفوسفور والنيتروجين والكالسيوم والمغنيسيوم وحامضي الهيومك والفالفيك إضافة للكتلة الحية وإنتاج مركبات sidrophores، تلتها معاملة المادة المحضرة من لقاح البكتيريا *P. fluorescence* والمحضنة لمدة 20 يوماً (Bio-phos-ps). اختبرت قدرة المواد المحضرة ومستخلصاتها (1:5 بالماء المقطر المعقم) في تثبيط نمو الفطر *Fusarium* sp. أظهرت النتائج قدرة تثبيط عالية لمستخلص المادة Bio-phos-ps المحضنة لمدة 20 يوماً، بينما امتازت المادة Bio-phos-st. بقدرة متزايدة على التثبيط مع تقدم مدة الحضانة. استعملت المادتين المتميزتين في تحضير ثلاث معاملات Bio-phos-st. و Bio-phos-ps وخليط بنسبة 1:1، أضيفت بمقدار 5 غ للنبات بثلاث طرائق الأولى مع البنور والثانية بدفعتين نصف الكمية مع البنور والمتبقي بعد شهر من الإنبات والثالثة أضيفت بعد شهر من الإنبات. نفذت التجربة في حقول المشاهدات المزروعة بنباتات الرقي/البطيخ الأحمر من صنف Charleston Negara، سجلت نسبة الإصابة ومعدل الإنتاج، وأكدت النتائج تفوق معاملة الخليط المجزأة على دفتين، وكانت نسبة الإصابة أقل (8.5%)، والإنتاج أعلى (40 طن/هـ).

F 42

التنوع الجزيئي للفطر الداخلي *Neotyphodium* في الهشيمية باستخدام أنماط RFLP-PCR لمناطق rDNA-ITS.
ب. شريف نايبي و أ.ف. ميرلوهي، كلية الزراعة، جامعة أصفهان للتكنولوجيا، أصفهان، إيران، البريد الإلكتروني:

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تعدّ الهشيمية (*Festuca* spp.) من نباتات المروج والمراعي المهمة. ووجد أنها تصاب في إيران بالفطر الداخلي *Neotyphodium*. وتنمو الفطور الداخلية التابعة لهذا الجنس داخل أوراق النباتات المصابة دون إحداث أية أعراض ظاهرة. ويمكن كشف هذه الفطور داخل النباتات باستخدام تقاني نسيجية كيميائية، مناعية، زراعة النسيج والتقاني الجزيئية. وقد تم الحصول على سبع عزلات من الفطر *Neotyphodium* من الأنصال الورقية للنوعين *Festuca arundinacea* و *F. ovina*. وتم عزل DNA المجيني من الميسيليوم باستخدام طريقة CTAB. كما استخدم البادنان III و IIII لتعريف الفطر *N. coenophialum* اللذان أنتجا أنتج عصابات بطول 1000 زوج قاعدي، ووجد أن جميع العزلات تتبع هذا النوع باستخدام بادئات ومناطق نوعية لإعادة تركيب العلاقات الفيلوجينية عند مستويات تصنيفية للنوع. وكانت الأمبليكونات المستخدمة لتحليل RFLP مع إنزيمات التحديد *Cfo* و *Taq I*. وتم توكيد/تفسير وجود أو غياب العصابة بطريقة انشطارية (0/1). واستخدم الماتريكس في التحليل العنقودي باستخدام طريقة UPGMA والبرنامج NTSYS النسخة 2.2. واستناداً لشكل الدندروغرام المتحصل عليه باستخدام إنزيمات التحديد، تم تجميع خمس عزلات للفطر من نبات *F. arundinacea* متشابهة مظهرياً في مجموعة واحدة. في حين وضعت العزلة FAKH والتي كانت مختلفة مظهرياً عن باقي العزلات في مجموعة ثالثة وكانت مماثلة مظهرياً للعزلة *N. festuca*. وعليه فإنه من الضروري تحديد تتالي هذا النمط من *N. coenophialum* والذي أعطى عصابة بطول مماثل (1000 زوج قاعدي)، ولكن بمواصفات شكلية مختلفة. وتشير المقارنات الأولية إلى أن الاختلافات المظهرية في أنواع *Neotyphodium* تتطابق مع اختلافات في أنماط RFLP لمنطقة ITS من المورثات الصبغية، وهناك حاجة لمزيد من العينات وأنزيمات التحديد للتأكد من القيمة التمييزية لهذه النتيجة.

F 37

انتشار مرض البياض الزغبي على الكوسا في مصر ومكافحته. شوقي محمد الدسوقي، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، 9 شارع جامعة القاهرة، 12619 الجيزة، مصر، البريد الإلكتروني: shawkidesouki@yahoo.com
يعد مرض البياض الزغبي على الكوسا مرض واسع الانتشار في مصر. لوحظت أعراض الإصابة بمرض البياض الزغبي على هجن مختلفة من الكوسا مزروعة تجارياً بمحافظة المنوفية والقليوبية خلال موسم الخريف عام 2001، حيث انتشر المرض بسرعة على الأوراق وأثر في النباتات المصابة مسبباً حالة وبائية شديدة. درس ظهور وتطور المرض بمحافظتي المنوفية والقليوبية خلال سنوات 2002 و 2003، وتم وصف الأعراض وتسجيل شدة الإصابة. وقد أوضحت دراسة القدرة الإراضية تحت ظروف غرف الرطوبة في الصوبة/الدفينة باستخدام العزلات المختلفة للفطر الممرض ازاء صنف الكوسا القابل للإصابة "اسكندراني" قدرة جميع العزلات على إصابة الصنف المختبر. وتم اختبار وتقييم الهجن المختلفة من الكوسا ضد الإصابة بالمرض تبعاً لطرز الإصابة المتخصصة بمرض البياض الزغبي. تم تسجيل شدة الإصابة بالمرض (DS) تحت ظروف الحقل ومساحة المرض تحت منحى الإصابة (AUDPC) وكذلك أعلى معدل لتطور المرض (r-value). وقد أظهرت الهجن المختلفة مستويات مختلفة لحدوث المرض. خفضت جميع المبيدات الفطرية المستخدمة من حدوث المرض في كل مواعيد الرش المختلفة. وكانت المبيدات الفطرية الجهازية أكثر كفاءة من المبيدات التي تؤثر باللامسة.

F 38

القدرة الإراضية والسمية والمحتوى من حامض جيريك للفطر *Fusarium moniliforme* المسبب لعفن الجذور وسقوط البادرات في الفلفل. هايدى إبراهيم جبر أبو النجا¹ ونجلاء جلال أحمد². (1) قسم أمراض النبات، كلية الزراعة، جامعة أسيوط، مصر؛ (2) معهد بحوث أمراض نبات مركز البحوث الزراعية، الجيزة، مصر.
عزل في هذا البحث فطر *Fusarium moniliforme* من جذور نباتات مختلفة من الفلفل/الفليفلة المصابة طبيعياً، كما اختبرت القدرة الإراضية للفطريات المعزولة على أصناف فلفل/فليفلة سليمة. وجد أن الصنف لانج ريد كاجين كان أكثرها إصابة، ثم الصنف المحلي وكاليفورينا، ثم كاليفورينا وندر تحت ظروف الصوبة/الدفينة، كذلك وجد تباين في القدرة الإراضية بين العزلتين المختبرتين. وأظهرت عزلات فطر *Fusarium moniliforme* اختلافاً في إنتاجها للفيومونيسين والزيرونين وحامض الجيريك في المختبر. قيمت نباتات الفلفل/الفليفلة ازاء الفطر *Fusarium moniliforme* وتركيز فيومونيسين وزيرونين.

F 39

دراسة مرضية نسيجية لتأثير تلوث المحاصيل والأعلاف بالأوكراتوكسينات خلود السامرائي¹، كوكب سليم القيسي² وابتهاال حسين النعيمي³. (1) مركز بحوث التقنيات الاحيائية، جامعة النهريين؛ (2) الكلية الطبية، جامعة النهريين؛ (3) جامعة النهريين، العراق، البريد الإلكتروني: khulood_whyeb@yahoo.com
تعد الأوكراتوكسينات منتجات أفضية ثانوية تنتجها بعض الأنواع الفطرية من جنسي *Aspergillus* و *Penicillium* على السلع الزراعية المختلفة (مثل الذرة) مسببة خسائر اقتصادية كبيرة وأضرار صحية بالإنسان والحيوانات. أظهرت نتائج الدراسة المرضية للتسمم بالأوكراتوكسينات حدوث تغيرات مرضية في الكبد متضمنة تغيرات مدمرة في البنية الكبدية وظهور فجوات في سايتوبلازما الخلية الكبدية ونزف في الأوعية الدموية. وبينت الدراسة بالمجهر الإلكتروني وجود تدهور في الأنوية والسايتوبلازما والميتوكوندريا وفي شبكة الجبلة الداخلية.

F 40

تشخيص أشكال مختلفة وراثياً من الفطر *Botrytis cinerea* في تونس. درصاف بن أحمد ووليد حمادة، المعهد الوطني للعلوم الفلاحية بتونس، 43 شارع شارل نيكول، 1082 تونس، الجمهورية التونسية، البريد الإلكتروني: hamada.walid@iresa.agrinet.tn
يسبب الفطر *Botrytis cinerea* مرض التعفن الرمادي عند كثير من المزروعات. هدف هذا البحث تقييم التنوع الوراثي عند الفطر *B. cinerea* في تونس باستخدام المؤشرات الجزيئية ومستوى المقاومة للمبيدات. وأمكن التعرف على مجموعتين من الفطر وذلك اعتماداً على عناصر متقلة وهما *Boty* و *Flipper*. أثبتت التحاليل باستعمال طريقة البلمرة على الحامض النووي لفصائل الفطر وجود المجموعة *transpoa* بنسبة 78% والمجموعة *vacuma* بنسبة 4%. كذلك تم تحديد العنصر *Boty* منفرداً في بعض العزلات. لقد اهتمنا في هذه الدراسة بالجين *Bc-hch* المشابه للجين الموجود عند الفطر *Neurospora crassa* والمتسبب في عدم التوافق بين الفصائل. الشيء الذي سمح لنا بالحصول على نوع واحد والموافق *Bc-hchII* وعدم وجود النوع الموافق *Bc-hchI*، والذي وقع اكتشافه في بعض العينات الفطرية الفرنسية لدى هضمه بالأنزيم *Hhal*. هذه التحاليل مكنت من استنتاج وجود نوع وحيد من الفطر في تونس وهو *B. cinerea*.

F 34

قابلية بعض الفطريات المعزولة من نبات الكلغان *Silybum marianum* L.Gaerth في إنتاج أنزيم السليلوليز. ورقاء سعيد
قاسم الطائي ورياض خليل البرهاوي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني:
riyadh.albarhawi@yahoo.com

أجريت دراسة لعزل وتشخيص بعض الفطور التي ترافق أعراض التبقع على أوراق وسوق نبات الكلغان *Silybum marianum* L.Gaerth قادرة على إفراز أنزيم السليلوليز. وقد تم تشخيص 12 عزلة فطرية تنتمي إلى ثلاثة أجناس وسبعة أنواع، وهي موزعة كما يلي: *Alternaria alternata* (عزلة واحدة)، *Aspergillus flavus* (4 عزلات)، *Aspergillus Fusarium solani* و *Fusarium oxysporum* (عزلة واحدة لكل منهما) و *A. niger*، *A. parasiticus*، *fumigatus* (3 عزلات). تم إجراء اختبار نوعي وكمي لبيان كفاءة هذه العزلات في إفراز أنزيم السليلوليز في أوساط زرع صلبة وسائلة.

F 35

دراسة التفاعل بين النبات الموديل *Medicago truncatula* والمسببات المرضية المحمولة في التربة ودور حمض الصفصاف في تنظيم الاستجابات الدفاعية في النبات. أنس خنشور، مونسيرات رامريزسورو وماريتينا ريكاور، المعهد الوطني للعلوم الزراعية، ENSAT، مختبر التقانات الحيوية وتحسين النبات، تولوز، فرنسا، البريد الإلكتروني:
anaskhanshour@yahoo.com

يعد *Medicago truncatula* نباتاً نموذجياً لدراسة النباتات البقولية، وهو عائل للعديد من الميكروبات الممرضة، كما أنه متعايش مع البكتيريا المثبتة للأزوت والفطور الجذرية/الميكوريزا. ومن أجل مقارنة تنظيم الاستجابات الدفاعية في كل من الحالة التعايشية والإراضية، قمنا بتوصيف النظام الإمبراضي لفطر *Fusarium oxysporum* f.sp. *medicaginis*، كأحد فطور التربة المسببة لمرض الذبول للعديد من الأنواع النباتية المزروعة، وذلك بإجراء العدوى على عدة سلالات من النبات *Medicago truncatula* (من بينها سلالة محلية سورية) باستخدام العديد من العزلات الفطرية المعزولة من نباتات بقولية مختلفة، من أجل تحديد التفاعلات التوافقية (المرض)، وعدم التوافقية (مقاومة النبات). وقد تم مؤخراً تحويل فطر *Fusarium oxysporum* f.sp. *medicaginis* باستخدام الجين الواسم المأخوذ من jellyfish والذي يشفر البروتين ذو التآلق الأخضر GFP، حيث استخدمت هذه السلالة لدراسة آلية حدوث العدوى بهذا الفطر على جذور سلالات أبدت صفة المقاومة (سلالة محلية سورية) وسلالات أخرى حساسة وذلك بواسطة المجهر ذو التآلق الضوئي، ومن أجل دراسة الاستجابات الدفاعية ودور حمض الصفصاف في تنظيمها تم تحويل نباتات *M. truncatula* باستخدام مورثة NahG والتي تشفر أنزيم salicylate hydroxylase، ولا تستطيع النباتات المحورة التي تنتج هذا الأنزيم مراكمة حمض الصفصاف، ونحن على وشك إيجاد البروتوكول المناسب لنباتات *M. truncatula* السلالة A17 والمعروفة بصعوبة تحويلها. وسوف تستخدم هذه النباتات في المستقبل لدراسة المقاومة والحساسية تجاه الفيوزاريوم وممرضات أخرى، وسوف تكون أداة جديدة لدراسة الدفاعات النباتية والمقاومة في العلاقات التفاعلية بين البقوليات والميكروبات.

F 36

تشميس التربة: طريقة فعالة في مكافحة مرض تفلن جذور البندورة/الطماطم المحمية في الساحل السوري. قصي الرحبة¹، سمير قدسية²، محمد أبو شعر² وطفة الإبراهيم¹. (1) الهيئة العامة للبحوث العلمية الزراعية، مركز بحوث اللاذقية، البريد الإلكتروني: qusay73@scs-net.org؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة حلب، حلب، سورية.

أجريت الدراسة حول مرض تفلن جذور البندورة/الطماطم المتسبب عن الفطر *Pyrenochaeta lycopersici* في البيوت البلاستيكية تحت ظروف الساحل السوري. واستخدمت طرائق مكافحة آمنة بيئياً (تشميس التربة، بقايا الملقوف، زرق الطيور، *Trichoderma harzianum*، *Bacillus subtilis*) خلال موسمي الزراعة 2002/2001 و 2003/2002. أظهرت النتائج كفاءة عالية لتشميس التربة تجلت في خفض درجة الإصابة بالفطر الممرض وفي عدد جسيماته الحجرية الحية المعزولة من التربة، وازداد نمو النبات وإنتاجيته بصورة معنوية، وبلغت نسبة الزيادة 78.16 و 61.30%، على التوالي. وكان لبقايا الملقوف وزرق الطيور دور داعم لفاعلية تشميس التربة وازداد نمو النبات، وبلغت نسبة الزيادة 88.87 و 86.08%، على التوالي، وازدادت إنتاجيته بنسبة وصلت إلى 65.74 و 69.05%، على التوالي. ولم يكن لزرق الطيور أو عوامل المكافحة الحيوية، مثل: *Bacillus subtilis* و *Trichoderma harzianum* تأثير معنوي في خفض درجة الإصابة أو زيادة نمو النبات وإنتاجيته.

التجربة باستخدام نباتات الجيل التاسع لسلاسل مرباة ذاتياً، كان قد حصل عليها بطريقة البذرة المفردة الناتجة من تهجين بين PAC2 و RHA266 وللسلاسلتين الأبويتين. وبناء على هذه الدراسة، أظهرت الأباء استجابات متباينة في المقاومة الجزئية للمرض، وحددت عدة مواقع مواصفات كمية (QTLs) بتأثيرات متوسطة لكل عزلة بناء على أعراض التماوت في الجذر والنتاج، كما لوحظت مواقع QTLs متطابقة في نفس المنطقة الوراثية المسؤولة عن المقاومة الجزئية للمرض في الجذر ونتاج النبات، وحددت عدة QTLs لتكون متخصصة لمسبب التكرز والتي يمكن أن تكون ذات أهمية لانتخاب صفة المقاومة لعزلة ما بمساعدة الواسمات، بالإضافة إلى أنها أداة لانتخاب النظائر المسيطرة على مقاومة النبات لعزلات مختلفة.

F 31

تحفيز عزلات الفطر *Alternaria solani* على إنتاج الأبواغ الكونيدية مختبرياً وتقويم مقدراتها الإمراضية. سلام عباس حسين العامري¹، ميسر مجيد جرجيس² وكامل سلمان جبر². (1) الهيئة العامة للبحوث الزراعية، وزارة الزراعة، بغداد، العراق، البريد الإلكتروني: salam_bbs@yahoo.com؛ (2) كلية الزراعة، جامعة بغداد، أبو غريب، العراق. يعد مرض اللفحة المبكرة في الطماطم/البندورة من الأمراض المهمة والشائعة في الكثير من مناطق العالم، إذ يصيب الأوراق وأعناقها والأفرع والثمار ويؤدي إلى تعفنها، وهو من العوامل المهمة المحددة للمحصول في الفصول الممطرة وفي الزراعة المحمية. لا ينتج الفطر المسبب للمرض أبواغاً كونيدية في الظروف المختبرية على الأوساط الصناعية إذ يحتاج إلى متطلبات عديدة لغرض تكوين هذه الأبواغ وقد تكون كمياتها قليلة. لذلك تم إجراء الدراسة بعد أن تم عزل الفطر من الحقل المصابة والتأكد من تعريفه. تم إجراء معاملات عديدة للحصول على الأبواغ الكونيدية وبكميات وافرة. تم تعريض مزرعة النظر النامية على الوسط Czapek dox agar والموضوعة على أوراق الطماطم/البندورة في طبق بتري يحوي وسط الأجار المائي وتعريضها إلى حرارة وإضاءة خاصة للحصول على الأبواغ. تم اختبار القدرة المرضية للأبواغ ومقارنتها مع الطرائق الشائعة في اختبار القدرة المرضية. وسيتم عرض النتائج مع المقارنة بين الطريقتين.

F 32

عزل وتشخيص بعض الفطريات المصاحبة لبذور أنواع معينة من القرعيات في محافظة السليمانية ومنطقة كرميان (العراق) وتأثير إفرزاتها في نسبة الإنبات. جلال حمه صالح إسماعيل بوسكاني، كلية الزراعة، جامعة السليمانية، السليمانية، العراق، البريد الإلكتروني: jalal_boskani@yahoo.com عزلت وشخصت فطريات عديدة من بذور بعض أنواع النباتات القرعية [أصناف محلية من القرع/الكوسا (*Cucurbita pepo* L.) والبطيخ الأصفر (*Cucumis melo* L.) والخيار (*Cucumis sativus* L.) والرقي/البطيخ الأحمر (*Citrullus lunatus* (Thumb) Mansf)] في منطقتي السليمانية وكرميان، العراق. والفطريات المعزولة من منطقة السليمانية هي: *Alternaria alternata*، *Aspergillus nidulans*، *A. niger*، *Fusarium oxysporum*، *Monilia* sp.، *Penicillium digitatum*، *Phytophthora* sp.، *Rhizoctonia* sp.، *Rhizopus stolonifer* و *Sterptomyces* sp. وبلغت نسب تكرار الفطريات المذكورة 0.28، 0.149 و 0.36 بالنسبة لبذور القرع والبطيخ الأصفر والخيار، على التوالي. بينما كانت الفطريات المعزولة من منطقة كرميان: *A. alternata*، *A. nidulans*، *P. digitatum*، *Rhizoctonia* sp. و *Ulocladium* sp. وبلغت نسب تكرار تلك الفطريات بالنسبة لبذور البطيخ الأصفر والقرع والرقي/البطيخ الأحمر 0.203، 0.35 و 0.9، على التوالي. أظهرت نتائج هذه الدراسة وجود اختلافات معنوية في تردد الفطريات وما بين المناطق التي جمعت منها أنواع البذور. وقد خفضت رشاحة مزارع فطريات محددة معدل إنبات البذور عند بعض الأصناف.

F 33

التصنيف العددي لأنواع الفطريات الممرضة العائدة للجنس *Alternaria* المعزولة من نباتات مختلفة في محافظة نينوى، العراق. ورفاء سعيد قاسم ورياض خليل البرهاوي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: riyadh.albarhawi@yahoo.com عزلت الفطريات التابعة للجنس *Alternaria* من عينات أوراق محاصيل شتوية وصيفية مصابة بتبقعات الأوراق (163 عزلة) من محافظة نينوى بالعراق، وشخصت إلى 11 نوعاً. انتخبت 70 عزلة لأعراض التصنيف العددي، وتمت دراسة الصفات الشكلية والفيزيائية للمزارع والصفات المجهرية للعزلات. استخدم التصنيف العددي بطريقة التحليل العنقودي وباستخدام المعدل الموزون، وحددت النسب المئوية للتشابه باستخدام معامل التشابه البسيط. وزعت العزلات في ضوء ذلك إلى 3 عناقيد رئيسية، و 28 عنقوداً ثانوية. اشتمل العنقود الرئيس الأول الأنواع التالية: *A. danthi*، *A. alternata*، *A. longipes*، *A. stat of pleopolar* و *A. tensinma* و *A. tenies*؛ واشتمل العنقود الرئيس الثاني الأنواع التالية: *A. brassicola*، *A. danthicola* و *A. cherinthe*؛ بينما اشتمل العنقود الرئيس الثالث على النوع *A. rancidi* فقط.

على حزم برويتينية عند الأوزان الجزئية التالية: 16، 23، 36، 52 كيلودالتون، ولقد اختلفت العزلات فيما بينها في محتواها من البروتينات ذات الوزن الجزئي المنخفض، فأعطت العزلات رقم 1، 4، 5، 7، 8، 9، 10 و 13 حزماً برويتينية عند وزن جزئي 17 كيلو دالتون بينما أعطت العزلات 2، 3، 6، 11، 12، 14 و 15 حزماً برويتينية عند وزن جزئي 20 كيلودالتون. أوضح التحليل الوراثي للحامض النووي الريبي المنقوص الأوكسجين (DNA) للعزلات المختبرة من خلال استخدام بسادى عشوائى وجود مجاميع مختلفة من القواعد النيتروجينية ذات وزن جزئي يتراوح ما بين 650 و 2500 زوج من القواعد، مما أدى إلى تقسيم العزلات المختبرة إلى 7 مجموعات، ولقد أعطت العزلات المختبرة حزماً عند الوزن الجزئي 2500 زوج من القواعد، فيما عدا العزلة رقم 7.

F 28

حصص العوائل النباتية البرية والمزروعة للجنس *Erysiphe* sp. (Ascomycetes: Erysiphaceae) في بعض مناطق الساحل السوري. غيداء يونس¹، نوال علي¹ ومحمد أحمد². (1) قسم النبات، كلية العلوم، جامعة تشرين؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: aiman-a@scs-net.org

تشكل فطريات البياض الدقيقي (Erysiphaceae) إحدى أهم المجموعات الفطرية، فهي تصيب العديد من النباتات البرية والمزروعة، كما تصيب عدداً هاماً من المحاصيل الزراعية الحقلية والخضرية، وكذلك الأشجار المثمرة ونباتات الزينة. بينت الدراسة الحقلية والمخبرية لبعض مناطق الساحل السوري خلال الفترة الزمنية ما بين أعوام 2000-2002 الانتشار الواسع للعوائل النباتية البرية والمزروعة للجنس *Erysiphe*، حيث سجلنا وجود (18) نوعاً لهذا الجنس، هي: *E. aquilegiae*، *E. artemisiae*، *E. betae*، *E. biocellata*، *E. buhrii*، *E. cichoracearum*، *E. convolvuli*، *E. cruciferarum*، *E. depressa*، *E. galeopsidis*، *E. galii*، *E. heraclei*، *E. knautiae*، *E. orontii*، *E. pisi*، *E. polygoni*، *E. punica* و *E. sordida*. وجدت الأنواع السابقة تتطفل على 107 أنواع نباتية برية ومزروعة تنتمي إلى 20 فصيلة نباتية، وقد كان 39 نوعاً من هذه الأنواع النباتية حاملاً للطورين الكونيدي والجنسي للفطر، بينما 68 نوعاً منها كانت حاملة للطور الكونيدي فقط. تم تحديد 14 نوعاً فطرياً بطوريه الكونيدي والجنسي معاً، و 4 أنواع بطورها الكونيدي فقط. تواجدت بعض الأنواع الفطرية على عدد كبير من الأنواع النباتية، كما هو الحال بالنسبة للنوع *E. cichoracearum* الذي سجل تواجده على 36 نوعاً نباتياً، النوع *E. pisi* على 16 عائلاً نباتياً، والنوع *E. cruciferarum* على 14 عائلاً نباتياً، بينما عدد قليل من الأنواع وجد على عائل نباتي وحيد مثل *E. galli* على نبات الغاليوم *Galium aparine* L. و *E. punica* على الرمان *Punica granatum* L.

F 29

تأثير قوام التربة في تعفن جذور وسوق نبات الفلفل/الفليفلة والطماطم/البندورة والبطاطا/البطاطس المتسبب عن فطريات الفيتوفتورا (*Phytophthora* spp.). عبد الهادي قشي¹ ومسعودة بن عبد القادر². (1) مخبر الميكروبيولوجيا وأمراض النبات، كلية العلوم، جامعة فرحات عباس، سطيف 9000، الجزائر؛ (2) قسم البيئة، كلية العلوم، جامعة جيجل، الجزائر، البريد الإلكتروني: yamina_messaouda@yahoo.fr

ينتشر مرض تعفن جذور وسوق بعض نباتات العائلة الباذنجانية (*Solanaceae*) (الفلفل الحلو والطماطم/البندورة والبطاطا/البطاطس) بكثرة في الجزائر سواء في البيوت البلاستيكية أو في الحقول، وهو يتسبب عن أنواع مختلفة من فطريات الفيتوفتورا (*Phytophthora* spp.) (*P. infestans*، *P. capsici*). يحدث إنبات الأبواغ عند أعناق (تاج) النباتات بوجود الرطوبة المرتفعة والحرارة المعتدلة. تظهر أعراض المرض بوضوح بعد 48 إلى 72 ساعة من حدوث الإصابة. ويؤثر قوام التربة في نسبة الإصابة، ولم تسجل الإصابة على كل الأنواع النباتية المختبرة إذا كان القوام رملياً، وتراوحت ما بين 50-80% إذا كان القوام طينياً خفيفاً، وما بين 20-30% إذا كان القوام متوازناً (مختلطاً). وكانت الفروقات معنوية ما بين متوسطات نسب الإصابة لمجموع النباتات بالنسبة لكل تربة، والتي بلغت 0% في التربة الرملية، 66.66% في التربة الطينية الخفيفة، و 23.33% في التربة المتوازنة.

F 30

التحليل الوراثي للمقاومة الجزئية لمرض تنكز جذر وتاج عباد الشمس الذي يحدثه فطر *Phoma macdonaldii*. تيسير أبو الفضل، سفورا بن محمد كيان، كركوري دشانكيم، لورا كينزبيتل وأحمد سرافي، مختبر التقانات الحيوية وتحسين النبات، ص.ب. 32607، كايسطاني، تولوز، فرنسا، البريد الإلكتروني: taissir@ensat.fr

هدف البحث لدراسة التحكم الوراثي بالمقاومة الجزئية لنباتات عباد الشمس إزاء عزلات من الفطر *Phoma macdonaldii* المسبب لمرض تنكز الجذر والتاج، وكذلك تحديد المناطق الوراثية المتعلقة بهذه المقاومة. أجريت

و 4 نباتات (الفصيلة النجيلية) و 3 نباتات لكل من (الفصيلة الصليبية والقرعية) ونباتين لكل من (الفصيلة البقولية والخبازية والحماضية والوردية) ونباتاً واحداً لكل من الفصائل التالية (العلقية) *Convolvulaceae* و *Dipsacaceae* والزانبية *Fagaceae* والتوتية *Moraceae* والبنية *Rubiaceae* والفربينية *Verbinaceae* والعنبية *Vitaceae*. تراوحت شدة الإصابة على النباتات المصابة بين شديدة (17 نباتاً) ومتوسطة (26 نباتاً) وضعيفة (3 نباتات). وجدت الأبواغ الكونيدية على أحد سطحي الورقة أو كليهما وعلى السوق والبراعم والأزهار والثمار حسب النباتات المصابة. كما تواجدت الأجسام الثمرية على 15 نباتاً وتركزت على السطح العلوي ويلبها السطح السفلي ثم السوق والأزهار. ظهرت الكونيدات والحوامل الكونيدية عند الفحص المجهرى شفاقة وتباين شكل الكونيدات بين أسطوانية وبيضوية وبرميلية وصولجانية وتراوحت أبعادها بين 10.7×22.5 ميكروناً للفطر *Erysiphe graminis* و 13.5×57.3 ميكروناً للفطر *E. cichoracearum*. كما ظهرت الحوامل الكونيدية متباينة في الطول فقد تكون قصيرة يصل طولها إلى 52 ميكروناً أو طويلة تصل إلى 135.6 مايكروناً. أما الأجسام الثمرية فكانت من النوع المغلق كروية أو بيضوية وكان معدل أقطارها 68.5 ميكروناً للفطر *E. cichoracearum* و 209.2 ميكروناً للفطر *Phyllactinia* sp. كما وجد 21 نباتاً مصاباً سجلت لأول مرة في العراق كعوائل جديدة لفطريات البيض الدقيقي منها 12 نباتاً يعود للفصيلة المركبة و 3 نباتات للفصيلة الخيمية وتوزعت بقية النباتات على الفصائل الأخرى. وحدد الفطر *Sphaerotheca cephalarii* كمسبب لمرض البياض الدقيقي على نبات الزيوان الأسود والفطر *Phyllactinia* sp. على نبات الختمية لأول مرة في العراق.

F 25

عزل وتشخيص الفطور المنتجة لأنزيم لبياز المصاحبة لبذور السمسم. فاتن نوري ملا عبد حسين الرفاعي، قسم علوم الحياة، كلية العلوم، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: fatennm04@yahoo.com
أجريت الدراسة بهدف البحث عن الفطور المصاحبة لبذور السمسم المنتجة لأنزيم اللايباز. تم الحصول على 40 عزلة مختلفة من الفطريات المعزولة من البذور المأخوذة من محافظات بغداد وصلاح الدين وبابل والتأميم والأنبار ونيوى. واختلفت نسبة عزل الفطور من البذور باختلاف المناطق وكانت 22% و 20% لأنواع *Rhizopus stolonifer* و *Aspergillus niger*، على التوالي في محافظة نينوى، يليهما الفطر *Alternaria sesami* (14%) المعزول من محافظة الأنبار. تم إجراء اختبار نوعي لمعرفة قابلية هذه العزلات على إنتاج إنزيم اللايباز في الأوساط الصلبة وكذلك لمعرفة أفضل العزلات المنتجة لهذا الإنزيم. وكان لجميع العزلات نشاطاً موجباً في إنتاج الإنزيم عدا الفطر *Rhizoctonia solani* والفطر *Fusarium* spp. المعزولين من بذور السمسم في محافظتي بغداد وبابل، على التوالي.

F 26

مرض تعفن جذور نبات العنكبوت *Chlorophytum comosum* ومكافحته كيميائياً. خالد حسن طه ونبيل عزيز قاسم وعمار عمر الأطرقي، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com

لوحظ على نباتات العنكبوت *Chlorophytum comosum* المزروعة في المظلات الخشبية والدفينة البلاستيكية والزجاجية في مناطق متفرقة من محافظة نينوى حالات موت الأوراق والباليل للنباتات الكبيرة يصاحبها تقزم واضح للنبات. وجد أن المسبب يعود إلى نوعين من فطريات تعفنات الجذور وهي: *Fusarium solani* (Mart.) sacc و *Rhizoctonia solani*، ويعد هذا أول تسجيل للمرض في العراق. وتم اختبار حساسية أصنافه الثلاثة المعروفة عالمياً والمزروعة في العراق حيث وجد أن *Chlorophytum comosum* Phylangim أشد حساسية من *Chlorophytum comosum variegatum* في حين كن الصنف *vitatum* مقاوم للمرض. وأختبرت بعض المبيدات لمقاومة المرض فأثبتت مبيدات الهوماي Homi والبينوميل Benomyl والفيثافاكس - ثيرام Vitavax كفاءة عالية في مكافحة المرض عند استخدامها سقياً للتربة بتركيز 0.1%.

F 27

الاختلافات الجزيئية للعزلات الأوروبية والمصرية للفطر *Sclerotium cepivorum* مسبب مرض التعفن الأبيض في البصل. نشوى محمد عاطف سلام، محمد حسن عبد الرحيم حسن وعبد الرزاق عبد العليم عبدالرازق، قسم أمراض النبات، كلية الزراعة، جامعة أسيوط، مصر، البريد الإلكتروني: mhasan@aun.edu.eg، amnsallam@yahoo.com
استطاعت العزلات الأوروبية والمصرية للفطر *S. cepivorum* مسبب مرض التعفن الأبيض إصابة صنف البصل جيزا 6 بدرجات متباينة الشدة، تراوحت ما بين الشديدة والضعيفة. أظهرت الطرز الحزمية لأنزيم إستيريز للعزلات المختبرة باستخدام جهاز الرحلان الكهربائي أن جميع العزلات تحتوى على حزمتين من مشابهاة الإستيريز بينما اختلفت العزلات المختبرة فيما بينها في درجة كثافتها. أظهر التحليل البروتيني للعزلات المختبرة باستخدام جهاز الرحلان الكهربائي أنها تحتوى

بين فطريات المجموعة الواحدة، في حين كان ضعيفا أو سالبا بين فطريات المجموعتين. وتدل هذه النتيجة على احتمال وجود فطريات تخصص في إصابة بذور أصناف بعينها. كما يستخدم الإنحدار المتعدد المراحل لوصف العلاقة بين فطريات البذرة (متغيرات مستقلة) والمتغيرات المستعملة لوصف المرض (متغيرات تابعة). أظهرت نماذج الإنحدار الأربعة التي أمكن التوصل إليها أن الجانب الأكبر من التباين في المتغيرات المستعملة لوصف المرض من الممكن أن يعزى إلى تأثير فطريات *F. semitectum*، *N. oryzae*، *R. solani*، *R. stolonifer* و *Trichoderma spp.* والجدير بالذكر أنه لم يمكن التوصل إلى أي نموذج إنحدار لوصف العلاقة بين فطريات البذور وحدث موت البادرات بعد ظهورها فوق سطح التربة.

F 22

دراسة الفطر (*Phoma macdonaldii*) بواسطة تقنية GFP على نباتات عباد الشمس. تيسير أبو الفضل¹، ألين جينو²، ميشيل بيتيري¹، مارتينا ريكاور¹، ايف مارتينيز²، ريزا دافيشزاد¹، كروكوري ديشينكيوم¹. (1) مخبر التقانات الحيوية النباتية (ENSAT)، تولوز، فرنسا، البريد الإلكتروني: tafadil@yahoo.com، taissir@ensat.fr؛ (2) مركز البحوث النباتية (IFR)، كاستاني، فرنسا.

تعد تقنية البروتين الأخضر المومض (Green Fluorescent Protein) (GFP) والتي تعتمد على البروتين المشع المنتج من قبل الفطور أو البكتيريا المحورة وراثيا، من أفضل الطرق المستخدمة لدراسة استعمار الكائنات الحية الدقيقة الممرضة للعائل. واستخدمنا هذه التقنية لدراسة التفاعل بين نبات عباد الشمس (*Helianthus annuus*) وفطر *Phoma macdonaldii* الذي يسبب مرض الساق الأسود، وتظهر أعراضه على الساق وعنق الجذر على هيئة موت/نكرزة؛ ويسبب هذا المرض خسائر كبيرة على مستوى العالم. وقمنا لأول مرة عالميا بالحصول على عزلات فطرية محورة وراثيا تحمل مورث GFP بواسطة (*Agrobacterium tumefaciens*)، وباستخدام حاث تكوييني، إذ تم انتقاء هذه العزلات على وسط (*hygromycine*) والحصول على 18 عزلة بطريقة البوغ المفرد. انتخبت عزلة واحدة، بالاستناد إلى إختبار القدرة الإمراضية، وأعدت بها سلالتان من نباتات عباد الشمس احدهما عالية القابلية للإصابة والأخرى متحملة. بعد ذلك تمت دراسة استعمار أنسجة الجذر والساق. وقد بينت النتائج التي وضحتها المجهر الإلكتروني والمجهر الليزر الكانس (*confocal laser scanning*) بالإضافة للتحليل الكمي، فروقا معنوية في آلية عبور الفطر واستعمار له للنسج، وتطور المرض، بين السلالتين المدروستين من نبات عباد الشمس.

F 23

امتصاص المادة المغذية بواسطة هيفات الفطر *Phytophthora infestans* في المختبر. نجاة خليفة الغرياني¹ وبيتر بنسر فيليب². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، ليبيا، البريد الإلكتروني: a3aia@hotmail.com؛ (2) قسم علوم الحياة، جامعة غرب إنجلترا، بريطانيا.

ابتكر نظام لقياس تراكم السكريات المشعة C^{14} بحساب التآلق. وكان امتصاص العلامة المميزة التي جمعت في هيفات الفطر *Phytophthora infestans* من الغلوكوز أكبر بصورة معنوية مقارنة مع الفركتوز والسكروز. وكان تقريبا 60% من العلامة المميزة في هيفات الفطر *P. infestans* قد حول إلى مكونات الإيثانول عديمة الذوبان. وأعاق المثبطان Carbonylcyanide-m-chlorophenylhydrazone (CCCP) و *P*-chloro-mercuribenzenesulphonic acid (PCMB) امتصاص العلامة المميزة من الغلوكوز بمقدار 55.3 و 78.1%، على التوالي، بينما منع أما النيجيريسين والفيزيتين امتصاص العلامة المميزة بمقدار 15.9 و 78.7%، على التوالي. وكان امتصاص العلامة المميزة من مشابه الغلوكوز 2-deoxy-D-glucose التي جمعت في هيفات الفطر *P. infestans* أقل من الغلوكوز (63%)، وكان C^{14} قد امتص من 3-O-methylglucose بدرجة أكبر من الغلوكوز (132%). أزلت المعالجة بالإيثانول بصورة كلية تقريبا العلامة المميزة التي جمعت بواسطة هيفات الفطر من 2-deoxy-D-glucose، مع افتراض بقاء كل القابل للذوبان في سيتوبلازم هيفات الفطر. وثبط الأزيد امتصاص كل السكريات بصورة معنوية.

F 24

دراسة أمراض البياض الدقيقي في حقول محافظات شمال العراق. رمضان يوسف الكوراني ونديم أحمد رمضان، قسم علوم الحياة، كلية العلوم، جامعة الموصل، العراق، البريد الإلكتروني: ramadhngoran@yahoo.com
أجري المسح الحقل للنباتات الموجودة في مناطق معينة من محافظات نينوى وأربيل ودهوك، وشملت الدراسة النباتات البرية والمحاصيل الحقلية والأشجار والشجيرات والخضراوات ونباتات الزينة وضمت 103 نباتا منها 34 نوعا من النباتات البرية و32 نوعا من الأشجار والشجيرات و23 نوعا من الخضراوات و9 أنواع من المحاصيل الحقلية و5 من نباتات الزينة. أصيب 46 نوعا بمرض البياض الدقيقي منها 16 نبات يعود إلى العائلة المركبة و5 نباتات (الفصيلة الخيمية)

F 20

دراسة أولية عن مدى انتشار الظواهر المرضية على النخيل في العراق. اسماعيل ابراهيم الياسري، أحمد زهير اسماعيل وأسيل عبد الرزاق محمد، الهيئة العامة لوقاية المزروعات، أبو غريب، بغداد، العراق، البريد الإلكتروني: ismail_alyaseri@yahoo.com

تم تنفيذ الدراسة في النصف الثاني من عام 2005 وذلك من خلال اجراء مسح شامل لعموم بساتين النخيل في العراق موزعة في 13 محافظة (البصرة، ميسان، ذي قار، الديوانية، السماوة، بابل، كربلاء، النجف، واسط، بغداد، ديالى، صلاح الدين والأنبار). وهدفت الدراسة إلى التقصي عن مدى انتشار الظواهر المرضية في بساتين النخيل في العراق وتعريف مسبباتها. تبين من نتائج الدراسة أن المعدل العام لنسبة انتشار الظواهر المرضية هو 8.56%، وظهرت في محافظة كربلاء أعلى نسبة للإصابة (35.41%)، وتلتها محافظة ذي قار (32.5%) ثم محافظة صلاح الدين (26.27%) وبعدها محافظة بابل (25.9%)، وتبعتها بقية المحافظات. تضمنت أعراض الإصابة حالات متعددة منها 34.7% تحمل علامات تشوه السعف، و74.6% جفاف السعف، و28.4% جفاف القمة، و29.6% إنحاء القمة و42.4% حالات أخرى تضم خياس طلع النخيل والحفارات والحميرة والدوباس والأرضة وغيرها. كان مستوى الخدمة رديناً عند بعض بساتين النخيل (23.8%) وجيدا عند 64.7% وجيد جدا عند 10.3% وممتاز عند 1.2%. بلغت الفئات العمرية لأشجار النخيل عند 20-30 سنة أعلى نسبة (18.14%)، ثم الفئات 30-40 سنة (16.05%) وتلتها الفئات 10-20 سنة (14.6%) وتبعها الفئات الأخرى. بلغت نسبة البساتين المكافحة 50% من إجمالي البساتين التي شملها المسح توزعت على السنوات من التسعينات وحتى عام 2005. وكانت أعلى نسبة للبساتين المكافحة في عام 2002 إذ بلغت 22.2%، بينما كانت النسبة العامة للبساتين غير المكافحة نهائياً هي 50%. ومن خلال توزيع الإصابة على الأصناف التي شملتها الدراسة تبين ان الصنف زهدي يمثل 38.73% من حالات الإصابة في البساتين، يليه الصنف خضراوي بنسبة 17.8% ثم الصنف أسطة عمران (عمراني) بنسبة 12.4% والصنف خستاوي بنسبة 7.17%، وبعد ذلك تأتي بقية الأصناف تباعاً. وتبين من خلال العزل والتشخيص للمسببات المرضية تكرار وجود الفطريات *Thialoviopsis paradoxa* بنوعه العادي والعنقودي وأنواع من الفطر *Fusarium* كان أهمها الفطر *Fusarium solani* المسؤول عن الذبول الفيوزارمي الذي يبدأ باصفار تدريجي لسعف النخيل وينتهي بجفاف السعف وجفاف القمة وموت النخلة خلال مدة قصيرة.

F 21

فطريات بذرة القطن وتأثيرها في حدوث موت البادرات. علي عبد الهادي علي، محمود توفيق محمود منصور، إبراهيم حافظ العباسي، عبد الفتاح عبد الحميد الوكيل وشوقي محمد المتولي زايد، معهد بحوث أمراض النباتات، مركز البحوث الزراعية، 9 شارع الجامعة، الجيزة، مصر، البريد الإلكتروني: Brhoomelabasi_57@yahoo.com

أظهر التقدير النوعي للفطريات المعزولة من بذور ثمانية من أصناف القطن المصرية التجارية، سواء بعد تعقيم البذرة سطحياً أو بدون تعقيمها، وجود الفطريات التالية: *Alternaria alternata*، *Aspergillus flavus* و *Aspergillus niger* (71%)، *Aspergillus spp.*، *Cephalosporium sp.* و *Cladosporium sp.* (25.63%)، *Drechslera spp.*، *Nigrospora oryzae*، *Penicillium spp.*، *Fusarium moniliforme*، *F. oxysporum*، *F. semitectum*، *F. solani* و *Fusarium sp.* (34%)، *Rhizopus stolonifer*، *Rhizoctonia solani*، *Trichoderma spp.* و *Trichothecium roseum* أما الفطريات الأخرى فقد تراوح ترددها ما بين 0.13-22.5%. أدى التعقيم السطحي للبذرة إلى حدوث انخفاض معنوي عند تحليل النباين أن كل من الصنف وكذلك تأثر صنف × معاملة شكلت مصادر معنوية أو عالية المعنوية للنتاين في تردد الفطريات المعزولة باستثناء فطر *F. oxysporum*. احتل الصنف المرتبة الأولى في الأهمية كمصدر لهذا النتاين في عزل ستة من الفطريات (40%)، في حين احتل تأثر صنف × معاملة المرتبة الأولى في الأهمية كمصدر للنتاين في عزل خمسة من الفطريات (33.33%). وكان أكبر عدد من الفطريات (14 فطر) أمكن عزلها من صنف جيزة 70، أما أقلها (9 فطريات) فقد أمكن عزله من جيزة 85. أظهرت الدراسة الحالية بشكل واضح الدور الذي تلعبه فطريات البذرة كمسببات لمرض موت البادرات في مرحلة ما قبل ظهور البادرات فوق سطح التربة، مقارنة بمرحلة ما بعد ظهور البادرات فوق سطح التربة. وأظهر معامل ارتباط بيرسون لتقييم درجة الارتباط بين 153 زوج من الفطريات المعزولة، وجود ارتباط معنوي بين 11 زوجاً من الفطريات (7.19%)، تسعة منها موجبا وزوجان ارتباطهما سالبا. وأمكن باستعمال التحليل العنقودي تقسيم الفطريات المعزولة إلى مجموعتين محددين، شملت المجموعة الأولى على *A. niger*، *A. alternata*، *F. solani*، *F. semitectum*، *Penicillium spp.* و *Trichoderma spp.*، في حين اشتملت المجموعة الثانية على فطريات *A. flavus*، *Cephalosporium sp.*، *Cladosporium sp.*، *Drechslera spp.*، *Fusarium sp.*، *F. moniliforme*، *F. oxysporum*، *F. semitectum*، *F. solani*، *N. oryzae*، *R. stolonifer*، *R. solani* و *T. roseum*. وكان الارتباط قوياً وموجبا

إظهار علامات التقرح واللفحة النموذجية بشكل يفوق تأثير جميع الفطور الأخرى المختبرة وبذلك يعتبر هذا الفطر مسبب لمرض التقرح ولفحة الفروع على الأوكاليتوس في شمال سورية. وهذا أول تسجيل للمرض في شمال سورية.

F 17

مرض عفن القلب (Heart rot) على أصناف نخيل التمر بالساحل الليبي. عواطف محمد الرياني¹، نجاة خليفة الغرياني² والزرروق أحمد الدنقلي². (1) جهاز تنمية وتطوير النخيل والزيتون، ليبيا؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، ليبيا، البريد الإلكتروني: a3aia@hotmail.com

أجريت زيارات ميدانية لـ 62 مزرعة من مزارع النخيل في 23 منطقة من الساحل الليبي خلال موسم 2005/2004. بواقع 2-4 مزارع لكل منطقة بهدف دراسة انتشار مرض عفن القلب على أصناف نخيل التمر المختلفة. دلت النتائج على أن المرض متواجد بمنطقة زيتن يليها مصراته وتاورغاء والخمس والزاوية وصرمان. كما دلت النتائج أن صنف البكراري أكثر الأصناف عرضة للإصابة يليه الطابوني وحلاوي وفزاني وعامي. الفسائل الصغيرة أكثر تعرضاً للإصابة في العمر الأول والأحجام الصغيرة المتعرضة للرطوبة العالية. كما لوحظ أن الإصابة عالية بالمناطق المروية بالرّي الرزادي. أعراض المرض تمثلت في تلون الأوراق في القمم النامية بشكل مبيض يتحول إلى اللون البني مصحوباً بتقصّف الوريقات مع توقف نمو الفسيلة منتهاً بتعفن القلب وموت الفسائل في أغلب الحالات. ومن خلال العزل المعملّي للعينات المجمعة عرف الفطر *Thielaviopsis paradoxa* كمتلازم مع أعراض الإصابة.

F 18

الانتشار الحالي لمرض البيوض على نخيل التمر في شمال إفريقيا وملاحظات حول خصائصه وتشخيصه. مولاي الحسن سدرة، مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، مراکش، المغرب، البريد الإلكتروني: sedramh@hotmail.com، sedramh@menara.ma، mhersedra@yahoo.fr

يعدّ مرض البيوض من أخطر الأمراض في العالم التي تصعب مكافحتها، ويسبب خسائر وأضرار جسيمة في بعض دول شمال إفريقيا ويهدد بشكل مستمر الدول المجاورة والمنتجة للتمر. إن تنوع الحالات الصحية في هذه البلدان يوحي بتنوع واختلاف في استراتيجيات مكافحة هذا المرض. تبعاً للمعاينات الحقلية والمخبرية المتعددة يسبب المرض أعراضاً على النخيل نموذجية وغير نموذجية، كما يحدث في بعض الحالات اختلاطات مع أعراض أمراض أخرى تصيب النخيل. ويفرز الفطر الممرض مواد سامة خاصة تميزه عن السلالات الأخرى من الجنس نفسه. على الرغم من وجود اختلاف في مصادر عزلات الفطر وأشكال مستعمراتها/مزارعها وبصماتها الجزيئية، فإنها تبدي قدرات إعدائية متباينة على نباتات النخيل. وتشير أيضاً إلى هذا التنوع كل الدراسات الخاصة بسلالات الفطر المعزولة من نخيل التمر ونخيل الزينة والنباتات العوائل الحاملة للفطر لكن بدون أعراض. وهذا يطرح بعض التساؤلات عن مصدر أو مصادر المرض ويفتح آفاق بحوث هادفة.

F 19

دراسة مرض تبقع أوراق نخيل التمر بالبصرة في العراق وعلاقة عمر النخلة ومحتوى الأوراق من الشمع بالإصابة. محمد عامر فياض وعلاء عودة مانع، قسم وقاية النبات، كلية الزراعة، جامعة البصرة، العراق، البريد الإلكتروني: m_a_fayadh@yahoo.com

أجريت هذه الدراسة في كلية الزراعة بجامعة البصرة وتضمنت تقدير شدة الإصابة بمرض تبقع أوراق النخيل على أصناف مختلفة من نخيل التمر (البرحي، البريم، الحلاوي، السائر، الزهدي والخضراوي) في ثلاث مناطق من محافظة البصرة (أبي الخصيب وشط العرب والهارثة). أظهرت نتائج المسح بأن أعلى شدة إصابة سجلت في منطقة شط العرب (37.33%) وأقلها في منطقة أبو الخصيب (32.66%). كما سجلت أعلى شدة إصابة على صنف الزهدي في منطقة شط العرب (44%). وبينت النتائج أن شدة الإصابة تتناسب طردياً مع عمر النخيل، إذ بلغ أقل معدل لها عند عمر عشر سنوات وأعلى معدل لها عند عمر 30 سنة. كما عزلت العديد من الفطور المرافقة لأعراض المرض، وعند إختبار قدرتها الإمراضية تمكنت الفطور التالية من إحداث التبقعات الورقية: *Cladosporium*، *Bipolaris australiensis*، *Alternaria alternata*، *Thielaviopsis* و *Phoma glomerata*، *Phoma leveillei*، *Fusarium solani*، *Fusarium oxysporum herbarum* و *P. glomerata*، *F. solani*، *F. oxysporum*، *B. australiensis*، *A. alternata*، *paradoxa*. ويعد هذا أول تسجيل للفطور *P. leveillei* و *Phoma glomerata* كمسببات لمرض تبقع أوراق النخيل في العراق. وثبط مستخلص أوراق أصناف الخضراوي والبرحي نمو مستعمرات الفطور الممرضة إلى 2.8 و 2.9 سم، على التوالي، في حين مستخلص أوراق صنف السائر والزهدي زادت من نشاط مستعمرات الفطور إلى 5.4 سم، مقارنة مع 3.4 سم لمعاملة الشاهد. كما وجدت علاقة ارتباط سلبية بين محتوى الأصناف من التانينات والشمع وشدة الإصابة.

A. alliaceus، *A. tamari*، *A. terreus*، *A. unguis* و *A. wentii*، خمسة منها معروفة سابقاً وخمسة تسجل لأول مرة هي: *A. alliaceus*، *A. candidus*، *A. unguis*، *A. niveus* و *A. wentii*. وتم استخدام المورثات المستهدفة *omtB* و *aflJ*، *aflR* على أنه لم يكن بالإمكان تضخيم البادىء *omtB* الذي استخدمه Yu (2000)، سابقاً وتم تكوين بادىء جديد هو *omtBII*. وتمكن هذا البادىء من تضخيم كل العزلات المنتجة للأفلاتوكسينات في هذه الدراسة. وأعطى هذا البادىء ذات النتائج التي حصل عليها بكموماتوغرافيا الطبقة الرقيقة، وعليه فهو واسم مناسب لكشف العزلات المنتجة للأفلاتوكسينات. أوضح استخدام مادة methylated β -cyclodextrin في مستنبت النمو أنه بالإمكان استخدامها كطريقة سريعة لكشف الفطور المنتجة للأفلاتوكسينات. ونظراً للطبيعة غير المعروفة لإنتاج الأفلاتوكسينات في حالات مختلفة، فإن بادئات PCR المحددة هي طريقة يعتد بها لكشف العزلات المنتجة للأفلاتوكسينات

F 15

أول عزل وتنمية الفطر والطحلب المكونين للأشن *Xanthoria parietina* الذي يصيب أشجار المانجو في مصر. علي محمد كريم، معهد الكفاية الانتاجية، جامعة الزقازيق، مصر.

يعتبر الأشن (الليكن) *Xanthoria parietina* أكثر الأشنات تواجداً على أشجار المانجو في مصر خاصة تلك الموجودة بالحدايق غير المعتى بها. إن التأثير الضار الذي تسببه الأشنات النامية على الأشجار كأحد مسببات الأمراض النباتية قد ثبت بالفعل من خلال البحوث التي أجريت في السنوات القليلة الماضية. في هذا البحث تم عزل وتنمية الفطر والطحلب المكونين للأشن *Xanthoria parietina* لأول مرة في مصر بهدف خلق المزيد من الاهتمام بدراسة الأشنات مقارنة مع ما لاقته من قبل. استخدمت عدة طرق لعزل كل من الفطر والطحلب ووجد أن أفضل الطرق لعزل الفطر كانت بعزل الأبواغ النابتة والمنتشرة من الجسم الثمري على سطح بيئة الأجار العادي، بينما طريقة الماصة الدقيقة كانت أدق الطرق لعزل الطحلب. استخدمت أيضاً عدة بيئات لتنمية الفطر والطحلب المعزولين ووجد أن بيئة مستخلص التربة تليها بيئة ليللي وبارنيت كانت أفضل البيئات لنمو الفطر. بينما أفضل نمو للطحلب وجد على بيئة بولنز مضافاً إليها مستخلص فروع المانجو يليها بيئة بولنز المضاف إليها البريتوز بيتون. تم دراسة بعض العوامل التي تؤثر في إنبات الأبواغ وكذلك معدل نمو الفطر والطحلب مثل درجة الحرارة ودرجة الحموضة وشدة الإضاءة.

F 16

حصر وتعريف المايكوفلورا لبعض الحالات المرضية التي تعترى الغراس وأشجار الحراج والأوكاليبتوس في شمال سورية. مصطفى بلال و مازن بلال، مركز بلال التخصصي لوقاية المزروعات، الحميدية، السيد علي، قاسيون، ص.ب. 10444، حلب، سورية.

ظهرت في أعوام 1989 حتى 2002 أعراض مرضية محددة على غراس وشجيرات وأشجار الحراج والأوكاليبتوس المزروعة في مشاتل الحراج الإصطناعية في مواقع مختلفة من محافظات حلب، اللاذقية وادلب، وعلى جانبي الطرق العامة في محافظات حلب، ادلب، اللاذقية، الحسكة (القامشلي) وحماة. وقد تمثلت هذه الأعراض بشحوب وإصفار وتبقعات في الأوراق تحولت إلى لفحة وموت تراجمي للفروع والفريعات، ونالت 10-25% من الغراس والأشجار والشجيرات. أظهرت نتائج العزل المخبري ودراسة السمات المظهرية للمستعمرات والقدرة الإمراضية لبعض الكائنات المعزولة بالإضافة إلى دراسة الأبعاد البيومترية للوحدات التكاثرية اشتراك 48 جنساً فطرياً في إحداثيات مختلف الأعراض المرضية على 52 جنساً حراجياً ينتمون إلى 38 فصيلة (عائلة) نباتية مختلفة. وكانت الفطور الرئيسية المعزولة ونسبة إصابتها للأجناس الحراجية كما يلي: فطر *Coniothyrium* (86.15%)، *Mycosphaerella* (52.13%)، *Alternaria* و *Sphaeropsis (Diplodia)* (74.69% لكل منها)، *Cytospora* (40%)، *Pestalotiopsis* (38.46%)، *Phoma* (33.85%)، *Hendersonia* (32.31%)، *Pleospora* (30.77%)، *Gloeosporium* (27.69%)، *Teichospora* (20%)، *Cladosporium* (16.92%)، *Cylindrosporium* (15.38%)، *Macrophomina (Rhizoctonia bataticola)* و *Ascochyta* وفطر *Stagonospora* (12.31% لكل منهم)، *Stemphylium* و *Colletotrichum* (9.23% لكل واحد منهما)، *Aureobasidium* (7.69%)، *Oidiopsis* و *Oidium* (6.15% لكل واحد منهما). أما الـ 25 جنساً أخرى فتراوحت نسبة إصابتها ما بين 1.54-7.69%. كما اشتراك 13 جنساً فطرياً في إحداثيات مختلف الأعراض المرضية على غراس وأشجار الأوكاليبتوس، فأعراض التبقع تسببها أجناس الفطور *Alternaria*، *Ascochyta*، *Cladosporium*، *Cercospora*، *Pestalotiopsis*، ولفحة السوق والفروع *Coniothyrium* ويشاركه الفطور *Hendersonia*، *Mycosphaerella*، *Phoma* و *Seiridium (Coryneum)*. وقد بينت دراسة القدرة الإمراضية للفطور الرئيسية المعزولة أن فطر *Coniothyrium* له قدرة كبيرة على

F 12

دراسة تنوع مجتمعات الفطر *Alternaria*، مسببات أمراض الحمضيات/الموالح في شمال إيران اعتماداً على الصفات الشكلية ونماذج البروتين بالرحلان الكهربائي. س. ف. الأفي¹، أ. أ. ديهبوري² و أ. مجد³. (1) أمراض وأفات النباتات، مركز البحوث الزراعية في مازانداران؛ (2) قسم علم الحياة، جامعة آزاد الإسلامية في غايمشاهر؛ (3) قسم علم الحياة، جامعة آزاد الإسلامية في شمال، طهران، إيران، البريد الإلكتروني: alavi_v@yahoo.com

تسبب أنواع الفطر *Alternaria* أربعة أمراض متميزة على الحمضيات/الموالح، تدعى: البقعة الورقية للألترناريا على الليمون الخشن، فشل المانشا على الليمون المكسيكي، العفن الأسود الألترناري على الثمار، والبقعة البنية على المندرين والهجن، يتواجد المرضين الأخيرين في شمال إيران. نفذت عملية جمع عينات من أشجار الحمضيات/الموالح التي أبدت أعراض العفن الأسود على البرتقال نافل، والبقعة البنية على المندرين من بيارات مختلفة في مازانداران عامي 2003 و2004. عزلت مزارع الفطر *Alternaria* من العينات، ونقيت باستخدام مستنبت بطاطا دكستروز أغار (PDA). وكانت ألوان مزارع الفطر على المستنبت الغذائي PDA مختلفة، لكن لون الأبواغ وعرض الخيط الفطري كان متشابهاً. وكانت أحجام الأبواغ المأخوذة من عزلات الثمار أكبر (13 X 28 ميكروميتر) بالمقارنة مع العزلات الأخرى. نفذ اختبار دوديسيل كبريتات الصوديوم على هلام البولي الأكريلاميد بواسطة الرحلان الكهربائي، وتم تحليل حزم البروتين باستخدام نظام spss/pc المخبري 200. لم تلاحظ اختلافات معنوية بين أعداد حزم البروتين ومكان عزلات الفطر *Alternaria* باستثناء عزلات ثمار الصناديق التي امتازت بتكوين حزم أعظمية (أكبر) على الهلام. وكانت كل عزلات الفطر *Alternaria* المتحصل عليها متماثلة، وهي تتبع النوع *A. alternata* اعتماداً على الصفات الشكلية، ومن المحتمل تمييزها إلى تحت أنواع اعتماداً على قدرتها المرضية والمدى العوائلي. وكانت عزلات الثمار مختلفة ويحتمل انتمؤها إلى أنواع أخرى.

F 13

المسبب الفطري لمرض الموت التراجعي على العنب في الأردن. أحمد محمد المومني، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: momanyah@ju.edu.jo

أصبحت ظاهرة موت الأفرع في العنب مألوفة في الأردن وخاصة في المزارع المسنة. أجريت هذه الدراسة في موسمي 2001 و2002 على الأشجار المصابة بالعدوى الطبيعية بحيث تم اختيار 29 مزرعة عشوائياً بعمر أكبر من 7 سنوات بمحافظة عجلون. بدأت الأعراض أكثر وضوحاً خلال شهر آذار/مارس عندما بلغ طول النموات الجديدة من 15-20 سم بصورة تشوه في الأوراق وبلون مصفر وذات حواف ممزقة وأصغر من الأوراق السليمة. واحتوت القطوف على حبات عنب صغيرة وأخرى كبيرة وغير متجانسة النضج. وعند أخذ قطاع عرضي في الفرع المصاب ظهر تلون بني في الخشب على شكل إسفين يبدأ من مركز الفرع وقاعدته باتجاه السطح. يتسبب المرض عن الفطر *Eutypa maura* ويتبع للفطريات الأسكية حيث يكون أجساماً ثمرية دورقية كما تم عزله مخبرياً وسجل ظهور الأبواغ الأسكية لهذا الفطر لأول مرة في الأردن بشكل خاص وفي المنطقة العربية بشكل عام. يظهر الفطر على الوسط الصناعي بشكل مستعمرات بيضاء اللون وعند تعريضها للضوء والظلام لمدة 12 ساعة، على التوالي تكونت أبواغ كونيديية بلغ طولها 18-45 وعرضها 0.8-1.5 ميكروناً. لم تتكون الأجسام الثمرية الدورقية إطلاقاً على الوسط الصناعي في حين تكونت على الأفرع المقلمة المتبقية من موسم التقليم السابق والمتروكة في الحقل. ويحتوي الجسم الثمري على عدد كبير من الأكياس الأسكية وكانت الأبواغ الأسكية هلالية الشكل وبرتقالية إلى شفافة اللون ويطول 12 وعرض 3 ميكرون.

F 14

كشف الأفلاتوكسين في أنواع الفطر *Aspergillus* المعزولة من ثمار الفستق الحلبي في إيران. ب. شريف نابي، ب رحيمي و م. باهار. كلية الزراعة، جامعة أصفهان للتكنولوجيا، أصفهان، إيران، البريد الإلكتروني: sharifna@cc.iut.ac.ir

تعذ الأفلاتوكسينات المشكلة الرئيسية التي تعترض إنتاج وتصدير الفستق الحلبي في إيران. والفستق قابل للإصابة بأنواع *Aspergillus* المنتجة للتوكسينات وما يرافقها من إنتاج للأفلاتوكسين أثناء عمليات ما قبل الحصاد، التجهيز، النقل والتخزين. تتطلب الطرائق التقليدية للكشف عن الأفلاتوكسينات، بما في ذلك طرائق الكروماتوغرافيا (ذي الطبقة الرقيقة و HPLC) وقتاً وجهداً وتكلفة، في حين أن الكشف بالإعتماد على تفاعل البلمرة المتسلسل PCR أسرع وأكثر موضوعية في كشف الفطور المنتجة للأفلاتوكسينات. تم في هذه الدراسة جمع عينات فستق من بساتين الفستق الحلبي في مقاطعات كرمان، رافسنجان وأصفهان. عزلت أنواع *Aspergillus* على المستنبتين PDA و AFPA وتم الحصول على 250 عزلة، انتمت إلى أنواع *Aspergillus*، *Fusarium*، *Rhizopus*، *Alternaria*، *Cladosporium* استخدمت في دراسات لاحقة. درست مواصفات أنواع *Aspergillus* النامية على مستنبتات MEA، CYA، CY20S والمكبرة وتحت المجهر. وقد تم تعريف 10 أنواع من *Aspergillus* هي *A. parasiticus*، *A. ochraceus*، *A. niveus*، *A. niger*، *A. flavus*، *A. candidus*، *A. alliaceus*

الشاهد مع زيادة الرقم الهيدروجيني وانخفاض الحموضة ونسبة المواد الصلبة الذائبة الكلية بالثمار. وأدت جميع المعاملات باستثناء المعاملة بالماء الساخن عند درجة حرارة 46 °س إلى نقص معنوي في محتوى الثمار من المواد الفينولية وزيادة في السكريات الكلية والسكريات غير المختزلة. وعلى العكس من ذلك لم تتأثر السكريات المختزلة بالمعاملة الساخنة. وبينت النتائج أيضاً حدوث نقص واضح في نشاط العديد من الإنزيمات مثل البكتين ميثيل إستريز والبولي جلاكترونيز والبولي ميثيل جلاكترونيز والسليوليز والبولي فينول أوكسيديز والبيروكسيديز في الثمار المحقونة بأي من الفطرين عند معاملتها بالإيثانول 10% عند درجتي حرارة 46 أو 50 °س وذلك مقارنة بمعاملة الشاهد أو معاملة الثمار بالماء الساخن عند درجتي الحرارة ذاتهما.

F 10

طرائق للوقاية من فطريات التخزين على ثمار التفاح. أمل صيداوي¹، صلاح الشعبي¹ وجودة فضول². (1) الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: ramakot94@maktoob.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة دمشق، دمشق، سورية.

تم في هذا البحث دراسة طرائق للوقاية من الأمراض الفطرية التخزينية على ثمار التفاح. نفذت في مركزي بحوث سرغايا والسويداء خلال الموسمين 1999/1998 و 2000/1999 تجارب رش أشجار التفاح صنف غولدن ديليشس وستاركن ديليشس بالمبيدات أيبورديون، بينوميل، ثيوفانات الميثيل، والماء المتجدد وترك شاهد بدون رش، وذلك قبل القطاف بشهر. كما نفذت تجارب غمس ثمار التفاح من كلا الصنفين قبل التخزين مباشرة باستخدام محاليل من ذات المبيدات، والماء المتجدد وترك شاهد بدون غمس. ودرس أيضاً تأثير غمس عبوات مستعملة (خشبية، بلاستيكية، بوليستير، كرتون) بالفورمالين 1% قبل التخزين مباشرة في خفض إصابة ثمار التفاح من كلا الصنفين بالأعفان التخزينية. كما استخدم بكتيريا *Citrobacter spp.* و *Shewanella putrefaciens* وخميرة، تم استخلاصها جميعاً من ثمار التفاح، إذ غطست ثمار كلا الصنفين في معلقاتها وكذلك بالماء المتجدد وقورنت مع بينوميل وزيت البارافين، وترك شاهد بدون غمس. حفظت الثمار المعاملة في مخازن مبردة ومخازن غيرمبردة. وأظهرت النتائج تفوقاً عند المعاملات التي رشت سواءً بالمبيدات المذكورة، أو بالماء المتجدد مقارنة مع معاملة الشاهد الذي لم ترش أشجاره بالماء وذلك في المخازن المبردة. أما في المخازن غيرالمبردة في السويداء فقد تفوقت معنوياً معاملات الرش بثيوفانات الميثيل على جميع المعاملات الأخرى لدى الصنفين غولدن ديليشس وستاركن ديليشس. وكان أداءه متساوياً مع أيبورديون في سرغايا لدى صنف ستاركن ديليشس، كما تفوقت معنوياً معاملات الرش بأيبورديون على جميع المعاملات في سرغايا لدى صنف غولدن ديليشس. أما في تجارب التغطية فقد تفوقت معنوياً معاملات التغطية بالماء المتجدد والأيبورديون والبينوميل على بقية المعاملات وذلك في المخازن المبردة في كلا الموقعين. وتفوقت معنوياً معاملات التغطية بالماء المتجدد على جميع المعاملات في المخازن غيرالمبردة في سرغايا. كما تفوقت معنوياً معاملات تغطية الصناديق بالفورمالدهيد 1% على جميع الصناديق غير المعاملة بالفورمالدهيد عند تخزينها في المخازن المبردة في كلا الموقعين. وتبين أن أداء معاملة التغطية سواءً بالماء أو بمعلق البكتيريا *Citrobacter spp.* كان جيداً مقارنة مع أداء معلق البكتيريا *S. putrefaciens* والخميرة حيث كان أداءهما متوسطاً.

F 11

سمية وإمراضية الفطر *Hendersonula toruloidea* Natras على أشجار الحمضيات. بسام يحي إبراهيم ونضال يونس المراد، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: nidall234567@yahoo.com

أظهرت نتائج العزل من أشجار البرتقال المصابة بمرض ذبول الأفرع وجود الفطر *Hendersonula toruloidea* Natras. وعند استخدام 7 مبيدات فطرية (بايفيدان، توباز، داكونيل، راکسل، شامبيون، مانكوزيب ويماميل) بثلاثة تراكيز (50، 100 و 150 مغ مادة فعالة/ليتر) لإجراء الإختبار الحيوي، أحدثت جميع المبيدات المستخدمة تثبيطاً لنمو العزل الفطري باستثناء المبيد يمامل. وتماشت نتائج استخدام المبيدات حقلياً مع نتائج الإختبار الحيوي. وعند إجراء إختباري ذبول الأفرع والعجز في مقدار الاستهلاك للأفرع المقطوعة مع رشاحة الفطر، أحدثت الأخيرة ذبولاً للأفرع بعد يوم واحد فقط وسببت جفافها الكامل في غضون ثلاثة أيام. كما أحدثت الرشاحة عجزاً مائياً في عقل البرتقال. أسفرت نتائج المدى العائلي للإصابة عن الفطر يصيب أصناف الليمون الحامض والحو والنانج والماندرين والكريب فروت.

البراعم مما يؤكد بقاء *Mycosphaerella* الفطر كامناً خلال أشهر الشتاء لإحداث الإصابة الأولية في الموسم التالي. كما دلت الدراسة أن الطور الجنسي للفطر الذي يحدثه في نهاية موسم النمو بتكوين الأجسام الثمرية يبدأ مع منتصف شهر أيلول/سبتمبر من الموسم. كما أظهرت نتائج تجربة المكافحة تحت ظروف الحقل في منطقة الياووده فوق المبيدات روبيجان، بايفدان، انفل، اسيزول، سيستان وترفماين المستعملة تفوقاً معنوياً مقارنة بالشاهد غير المرشوش، حيث أظهر المبيدان سيستان وبايفدان فاعلية في تقليل تردد الإصابة (16.1) وشدتها (17.4%).

F 7

المقاومة المستحثة لمرض اللفحة النارية في التفاح المتسبب عن البكتريا *Erwinia amylovora*. محمد عاطف سلام، كمال أحمد أبو اليسر ومحمد حسن عبد الرحيم حسن، كلية الزراعة جامعة أسيوط، أسيوط، مصر، البريد الإلكتروني: amnsallam@yahoo.com

تم دراسة تأثير بعض المواد التي تعمل على تحفيز المقاومة في النباتات بغرض الحصول على طرق لمكافحة مرض اللفحة النارية في التفاح بدلاً من استخدام المضادات الحيوية التي تعتبر في الوقت الحالي من أهم طرق مكافحة المرض. ومن بين هذه المواد المستخدمة في تحفيز المقاومة البيون والبيوزيل 2000 ب وكذلك البكتريا *Rhanelia aquatilis* (Ra39). تم دراسة تأثير هذه المواد في نمو البكتريا الممرضة في الأطباق ووجد أن هذه المواد ليس لها تأثير تثبيطي في النمو. وبدراسة تأثير هذه المواد في المرض في الصوبة وجد أنها تعمل على خفض نسبة الإصابة بالمرض بنسبة 82،69 و 59%، على التوالي. وكذلك وجد أن لهذه المواد تأثير في خفض أعداد البكتريا في النباتات بنسبة تراوحت من 49 إلى 64%. وقد أدى استخدام هذه المواد في الحقل إلى انخفاض الإصابة بنسبة 21، 29 و 55%، على التوالي. وكذلك تم دراسة تأثير هذه المواد في التغيرات البيوكيميائية في النباتات بعد المعاملة حيث وجد أنها تؤدي إلى زيادة في نشاط كل من المحتوى الكلي للفينول وإنزيمات (البوليفينول اوكسيديز والبيتا جليكوسيديز) وكذلك البروتينات المتعلقة بالقدرة المرضية (الكشيتينيز والبيتا 1.3 جلوكينيز) والمعروفة كواسمات بيوكيميائية للمقاومة الجهازية المكتسبة.

F 8

تقصي انتشار مرض ذبول المشمش في غوطة دمشق. محمد نذير موصلي، محمد حسام صافية، أسامة قطيفاني ومحمد عدنان نحلاوي، الهيئة العامة للبحوث العلمية الزراعية، إدارة بحوث وقاية النبات، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: m.mousliuf@swissinfo.org

أجريت الدراسة في منطقة الغوطة الشرقية في محافظة ريف دمشق، خلال الفترة الواقعة بين 15 أيار/مايو و 15 تموز/يوليو في عامي 1997 و 1998. هدفت الدراسة إلى تقصي انتشار مرض الذبول والجفاف في الحقول المزروعة بأشجار المشمش، وتحديد مسبب هذه الظاهرة، وتحديد نسبة الإصابة وشدتها. بلغ عدد القرى التي تم تقصي المرض فيها 16 قرية، تمثل 711 هكتاراً. بلغت نسبة الإصابة بالذبول 6.07% وشدتها 2.2%. أخذت 115 عينة من أفرع الأشجار المصابة، وتم عزل الممرضات مخبرياً على بيئة PDA. بلغت نسبة وجود الفطر *Verticillium dahliae* 60% من نسبة تواجد الفطريات الأخرى والتي تراوح نسب تواجدها بين 2-8%. طبقت نظرية كوخ لتحديد المسبب المرضي للذبول المشمش وذلك بعمل مشتل مرضي تربته معقمة ومعدياً بصطناعياً بمعلق الفطر *V. Dahliae*، وبعد 20 يوماً من إنبات نوى المشمش ظهر على البادرات أعراض ذبول حقيقي، عزلت الممرضات من البادرات المصابة على بيئة PDA، وكان نتيجة العزل نمو فطر *V. dahliae* فقط، ونستنتج من ذلك أن الفطر *V. dahliae* هو المسبب لمرض ذبول المشمش.

F 9

فعالية الغمر بالماء الساخن أو الإيثانول في تقليل العفن الطري لثمار الخوخ بعد الحصاد. عز الدين محمد يونس العوامي، قسم وقاية النبات، كلية الزراعة، جامعة عمر المختار، البيضاء، ليبيا، البريد الإلكتروني: Azzawami2002@yahoo.com

أدى غمر ثمار الخوخ المحقونة بأبواغ الفطر *Botrytis cinerea* أو *Rhizopus stolonifer* في الماء الساخن أو الإيثانول 10% عند درجة حرارة 46 أو 50 °س إلى تقليل تطور عفن الثمار معنوياً مقارنة بمعاملة الشاهد (الغمر بالماء عند درجة حرارة الغرفة)، وسجلت أقل نسبة إصابة عند غمر ثمار الخوخ في الإيثانول 10% عند درجة حرارة 50 °س لمدة 2.5 دقيقة. وأوضح الفحص بالمجهر الإلكتروني الماسح ظهور نموات غير طبيعية للفطرين عند معاملة الثمار المحقونة بالماء الساخن عند درجة حرارة 50 °س أو الإيثانول 10% عند درجة حرارة 46 °س حيث حدث تشوه لهيئات الفطر *R. stolonifer* نتيجة لتجعدها وفقدانها انتفاخها، بينما قل النمو الميسليومي للفطر *B. cinerea* مع تفرع هيفات هذا الفطر بدرجة أقل. من ناحية أخرى، لوحظ انخفاض كبير في إنبات أبواغ الفطرين عند معاملة الثمار المحقونة بها بالإيثانول 10% عند درجة حرارة 50 °س. وأظهرت النتائج كذلك انخفاض الفاقد في وزن الثمار المحقونة عند المعاملة الساخنة مقارنة بمعاملة

على مصدر الكربون والنيتروجين ودرجات الحرارة. وإزداد تركيز هذه المادة في الأوراق مع تطور المرض، وبلغ حده الأعظم عند النقطة الحرجة عندما تغير لون الأوراق الملوثة إلى الأصفر وسقوطها.

F 4

مرض ذبول شجرة الزيتون في المغرب: انتشاره، التغيرات الوراثية لدى الفطر الطفيلي وتقييم مقاومة بعض الأصناف الجيدة. مولاي الحسن سدره¹، خديجة لشكر² وسعاد نور³. (1) مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، ص.ب. 533، مراكش، المغرب؛ (2) كلية العلوم، جامعة القاضي عياض، مراكش، المغرب؛ (3) مختبر وقاية النباتات والدراسات الجينية والمكافحة المتكاملة، المعهد الوطني للبحث الزراعي، مراكش، المغرب، البريد الإلكتروني: sedramh@hotmail.com، sedramh@menara.ma، mhsehra@yahoo.fr

ينتشر مرض ذبول شجرة الزيتون الفريستليومي المتسبب عن الفطر *Verticillium dahliae* في مناطق عديدة في المغرب بمستويات إصابة مختلفة. أظهرت دراسة وبائية المرض المتعلقة بمنطقة الحوز الانتشار الجغرافي المهم للمرض، مع اختلاف كبير في درجة حدوثه (0-100%). وكانت 10 جماعات قرؤية من أصل 15 جماعة شملت الدراسة موبوءة بالمرض، وكانت تاملت الأكثر تضرراً. أشارت الدراسة أيضاً إلى العوامل المهمة التي تساعد على تفاقم وانتشار المرض بالمنطقة، فقد تفسى المرض في البساتين غير المعمرة ذات الكثافة المرتفعة والمروية والتي توجد معها مزروعات تحثية ولا تستفيد من التسميد النيتروجيني الكافي. أسفرت نتائج تقييم القدرات الإعدائية لسلاسل عديدة من الفطر المسبب للمرض من خلال الدراسة المخبرية وجود تباين جوهري في مستوى هذه القدرات وتغير مستمر للقدرة الإعدائية. كما بينت الدراسات المخبرية الأخرى باستخدام تقانات التطابق الخضري والتقانات الجزيئية وجود تغيرات وراثية محدودة، تتوزع في ثلاث مجموعات اعتماداً على تقانة التطابق الخضري وفي أربع مجموعات اعتماداً على تقانة RAPD. وتبين أن معظم سلاسل الفطر تنتمي إلى مجموعة واحدة وأن المجموعات تربط بينها علاقات وراثية مهما كانت التقانة المستخدمة لتكوين هذه المجموعات. ولم يسجل وجود أي علاقة بين المجموعات المتحصل عليها بكلا التقانتين ومصدر ومكان عزل سلاسل الفطر ومستوى قدرته الإعدائية. وأظهرت نتائج تقييم مقاومة بعض الأصناف وجود تباينات معنوية في سلوكها إزاء المرض تحت الظروف المخبرية. يبدو أن معظم الأصناف المختبرة حساسة للمرض، وكان الصنف لانكدوك أكثرها مقاومة. وقد تم إنتقاء بعض النباتات البذرية الأصل من الأشجار الغابوية أظهرت مقاومة للمرض.

F 5

تشخيص الفطر *Verticillium dahliae* kleb. المسبب لذبول الزيتون باستخدام تفاعل البلمرة المتسلسل PCR. هدى حازم الطائي وعلي كريم الطائي، كلية الزراعة والغابات، جامعة الموصل، العراق، البريد الإلكتروني: htaae@yahoo.com، aaltaae@yahoo.co.uk

تم الحصول على 31 عزلة من الفطر *Verticillium dahliae* kleb. من أشجار الزيتون من مواقع مختلفة في محافظة نينوى بالعراق. وتم تدعيم التشخيص باستخدام تقنية تفاعل البلمرة المتسلسل PCR باستخدام زوج من البادئات RVD و FVD المتخصصة بالفطر *V. dahliae*، وزوج آخر FVA و RVU متخصصة بالفطر *V. albo-atrum*. أظهرت النتائج أن جميع العزلات تابعة للنوع *V. dahliae*، كون الحزم الناتجة كانت بحجم 330 زوج قاعدي، وهو الحجم المتوقع الذي ينتجه زوج البادئات RVD و FVD. والملاحظ أن العزلات من الأشجار السليمة التي لم تظهر عليها أية أعراض إصابة بالذبول أعطت حزماً مماثلة، الأمر الذي يشير إلى أنها مصابة بالفطر *V. dahliae*، وهذا يدل على كفاءة تقنية تفاعل البلمرة المتسلسل في تشخيص الإصابة حتى لو كانت كامنة في أشجار الزيتون المزروعة في الحقول. ولم يلاحظ حدوث تفاعل مع زوج بادئات FVA و RVU، الأمر الذي يشير إلى عدم وجود النوع *V. alb-atrum*.

F 6

وبائية ومكافحة مرض البياض الدقيقي *Podosphaera leucotricha* على التفاح في الأردن. حفزي أبو بلان وأسعد عبد الرحمن. قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان، الأردن، البريد الإلكتروني: hifzi@ju.edu.jo

أجري عدد من التجارب لدراسة وبائية ومكافحة مرض البياض الدقيقي على التفاح تحت ظروف الإنتاج الرئيسية في ستة مواقع في الأردن على أصناف غولدن ديليشس وستاركن، خلال الفترة ما بين نيسان/أبريل 2000 وأيار/مايو 2003. سجلت خلال الدراسة مواعيد مراحل نمو وتطور براعم التفاح، مواعيد الإصابة الأولية، نسبة وشدة المرض على الأوراق وتطور المرض خلال الموسم وعلاقة ذلك بدرجات الحرارة والرطوبة النسبية التي سادت في كل موقع. كما حددت مصادر الإصابة الأولية وأطوار تشيية الفطر وحيويتها. أظهرت الدراسة الأثر الواضح لإختلاف درجات الحرارة في تباين كل من نسبة المرض وشدته من موقع لآخر، وكذلك في مواعيد الإصابة الأولية للمرض. أظهر فحص البراعم تحت ظروف المختبر وكذلك نتائج عمل القطاعات العرضية في البراعم الساكنة وجود أجزاء من الفطر *Podosphaera leucotricha* بين حراشف

F 1

التسجيل الأول لفطر *Coniothyrium olivaceum* الذي يصيب غراس وأشجار الزيتون في سورية. مصطفى بلالر وموازن بلالر، مختبر مركز بلالر التخصصي لوقاية المزروعات، الحميدية، سيد علي، شارع قاسيون، ص.ب. 10444، حلب، سورية.

ظهرت في أعوام 1998، 1999، 2000 و 2001 أعراض مرضية محدودة على غراس وأشجار الزيتون والمزروعة في مشاتل وبساتين الزيتون في محافظات ادلب وحلب، وحماه من سورية. وقد تمثلت هذه الأعراض بشحوب وإصفرار الأوراق والأفرع، تحولت إلى تقرحات ولفحة وموت تراجمي للأفرع والفريعات، تميزت بوجود تقرحات سطحية أو عميقة ومتشققة طولياً تظهر منها أنسجة الخشب الداخلية، ويأخذ القلف فوقها لونا أصفر باهتا أو أسود. ويشاهد تشققات طولية وعديدة تؤدي إلى تقشير الفروع وتعرية خشبها، وقد تتحد هذه التقرحات والتشققات طولياً وعلى محيط ساق الأفرع وفريعات غرسة أو شجرة الزيتون. والأفرع التي تلي موضع التقرحات والتشققات يعترتها الإصفرار الباهت والذبول، الأمر الذي يعقبه موت تراجمي للفروع الطرفية. وبلغت شدة الإصابة ذروتها على 1-10% من الغراس، إذ كانت خفيفة على أكثر من 48% من الغراس. وكانت نسبة الإصابة في حماه وادلب وحلب 5.75، 4.47 و 3.87%، على التوالي. وقد أظهرت نتائج العزل المخبري، ودراسة الخصائص المظهرية للمستعمرات، والفترة الإمراضية لبعض الكائنات المعزولة، إضافة إلى دراسة الأبعاد البيومترية للوحدات التكاثرية إلى اشتراك تسعة فطور من إحداهن هذه المظاهر المرضية المختلفة. بنيت دراسة القدرة الإمراضية للفطور الرئيسية المعزولة أن *Coniothyrium sp.* له مقدرة كبيرة على إظهار علامات التقرح واليباس التراجعي النموذجي بشكل يفوق تأثير جميع الفطور الأخرى المختبرة، كما يشاركه فطر *Hendersonia sp.* في إحداث ذات العلامات السابقة. إن سبب ظاهرة تقرح ويباس فروع غراس وأشجار الزيتون في سورية هو فطر *Coniothyrium olivaceum* ويشاركه أحيانا فطر *Henderonia sp.* وهو تسجيل جديد لوجوده في سورية.

F 2

مرض الذبول الفرتسليومي على أشجار الزيتون بالجزائر: دراسة حدوثه وتحديد سلالات جزائرية من فطر *Verticillium dahliae* باستخدام تقنية PCR وRAPD. م. بلحسن¹، ز. فرطاس²، ل. بلعيد³ وم. نيكول⁴. (1) كلية العلوم، جامعة مستغانم، الجزائر، البريد الإلكتروني: belahcene_miloud@yahoo.fr؛ (2) كلية العلوم، جامعة وهران، الجزائر؛ (3) المركز الجامعي معسكر، معسكر، الجزائر؛ (4) IRD، مونبلييه، فرنسا.

يعتبر مرض الذبول الوعائي على الزيتون المتسبب عن الفطر (*Verticillium dahliae* (Kleb) هو المسؤول الرئيس عن موت مئات أشجار الزيتون بالجزائر. ولدراسة البنية وتقدير التنوع الوراثيين لهذا الفطر استعملت تقنيات متعددة واستخدمت 32 عزلة محلية بالإضافة إلى 12 عزلة من فرنسا و 4 عزلات من سورية للمقارنة. ومن خلال تقنية PCR أمكن استنكار/تضخيم قطع ITS، ITS-1 و ITS-2 من DNA باستخدام بادنين إثنين (ITS4-ITS). أظهرت النتائج أن كل السلالات لها ذات القطعة بطول 550 زوج قاعدي. ومن خلال تقنية التطابق الخضري واستنادا إلى التسمية العالمية تبين أن كل العزلات تنتمي إلى ذات المجموعة التي قد تكون إما GCV-2 أو GCV-4. وباستخدام إثنين من أنزيمات القطع للجزء ITS اتضح تطابق عزلات *V. dahliae* فيما بينها وتؤكد انتمائها إلى ذات المجموعة تبعا لتقنية PCR-RFLP، ووجود تباين ضعيف بينها تبعا لتقنية RAPD. وإضافة لذلك فإن استخدام اثنين من الأوليغونكليوتيد النوعي في استنكار/تضخيم الـ DNA باستعمال الـ PCR أظهر أن كل العزلات كانت من النمط المبقي للأوراق (none defoliating). وتم تقدير متوسط التباين الوراثي بحوالي 7.05% مع تجانس العشيرة الفطرية إلى حد بعيد. وقد بلغت نسبة التشابه 100% في تتابع القواعد الأزوتية لقطعة ITS في السلالة المختارة عشوائيا (V6) والسلالة المرجعية. أعطت نتائج حقن 8 سلالات ممثلة لأربع مجموعات RAPD في نبات الطماطم/البندورة فأظهرت أعراضا مرضية متشابهة، ولا يمكن معها ملاحظة تأثير المصدر الجغرافي للسلالات. كما أن الدراسة الإحصائية لم تبين الفروق الملموسة في نتائج عملية العدوى الإصطناعية.

F 3

تواجد مادة استقلابية سامة للنبات في أوراق الزيتون *Olea europaea* L. المصابة بـ *Spilocaea oleaginea*. عبد الهادي قشي وسامية مزعاش، مخبر الاحياء الدقيقة وأمراض النبات كلية العلوم، جامعة فرحات عباس، سطيف 19000، الجزائر، البريد الإلكتروني: guechi.abdelhadi@caramail.com

يعد الزيتون أحد المحاصيل المهمة في الجزائر والتي تصاب بأنواع عديدة من الفطريات الممرضة، من أهمها مرض عين الطاووس الذي يسببه الفطر *Spilocaea oleaginea*. تم استخلاص مادة استقلابية سامة للنبات في هذه الدراسة من الأوراق المصابة والميسليوم وكذلك من السوائل المختلفة بعد استنبات الفطر لمدة ستة أشهر. توقف إنتاج هذه المادة الفطرية

أمراض فطرية

M 9

قراءة أولية في الأعراض الظاهرية للدلالة على إصابة المزروعات بالأكاروسات/العناكب. ردينة صالح جبور¹ وإبراهيم عزيز صقر². (1) مديرية زراعة اللاذقية، مصلحة زراعة جبلة، البريد الإلكتروني: a-raheb@scs-net.org؛ (2) قسم وقاية النباتات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية، البريد الإلكتروني: ibra4591@maktoob.com

تصيب المزروعات آفات متنوعة تتفاوت في أضرارها وخطورتها، وبالتالي في الحاجة للتدخل بهدف السيطرة عليها والحد من انتشارها. ويتوقف نجاح الإجراءات المتخذة على التشخيص الذي تمثل صحته نصف العلاج. ونظراً إلى اعتماد المراحل الأولى لتشخيص الإصابة بالأكاروسات/العناكب وفي الجانب الحقلية منه تحديداً على أعراض الإصابة الظاهرية التي كثيراً ما تتشابه مع أعراض تحدثها آفات أخرى أو تنشأ بفعل عوامل بيئية وفيزيولوجية، فقد استند البحث في قراءته للأعراض على معايير محددة لظواهر مرافقة للإصابة بالأكاروسات/العناكب تميزها عن غيرها وتتضمن سلامة التشخيص ونجاح إجراءات المكافحة.

M 10

المكافحة الحيوية لأكاروس الموالح البني باستخدام المفترس الأكاروسي *Neoseiulus californicus* على أشجار الحمضيات/الموالح. جمال الدين عبد المجيد إبراهيم، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، وزارة الزراعة، الدقي، جيزة، مصر، البريد الإلكتروني: shaaban59@yahoo.com

يعتبر أكاروس الحمضيات/الموالح البني أحد الآفات الأكاروسية الهامة التي تصيب أشجار الموالح مسبباً لها أضرار بالغة للأوراق والثمار، والأكثر من ذلك يسبب تشوهات للثمار مما يعيق عملية التصدير. وقد لوحظ في الأعوام الثلاثة الأخيرة انتشار هذه الآفة على أشجار الحمضيات/الموالح مما يضطر المزارعين إلى الاستخدام المكثف للمبيدات المتخصصة فيزيد من التكاليف وتلوث الثمار. لذا اتجهنا في هذا البحث إلى استخدام أحد العناصر الحيوية في مكافحة هذه الآفة بالأكاروس المفترس *Neoseiulus californicus*. حيث تم إطلاق هذا المفترس على أشجار الحمضيات/الموالح بمعدل 40، 50 و 70 فرد للشجرة عند متوسط مستويات إصابة 4.64، 5.066 و 4.7 على الورقة، على التوالي. وبعد أربعة أشهر من إطلاق المفترس انخفضت متوسط مستويات الإصابة إلى 3.6، 2.4 و 1.02 فرد على الورقة، على التوالي، وأدى المفترس إلى نسبة مئوية للخفض في الإصابة بلغت 57.84، 73.76 و 88.25%، على التوالي. ومما سبق يتضح أن أنسب مستوى إطلاق لمكافحة هذه الآفة هو 70 فرد مفترس للشجرة، وفي نفس الوقت توضح النتائج أن هذا المفترس له قدرة فائقة في مكافحة هذه الآفة، لذا يمكن استخدام هذا المفترس خلال برامج المكافحة المتكاملة للآفات على أشجار الحمضيات/الموالح التي تهدف إلى ترشيد استخدام المبيدات وتشجيع المكافحة الحيوية والحفاظ على التوازن البيئي وخفض نسبة التلوث بالمبيدات.

M 7

إطلاق المفترس الأكاروسي *Phytoseiulus macropilis* (Banks) على نباتات الفاصولياء لمكافحة الأكاروس العنكبوتي ذو البقعتين *Tetranychus urticae* Koch خلال فصول السنة في مصر. ابراهيم حسن هيكل، المختبر المركزي للزراعة العضوية، مركز البحوث الزراعية، 9 شارع الجامعة، الجيزة، مصر، البريد الإلكتروني: Organic_agr@yahoo.com
تم إطلاق المفترس الأكاروسي *Phytoseiulus macropilis* (Acari: Phytoseiidae) على نباتات الفاصولياء لمكافحة الأكاروس العنكبوتي ذو البقعتين *Tetranychus urticae* (Acari: Tetranychidae) تحت ظروف دقيقة شبكية بمنطقة الدقي (محافظة الجيزة) في فصول السنة المختلفة. أظهرت نتائج الدراسة أن فصل الشتاء كان الأفضل من بين الفصول الأخرى لإطلاق المفترس بمعدلات 9، 6 و 3 أفراد/نباتين. وقد انخفضت الكثافة العددية للأكاروس العنكبوتي شتاءً بدرجة ملحوظة، حيث وصلت النسبة المئوية للانخفاض في المراقبة الأولى بعد الإطلاق (بعد أسبوعين) 100، 81 و 78% عند مستويات الإطلاق 9، 6 و 3 أفراد/نباتين، على التوالي. وقد يعود ذلك لانخفاض الكثافة العددية للأكاروس العنكبوتي حين إطلاق المفترس الأكاروسي، نظراً لضعف تكاثره في ظروف الشتاء البارد نسبياً مقارنة مع ظروف الفصول الأخرى، التي سمحت للمفترس بالسيطرة على تعداد مجاميع الآفة. وقد بينت نتائج الدراسة أيضاً أن الكثافة العددية للأكاروس العنكبوتي ذو البقعتين كانت منخفضة نسبياً في فصل الربيع عند إطلاق المفترس، الأمر الذي شجع أفراد المفترس على الإستجابة الوظيفية والعددية لزيادة نمو وتكاثر وازدياد الآفة الأكاروسية والسيطرة عليها. وعموماً فإن فصلي الربيع والخريف يعتبران مناسبان لنمو وتكاثر المفترس الأكاروسي وتطوره فتنتج عنه السيطرة على الأكاروس العنكبوتي ذو البقعتين ومكافحته، لاسيما في مستوى الإطلاق الأعلى (9 و 6 أفراد/نباتين). وعلى العكس من ذلك، فإن درجات الحرارة المرتفعة ودرجات الرطوبة النسبية المنخفضة السائدة في أشهر الصيف كانت مناسبة لآفة أكثر من المفترس وحفزت على الزيادة السريعة في مجاميع الأكاروس العنكبوتي ذو البقعتين، بحيث أدى ذلك إلى تدهور نباتات الفاصولياء قبل إتاحة الفرصة لأفراد المفترس من السيطرة على الآفة الأكاروسية ومكافحتها.

M 8

تأثير درجات الحرارة المختلفة في حياتية الحلم/الأكاروس ذي الرسغ الشعري (Banks) *Polyphagotarsonemus latus* على البطاطا/البطاطس تحت الظروف المختبرية. لؤي قحطان العاني و ابراهيم جدوع الجبور، قسم وقاية النبات، كلية الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: luaay_kalani@yahoo.com

يعد الحلم/الأكاروس ذي الرسغ الشعري (Banks) *Polyphagotarsonemus latus* (Acari: Tarsonomidae) واحداً من الآفات المهمة على محصول البطاطا/البطاطس في العراق، حيث انتشر بشكل واسع في السنوات الأخيرة ليصيب محاصيل أخرى من نباتات الفاكهة والخضار. شملت الدراسة تربية الحلم/الأكاروس في المختبر عند خمس درجات حرارة مختلفة 15، 20، 25، 30 و 35 ± 1 °س لكل من الإناث الملقحة والإناث البكرية. أوضحت الدراسة أن لدرجة الحرارة تأثيراً كبيراً في حياتية هذا النوع من الحلم، فقد سجلت درجة الحرارة 15°س أطول فترة لكل من فترات حضانة البيض، الطور اليرقي، الطور الساكن، ما قبل وضع البيض، وضع البيض، حياة الأنثى، دورة الحياة بالكامل وطول الجيل، حيث بلغت معدلاً وسطياً قدره 6.25، 3.50، 2.38، 3.13، 4.69، 9.06، 12.13 و 14.00 يوماً، على التوالي للإناث الملقحة، في حين بلغت 6.44، 3.13، 2.13، 2.25، 4.88، 9.19 و 11.69 يوماً، على التوالي، للإناث البكرية. وقد سجلت درجة الحرارة 35°س أننى مدة إذ بلغت 1.29، 0.57، 0.57، 0.14، 0.14، 1.86، 3.36، 2.43 و 2.57 يوماً، على التوالي، للإناث الملقحة، وبلغت 1.13، 1.00، 0.19، 0.38، 1.25، 3.06 و 2.19 يوماً، على التوالي، للإناث البكرية. أما بالنسبة لعدد البيض الموضوع باليوم فقد سجلت درجة الحرارة 35°س أعلى معدل له إذ بلغ 5.00 و 2.25 بيضة للإناث الملقحة والبكرية، على التوالي، في حين سجلت درجة الحرارة 15°س أدنى معدل له إذ بلغ 1.63 بيضة لكل من الإناث الملقحة والبكرية. وقد بلغ عدد البيض الكلي للأنثى الواحدة عند درجة حرارة 25°س أعلى معدل 11.57 بيضة له في الإناث الملقحة وأقل معدل عند درجة حرارة 30°س 8.86 بيضة في الإناث البكرية، بينما سجلت درجة الحرارة 15°س أدنى معدل له 7.75 (بيضة في الإناث الملقحة) وعند درجة 35°س في الإناث البكرية الذي بلغ 5.13 بيضة. أما النسبة المئوية للفقس فقد سجلت درجة الحرارة 35°س أعلى نسبة 93.06، 86.67% للإناث الملقحة والبكرية، على التوالي، في حين سجلت درجة الحرارة 15°س أدنى نسبة فقس 72.04، 66.36% للإناث الملقحة والبكرية، على التوالي. أما النسبة الجنسية (إناث : ذكور) فسجلت درجة الحرارة 30°س أعلى نسبة لها 1:6.50 وسجلت درجة الحرارة 20°س أدنى نسبة لها 1:2.10.

M 4

تقويم قابلية بعض أصناف القطن للإصابة بالأكاروس العنكبوتي ذو البقعتين (*Tetranychus urticae* Koch) في مصر. حسن علي أحمد طه¹، محمد رجائي عباس²، مصطفى حلمي² وحسين عبد الحميد عزوز¹. (1) معهد بحوث وقاية النبات، 7 شارع نادي الصيد، الدقي، جيزة، مصر؛ (2) كلية الزراعة، جامعة الأزهر، القاهرة، مصر، البريد الإلكتروني: marim_elsanady@yahoo.com

أجريت دراسات حقلية ومخبرية لتقييم أربعة أصناف من القطن المصري المزروع (جيزة 80، جيزة 81.83، جيزة 83 وجيزة 90) لمدى مقاومتها أو حساسيتها أو تحملها للإصابة بالأكاروس العنكبوتي ذو البقعتين (*Tetranychus urticae* Koch) (Acari: Tetranychidae)، وذلك خلال عامي 2002 و2003 بمحطة بحوث سدس-محافظة بني سويف في مصر. تم تربية الأكاروس العنكبوتي ذو البقعتين على أصناف القطن الأربعة مختبرياً للبدء بالدراسة الحقلية، بالإضافة إلى بعض الدراسات المخبرية الكيميائية والتشريحية لأوراق النباتات. أوضحت الدراسة الحقلية والبيولوجية والكيميائية والتشريحية المختبرية لأصناف القطن المدروسة أن الصنف "جيزة 80" كان أكثرها قابلية للإصابة بالأكاروس العنكبوتي ذو البقعتين، بينما كان الصنف "جيزة 83" أقلها قابلية للإصابة بالأفة، في حين كانت قابلية الصنفين "جيزة 81.83" و"جيزة 90" ذات درجة متوسطة للإصابة.

M 5

دراسة حياتية نوعين من المفترسات الأكاروسية عند التغذية على حلم الحبوب (*Tyrophagus putrescentiae* (Schrank) تحت الظروف المختبرية. مريم عبد الرحمن السندي، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: marim_elsanady@yahoo.com

أجريت دراسات حياتية مختبرية لنوعين من الحلم المفترس *Lasioseius sewai* Nasr & AbouAwad و *Blattisocius keegni* Fox (Acari: Ascidae) عند تغذيتها على يرقات حلم الحبوب (*Tyrophagus putrescentiae* (Schrank)) لدراسة مراحل الحياة والخصوبة وجداول الحياة، وذلك عند درجة حرارة 25°س ورطوبة نسبية 60-65%. أوضحت جداول الحياة أن كلا النوعين يمر بالأطوار التالية: بيضة، يرقة، حورية ثم حيوان بالغ (ذكر وأنثى). كما بينت الدراسة أن دورة الحياة استغرقت 9.4 و 10.8 يوماً لكلا النوعين، على التوالي. في حين استغرقت الإناث 2.6 و 2.1 يوماً خلال مرحلة ما قبل وضع البيض، 35 و 20 يوماً خلال مرحلة وضع البيض، 6.1 و 2 يوماً خلال مرحلة ما بعد وضع البيض، للنوعين، على التوالي. كما أن معدل وضع البيض لكليهما كان 33.2 و 25 بيضة بمتوسط يومي 0.9 و 1.3 بيضة للنوعين *L. sewai* و *B. keegni*، على التوالي. كما وجد أيضاً أن النوع *L. sewai* يفترس حوالي ثلاثة أضعاف النوع *B. keegni* من يرقات حلم الحبوب خلال فترة الأنثى البالغة، حيث استهلكت أنثى النوع الأول 104.4 والنوع الثاني 31.8 فرداً خلال نفس الفترة وذلك بمتوسط يومي 1.9 و 0.9 فرداً، على التوالي.

M 6

دراسة حياتية لعنكبوت الكروي (*Steatoda triangulosa* (Walckenaer) عند تغذيته على حشرة دودة اللوز القرنفلية (*Pectinophora gossypiella* (Saund) تحت الظروف المختبرية. محمد حسن العرقسوسي ورضا عبد الجليل محمد، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: marim_elsanady@yahoo.com

تم دراسة حياتية العنكبوت الكروي (*Steatoda triangulosa* (Walckenaer) (Araneida: Theridiidae) عند تغذيته على يرقات حشرة دودة اللوز القرنفلية (*Pectinophora gossypiella* (Saund) (Lepidoptera: Gelechiidae)، وذلك عند درجة حرارة 22±2°س ورطوبة نسبية 50-60%، وجد أنه يمر بخمسة أطوار (الفقس الحديث وأربعة أعمار يرقية). بينت الدراسة أن دورة حياة العنكبوت (البيضة + 5 أعمار يرقية) بلغت معدلاً قدره 130.8 و 126.4 يوماً، والفترة من البيضة حتى الوصول إلى الحيوان الكامل 179.1 و 167 يوماً، وفترة الجيل 307.4 و 299.4 يوماً للإناث والذكور، على التوالي. وقد افترست بالغات العناكب عدداً من يرقات دودة اللوز القرنفلية بمعدل وسطي قدره 326.6 و 202.8 فرداً، وبقيت الأفراد على قيد الحياة لمدة 23.6 و 11.6 يوماً بدون تغذية، وذلك للإناث والذكور، على التوالي.

M 1

مسح للعناكب الحقيقية (Araneae) في شمال سيناء (مصر). جيهان محمد السيد سلام، معهد بحوث وقاية النباتات، 7 شارع نادى الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: Gihansallam2006@hotmail.com؛ Gihansallam2005@yahoo.com
إجري هذا المسح لإلقاء الضوء على بيئة العناكب الحقيقية في ثلاث مناطق (الزرانيق، منطقة المطار، الشيخ زايد) في محافظة شمال سيناء بمصر، خلال الفترة الواقعة ما بين شهر آب/أغسطس، 2003 وحتى آب/أغسطس، 2005. جمعت العينات بطريقتين (طريقة هز النباتات واستقبالها على منخل، وطريقة التجميع اليدوي للأفراد المتحركة على سطح الأرض). تم تعريف العينات بواسطة مفتاح تقسيمي متخصص بأهم الأنواع والمقارنة بعينات أخرى معرفة ومحافظة بالمعهد، مع الاستعانة بخبير في هذا المجال. أظهرت النتائج وجود 23 عائلة (فصيلة) عنكبوتية ممثلة في 24 جنسا و18 نوعا. وكانت أكثر العائلات (الفصائل) انتشارا هي: Oxyopidae، Mituregidae، Gnaphosidae، Agelenidae، Araneidae، Salticidae، Philodromidae، Theridiidae، Tetragnathidae، Scytotidae، Thomisidae، و أقل العائلات (الفصائل) إنتشارا هي: Dictynidae، Eresidae، Filistatidae، Hersillidae، Linyphiidae، Lycosidae، Liocranidae، و كانت أهم الأنواع انتشارا على الإطلاق النوعين *Zodariidae* و *Sparassidae*، *Pholcidae*، *Oceobiidae*، *Mimetidae* و *Argyropelobata* (Araneidae) و *Thomisus spinifer* (Thomisidae).

M 2

تأثير الزيوت المعدنية في الأكاروس العنكبوتي ذو البقعتين (*Tetranychus urticae* Koch) تحت الظروف المخبرية. نهلة علي إبراهيم، معهد بحوث وقاية النباتات، 7 شارع نادى الصيد، الدقي، جيزة، مصر، البريد الإلكتروني: mamin2001@yahoo.com

تم دراسة تأثير الزيوت المعدنية (Antistress) في الأفراد غير الكاملة والكاملة للأكاروس العنكبوتي ذو البقعتين (*Tetranychus urticae* Koch) تحت الظروف المخبرية، إذ جمعت الأفراد من أوراق نبات قطن عليها إصابة شديدة. رشت الزيوت بخمسة تركيزات (350، 750، 1500، 3000 و5000 جزء في المليون) على مكررات مختلفة من أفراد الأكاروس العنكبوتي ذو البقعتين وحفظت عند درجة حرارة 26 °س و90% رطوبة نسبية. أظهرت النتائج أن تأثير الزيوت المعدنية كان عالي في كل الأفراد الكاملة وغير الكاملة للأكاروس. وكانت الأفراد غير الكاملة أكثر حساسية بعد ستة أيام، حيث بلغت نسبة الموت 98.05% عند تركيز 5000 جزء في المليون، بينما بلغت نسبة الموت 91.81% للأفراد الكاملة بعد ستة أيام عند التركيز ذاته.

M 3

إطلاق المفترس الأكاروسي (*Phytoseiulus macropilis* Banks) على نباتات الفراولة/الفريز لمكافحة الأكاروس العنكبوتي ذي البقعتين (*Tetranychus urticae* Koch). مصطفى حلمي موافي¹ وأحمد عبد الحميد إبراهيم². (1) قسم الحيوان الزراعي والنباتات، كلية الزراعة، جامعة الأزهر، مصر؛ (2) معهد بحوث وقاية النبات، مركز البحوث الزراعية، القاهرة، مصر، البريد الإلكتروني: mowafimostafa_6@hotmail.com

تم إطلاق وتحرير المفترس الأكاروسي (*Phytoseiulus macropilis* Banks) (Acari: Phytoseiidae) في حقل فراولة/فريز مفتوح بمحافظة الإسماعيلية لمكافحة الأكاروس العنكبوتي ذي البقعتين (*Tetranychus urticae* Koch) (Acari: Tetranychidae). استخدمت لمرة واحدة إطلاق ميكرومتر متأخر للمفترس الأكاروسي وبمعدل 5 أفراد للمفترس للجورة الواحدة من 14 تشرين الثاني/نوفمبر حتى 14 نيسان/أبريل، لعام 2000. أظهرت نتائج الدراسة انخفاضا في الكثافة العددية للأكاروس العنكبوتي ذي البقعتين في الإطلاق المبكر وبنسبة حوالي 60% بعد 4 أسابيع و90% بعد 7 أسابيع من إطلاق المفترس، في حين وصل هذا الانخفاض إلى حوالي 100% في نهاية المراقبة. وكان تأثير المفترس الأكاروسي في خفض تعداد الآفة في الإطلاق المتأخر أقل من 60% في أحواض الإطلاق في الأسبوع الخامس، ثم إزداد ليصل إلى حوالي 84% في المراقبة الأخيرة 14 نيسان/أبريل. وقد أشارت الدراسة إلى إمكانية مكافحة الأكاروس العنكبوتي ذي البقعتين في حقول الفراولة/الفريز المفتوحة بإطلاق واحدة مبكرة للمفترس الأكاروسي في موسم الفراولة/الفريز وعندما يكون تعداد الآفة منخفضا لإعطاء المفترس الفرصة كي يلعب دوره بنجاح.

حلم / أكاروسات

كبيرة، و لكن استعمالها بكثرة يتضمن عدة سلبيات، لأجل هذا المجتمع العلمي، بحث عن حلول بديلة للمكافحة الكيميائية ومن بين الوسائل المقترحة، توجد المكافحة الأحيائية باستعمال الفطريات، ووحدات الخلية، والفيروسات والبكتيريا. وفي هذا الإطار قمنا بدراسة تأثير 4 أنواع من البكتيريا، وهي: *Bacillus thuringiensis*، *Bacillus subtilis*، *Pseudomonas aeruginosa*، و *Bacillus larvae* في يرقات *Schistocerca gregaria* في الأطوار L1، L2، L3 و L4. تم تمديد المحاليل البكتيرية انطلاقاً من المحلول الأم 10^0 ، وفقاً للتراكيز التالية: 10^{-1} ، 10^{-3} و 10^{-6} . بعد تحضير المحاليل البكتيرية وخلطها جيداً مع الغذاء (أوراق الخس) تم توزيع يرقات الجراد الصحراوي في أقفاص صغيرة وقدم لها الغذاء الممزوج بمحلول البكتيريا، وتم إجراء عدّ يومي لنسبة الوفيات في معاملة الشاهد والمعالج وتحديد TL 50 ومدى تأثير الجنس في نسبة الوفيات عند L4 المعالين بالبكتيريا.

DL 9

كفاءة الديفلوبنزورون تجاه يرقات الطور الرابع والخامس للجراد الصحراوي في المختبر. طایل غنية¹، باتريك بورشورون² وبهية دومانجي متيش³. (1) قسم البيولوجيا، كلية العلوم الفلاحية البيطرية والبيولوجية، جامعة سعد دحلب، البلدة، الجزائر، البريد الإلكتروني: g-tail@caramail.com؛ (2) جامعة بيار وماري كوري، باريس 6، فرنسا؛ (3) قسم علم الحيوان، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر.

تم تقييم أثر الديفلوبنزورون (مشتق من البنزويل فينيل يوريا) على الجراد الصحراوي، تم العلاج مدة يوم واحد عن طريق الأكل على يرقات الطور الرابع والخامس للجراد الصحراوي. أدى العلاج إلى موت اليرقات ومنع ظهور يرقات بالغة، كما أدى إلى إخلال النمو والتطور. منع الديفلوبنزورون عملية الانسلاخ عند الجراد الصحراوي الأمر الذي أكد على وسيلة العمل الابتدائية لهذا المبيد للحشرات. كما بينت النتائج أن أقصر مدة زمنية متحصل عليها لموت 50% من الجراد المعالج هي عند يرقات الطور الرابع.

DL 10

دراسة مخبرية للفاعلية الحيوية لمثبط النمو "Teflubenzuron" على القشرة والأنبوب الهضمي ليرقات الطور الخامس للجراد الصحراوي. فاطمة عاشق¹ وبهية دومانجي متيش². (1) قسم البيولوجيا، كلية العلوم، جامعة بومرداس، الجزائر؛ (2) قسم علم الحيوان، المعهد القومي للعلوم الفلاحية، الجزائر، البريد الإلكتروني: criquet72@yahoo.fr
اهتمت هذه الدراسة بإبراز كفاءة مثبط النمو Teflubenzuron على يرقات الطور الخامس للجراد. بينت الدراسة أن استخدام هذه المادة بتركيز 2 مغ لا يؤثر في البنية الشكلية الخارجية لقشرة اليرقات. بينما تأثرت البنية الداخلية تأثراً بارزاً. ظهرت تغيرات بارزة في الطبقة الوسطى مقارنة بيرقات الشاهد. وقد أحدثت هذه المادة تفككاً في خلايا النسيج الطلاني للأنبوب الهضمي.

DL 11

تأثير الأشعة ما فوق البنفسجية في نمو الفطر المضاد للحشرات *Metarhizium flavoviride* ضد الجراد الصحراوي *Schistocerca gregaria*. فاطمة الزهراء قارة¹ وبهية دومانجي متيش²، قسم البيولوجية، كلية العلوم البيطرية والزراعة والبيولوجية، جامعة سعد دحلب، البلدة، الجزائر، البريد الإلكتروني: ihcene_faiza@yahoo.fr
الجراد الصحراوي هو واحد من الحشرات المعروفة بكثرة على المستوى العلمي والأكثر انتشاراً في المناطق المغربية والقادر على الاستيلاء على منطقة معينة والانتقال بسرعة كبيرة عبر مناطق شاسعة بعبوره الحدود واحتلاله مناطق بعيدة عن بعضها البعض في مدة قصيرة. أدى اكتشاف مبيدات الحشرات إلى القضاء على الجراد ولكن ليس بصفة نهائية، وأدى كثرة استعمال هذه المبيدات إلى التلوث البيئي. ولهذا توجهت حالياً ورشات البحث نحو البحث الحيوي وبالأخص ما يتعلق منها بالكائنات الحية الدقيقة باستعمال البكتيريا، والفطريات والفيروسات. أسهم هذا العمل في معرفة الفطر *Metarhizium flavoviride* المعرض للأشعة ما فوق البنفسجية (UV) على سلوكية وتطور الفطر المضاد للحشرات ومدى تأثيره في الجراد الصحراوي بتقدير نسب البروتين، السكريات، مكونات الدم والجهاز التناسلي الأنثوي. أظهرت النتائج أن الفطر المدروس ينمو نمواً هائلاً حين تعرضه للأشعة ما فوق البنفسجية وكذلك عند علاج الجراد بهذا الفطر المعرض للأشعة. كما لوحظ انخفاض نسبة البروتينات في الدم بنسبة 3.14 ميكروغرام/ليتر للجراد المعرض مقارنة بالجراد غير المعرض للأشعة (28.4 ميكروغرام/ليتر)، وكذلك انخفاض نسبة السكريات في الدم التي بلغت 10.0 ميكروغرام/ليتر بالجراد المعرض و 40.91 ميكروغرام للجراد غير المعرض للأشعة. كما لوحظ نقص في حجم المبيض عند الانثى المعرضة (50 مم) مقارنة بالأفراد غير المعرضة (82 مم)، ونقص بنسبة مكونات الدم من الناحية الكمية والتنوعية، وبلغ عدد الـ hemocytes عند الأفراد المعرضة حوالي 81 وعند غير المعرضة قُدرت بـ 385.

الجرعة 1 = 10⁶ بوغ/مل، الجرعة 2 = 10⁶ × 2 بوغ/مل، الجرعة 3 = 10⁶ × 4 بوغ/مل مع شواهد (تمت معالجتها بالماء المقطر فقط)، وأشارت النتائج أن نسبة الوفيات تناسبت طردياً مع تركيز الفطر، ثم حسب الجرعة اللازمة لقتل 50% من الجراد. ولمعرفة مدى تأثير الفطر في الأنبوب الهضمي للجراد الصحراوي، تم تحضير قسمين الأول عولج بالجرعة اللازمة للقتل 50 والثاني عولج بالماء المقطر كمشاهد. وبعد 5 أيام من المعالجة، تم نزع الأنابيب الهضمية للحشرات. بعد معاينة مختلف القطع النسيجية عن طريق المجهر الضوئي لوحظ اختلاف في البنية النسيجية للأفراد المعالجة مقارنة بالشواهد.

DL 6

غريبة مخبرية للخواص الإبادية لمستخلصات بعض النباتات على الجراد الأفريقي الرحال *Locusta migratoria* Linne
عبد الله محمد عبد الله¹، ميهان لوفق واسكوفماند²، ميشيل ليكوك² والسيد البشير³. (1) جامعة كردفان، ص.ب. 160، الأبيض، السودان؛ (2) المركز الدولي للتعاون في البحوث الزراعية للتنمية، مونبلييه، فرنسا؛ (3) شعبة وقاية المحاصيل، كلية الزراعة، جامعة الخرطوم، شمبات، السودان.

نالت الطرق البديلة لمكافحة الجراد قدراً كبيراً من الإهتمام في السنوات الأخيرة حيث تم تقييم العديد من المركبات الطبيعية بما في ذلك المستخلصات النباتية كبداية للمبيدات الكيميائية المصنعة، وما زالت الدراسات جارية في تقييم هذه البدائل. تستعرض هذه الدراسة نتائج التقييم الحيوي تحت ظروف المختبر لمستخلصات نباتات *Mucuna pruriens* (Fabaceae)، *Adenium obesum* (Apocynaceae)، *Azadirachta indica* (Meliaceae) و *Calotropis procera* (Asclepiadaceae) على الجراد الأفريقي الرحال *Locusta migratoria* Linne (Orthoptera: Acrididae)، وقد تم إعداد المستخلصات النباتية باستخدام الماء أو الماء والكحول الأيثيلي كمذيبات ومن ثم تم اختبار أثر هذه المستخلصات كمبيدات بالملامسة وكسموم معدية. دونت المعلومات عن الفعل الصارع، نسبة الموت وزمن الموت كمؤشرات للكفاءة. أظهرت النتائج أن مستخلصات *M. pruriens* تعمل بالملامسة وكسموم معدية، وبلغت نسبة الموت 99% عندما تم رش مستخلصه المائي أو المائي الكحولي مباشرة على الجراد. وسجلت نسبة الموت نفسها عندما أطمع الجراد ببادرات القمح المعاملة بالمستخلص المائي الكحولي للنبات *M. pruriens*، وتفوقت مستخلصات هذا النبات في سرعة تأثيرها على مستخلصات *A. indica*. وخلصت هذه الدراسة إلى أن مستخلصات *M. pruriens* تمتلك فاعلية يمكن استعمالها في وقاية النباتات المختلفة.

DL 7

انتشار الجراد الصحراوي *Schistocerca gregaria* Forsk في وقت تجمعه وفي وقت تفرقه في صحراء الجزائر. عتيقة قندوز بن ريمة¹ وبهية دومانجي ميتش². (1) جامعة سعد دحلب، صندوق بريد رقم 09، 09470، الصومعة، البليدة، الجزائر، البريد الإلكتروني: atiguen@yahoo.fr؛ (2) معهد العلوم الفلاحية، الجزائر.

يفرض تجمع الجراد الصحراوي *Schistocerca gregaria* Forsk (Insecta: Orthoptera) الخطير دراسته في وقت تفرقه (أفراد منعزلة) وفي وقت تجمعه (أفراد متجمعة). تقدم في هذا البحث خرائط انتشار الجراد البالغ والحوريات في الجزائر. صممت هذه الخرائط من طرف مؤسسات البحث FAO/COPR (معطيات 1937 إلى 1991). بينت دراسة بيوجغرافية للجراد الصحراوي في الجزائر أن أماكن تكاثرها منتشرة بطريقة تناقلية. في منطقة الغزو، تنتشر أماكن تكاثر الجراد في المناطق الزراعية المتوسطة، وتهدد بذلك كل المحاصيل الزراعية للبلاد. عندما تكون الجراديات في حالة منعزلة فإنها تتكاثر في المناطق الصحراوية (الصحراء الوسطى وأقصى الجنوب الصحراوي الجزائري). تسمح عدة أماكن للجراد الصحراوي بالتكاثر وهذا ما يؤدي إلى ظاهرة التحول الظرفي (منعزلة، متجمعة)، وتشتد هذه الظاهرة عندما تكون بعض السلالات متنقلة. ومنذ الثمانينات، مع التطور الزراعي وخاصة الري بواسطة الرش المحوري في الجزائر، أصبحت هذه الأماكن إطاراً يسمح بالتكاثر والتجمع للجراد الصحراوي بعيداً عن أماكن تواجده المألوفة. وتواجد الجزائر في قلب أماكن تابعة بصفة دقيقة لنشاط الجراد الصحراوي يفسر علاقة البلدان المجاورة لهذه الظاهرة، الشيء الذي يتطلب برنامج مراقبة ومكافحة وكذلك برنامج تبادل معلومات، الشيء الذي يسمح بمكافحة هذه الظاهرة والوقاية منها في الوقت المناسب.

DL 8

تقييم التأثير الحيوي لأربعة أنواع بكتيرية في الجراد الصحراوي *Schistocerca gregaria*. مهند قاسي حكيمة¹ وبهية دومانجي ميتش². (1) قسم البيولوجيا، كلية العلوم، جامعة محمد بوقرة، بومرداس، الجزائر، البريد الإلكتروني: mkbio2005@yahoo.fr؛ (2) INA، الحراش، الجزائر.

منذ عدة قرون، لفت الجراد الصحراوي الانتباه في عدة دول من العالم. عرف تاريخ الإنسانية عدة غزوات للجراد، تسببت في هلاك آلاف الأشخاص، وتعد الجزائر واحدة من هذه الدول المعنية بالغزوات، إذ تأتيها أسراب من الجراد من الدول المجاورة (مالي، النيجر، وموريتانيا). تستعمل تقنيات مكافحة الحديثة مبيدات جد فعالة، يبدي الجراد باستعمالها حساسية

DL 3

قياسات الشكل والنظام الغذائي للجراد الصحراوي *Schistocerca gregaria* في بعض المناطق الجزائرية. بيهية دومانجي متيش، ي. خريوش وس.أ. حمور، قسم علم الحيواني الزراعي والغابي، المعهد الوطني للعلوم الفلاحية، الحراش، الجزائر، البريد الإلكتروني: doumandjimitiche@yahoo.fr

على إثر غزو الجراد الصحراوي *Schistocerca gregaria* (Acrididae: Cyrtacanthacridinae) الذي شهدته الجزائر في شباط/فبراير 2004 والتراجعات اللاحقة وجد أنه من الضروري إجراء دراسة بيئية حيوية (القياسات الشكلية والنظام الغذائي) لهذا النوع في عدة مناطق من الصحراء الجزائرية. تمت دراسة القياسات الشكلية من خلال مقارنة النسبة بين طول الجناح الغمدي وطول الفخذ (غ/ف) ونسبة طول الفخذ مع محيط الرأس (ف/ر). لوحظ بأن الأفراد الملتقطة من منطقة الأغواط (عددها = 12 إناث و 8 ذكور)، بسكرة (27 إناث و 25 ذكور)، الجلفة (7 إناث و 6 ذكور)، أدرار (3 إناث و 8 ذكور)، واد سوف (2 إناث و 26 ذكور) و توقرت (45 إناث و 55 ذكور) كلها في الطور التجمعي ومعدلاتها $0.21 \pm 2.19 \geq \text{غ/ف} \geq 0.99 \pm 2.44$ و $0.12 \pm 3.28 \geq \text{ف/ر} \geq 0.27 \pm 3.47$ عند الإناث، و $0.08 \pm 2.21 \geq \text{غ/ف} \geq 0.08 \pm 2.37$ و $0.09 \pm 3.24 \geq \text{ف/ر} \geq 0.20 \pm 3.48$ عند الذكور. وبناء على منحى القياسات المعروفة يتضح أن أغلبية هذه الأفراد هي في الطور الإنتقالي التجمعي والبقية في الطور التجمعي. تم دراسة النمط الغذائي في محطات بودة وباعمر المتواجدة بمنطقة أدرار (11°0' شرقاً، 27°49' شمالاً) على بعد 1543 كم جنوب العاصمة الجزائر. تم اختيار هذه المنطقة للتواجد المستمر لهذا الجراد بها نظراً لتوفرها على المرشات المحوية. في محطة بودة (واحة نخيل تبعد 20 كم على مدينة أدرار) سجل تواجد خمسة أنواع من النباتات تم التعرف عليها في مخزجات الذكور (عددها = 15) والإناث (عددها = 10). نخيل البلح هو النبات الأكثر إستهلاكاً بنسبة 62.86% عند الذكور و 62.05% عند الإناث. النوع الثاني *Arundo plinii* (الفصيلة الكنائية) بنسبة 27.14% للذكور و 32.55% للإناث. الأنواع الأراضية *Arachis hypogaea* (فصيلة الفوليات)، النعناع *Mentha specta* (الفصيلة الشفوية) و *Punica granatum* أقل تناولاً. في محطة باعمر (حقل صغير توجد به بعض الزراعات المعاشية والحبوب يبعد 45 كم عن جنوب شرق مدينة أدرار)، تم التعرف على ستة أنواع من النباتات في مخزجات الإناث (العدد = 14) وأربعة عند الذكور (العدد = 15). النباتات المفضلة عند الإناث هي *Arundo dorax* بنسبة 57.18% والخمض *Solsola vermiculata* (الفصيلة الوزية) بـ 12.94% والبندورة *Lycopersinacum esculatum* (الفصيلة الباننجانية) بـ 11.93%. أما عند الذكور، فإن *Arundo dorax* يحتل المرتبة الأولى في منحى الغذاء (83.53%)، متبوعاً بـ *S. vermiculata* (83.53%) ونخيل البلح (7.62%).

DL 4

دراسة نمو المبايض للجراد البربري *Calliptamus barbarus* تحت الظروف المناخية شبه الجافة وشبه الرطبة في الجزائر. عبد المجيد بن زارة¹ والآن لوفو². (1) مخبر علم الحشرات المعهد العالي للعلوم الفلاحية، الحراش، الجزائر، البريد الإلكتروني: benzaraabdelmadjid@yahoo.fr؛ (2) مخبر ESE، عمارة 362، جامعة باريس F91405، ارسى، فرنسا. إن تحديد التطور الزمني لخصوبة الجراد البربري *Calliptamus barbarus* (Orthoptera: Acrididae) على مستوى المناخين شبه الجاف وشبه الرطب معروفاً جيداً إلى يومنا هذا. يبدو أن هناك فرق في إنتاج البويضات حيث أنه معتبر في المناخ الشبه الجاف مقارنة بالمناخ شبه الرطب. يصل الحد الأقصى لعدد أنابيب المبيض إلى 56 في المناخ الرطب و 58 في المناخ الجاف، وأن وضع البيض لا يتجاوز المرتين في كلا المناخين. وظاهرة امتصاص البويضات مرتفعة في حالة الظروف غير الملائمة حيث نجد بويضات مخزونة بالكَم المبيضي لكن بعدد أقل من آثار التبويض، وهذا يعني أن الأنثى سبق لها وأن وضعت بيضها. ظاهرة البيض المخزون تبدأ من شهر أيلول/سبتمبر وتستمر إلى غاية تشرين الأول/أكتوبر بغض النظر عن المناخ. وبالنسبة للمردود البويضي فقد يصل إلى 79% في شبه الجاف و 94% في شبه الرطب.

DL 5

دراسة تأثير الفطر المضاد الحشري *Metarhizium anisopliae* var. *acridium* في الجراد الصحراوي *Schistocerca gregaria*. بيهية دومانجي متيش¹ وفاطمة الزهراء بساعد². (1) قسم علم الحيوان الزراعي والغابي، المعهد القومي للعلوم الفلاحية، الحراش، الجزائر؛ (2) قسم البيولوجيا كلية العلوم، جامعة محمد بوقرة، ص.ب. 35000، بومرداس، الجزائر، البريد الإلكتروني: bissaad@yahoo.com

ساهمت مكافحة الكيماوية في التقليل من أضرار الجراد الصحراوي باستخدام العديد من المبيدات، لكنها أيضاً أثرت سلباً في البيئة من خلال تسميم الإنسان والحيوان والتقليل من الحشرات النافعة. ولإيجاد طريقة أخرى لحماية المزروعات ضد هذه الآفة، تم اختبار فطر مضاد حشري *Metarhizium anisopliae* عزل من المادة "العضلة الخضراء" المنتجة من طرف مخابر LUBILOSا. لهذا الغرض تم معالجة الحوريات في الطور الخامس عن طريق الهضم بثلاث جرعات، إذ كانت

DL 1

تصنيف فصيلة (Acridoidea: Orthoptera) Pamphagidae من منطقة فزان - ليبيا. عبد القادر علي العجيلي ومحمد كامل عثمانى، قسم العلوم العام، كلية العلوم الهندسية والتقنية، جامعة سبها، ص.ب. 68، براك الشاطي، ليبيا، البريد الإلكتروني: dr_ajaili@yahoo.com، dr_ajaili@hotmail.com

اعتمدت هذه الدراسة على ستة أجناس من فصيلة Pamphagidae، وتم في البداية تقديم نبذة مختصرة للفصيلة ومفاتيح تحت الفصيلة، والأجناس التابعة لهذه الفصيلة من منطقة فزان الليبية. وبنيت هذه الدراسة للتمييز ما بين تحت الفصيلة على شكل وتركيب الأجزاء التناسلية للجراد والتطاطات من حيث وجود أو غياب الأسنان أو الدرناات على الجانب العلوي للقصبية الوسطى، وجود أو غياب شوكة القمة الخارجية للقصبية. كما بينت على حالة الصمام البطني لألة وضع البيض بها أو بدون خد أو سن ومنتسعة بقوة أو خفيفة الإتساع، وحالة آلة وضع البيض طويلة أو قصيرة، وشكل ردوب الكيس المنوي، وجود أو غياب الأشواك على الحافة الخلفية للصفحة تحت الشرجية للأنثى. واستخدمت للتمييز بين الأجناس، حالة الجبهة مائلة أو مستقيمة، وحالة الضلوع الأمامية مسطحة أو محززة، وحالة قرون الإستشعار، شكل ونسبة الطول والعرض للظهر الأمامي، ونسبة طول "البروزونا" و"الميتازونا" من الظهر الأمامي "البرونوتم"، وجود أو غياب سهيم القص (Carinae) الوسطى والجانبية على الظهر الأمامي. كما استخدم لذلك عدد الشقوق التي تقطع سطح الظهر الأمامي، سهيم القص به إخدود أو بدون إخدود، وحالة ذروة الظهر الأمامي مشقوقة شق سطحي أو عميق، وشكل بروز القص الأمامي، وحالة سهيم القص الوسطى ثنائية الأسنان أو ثلاثية الفصوص على "البروزونا"، وشكل بروز القص الأمامي، وشكل الأجنحة الأمامية، وجود أو غياب الفيشة (الصفاق) على الأجنحة الخلفية، وحالة الفخد الأمامي طويلة وضيقة أو قصيرة وواسعة، وشكل الصفحة تحت الشرجية والصفحة فوق الشرجية والقرون الشرجية للذكر، وحالة المنطقة العليا من عضو التناسلي الذكري متسعة أو ضيقة، وشكل الحافة الخلفية للصفحة تحت الشرجية للأنثى، وجود الأشواك على كل الحافة الخلفية أو محدودة بالحافة الجانبية فقط، وحالة صمامات آلة وضع البيض مسننة ومدببة أو ملساء، علاقة طول "ابوديم" (Apodeme) الجانبية بالصمامات الظهرية.

DL 2

تأثير نوعين من الفطريات مضادة للحشرات (*Beauveria bassiana* و *Metarhizium anisopliae*) في بعض الظواهر النزيولوجية للجراد الصحراوي *Schistocerca gregaria*. بهية دومانجي متيش، صلاح الدين دومانجي، قايد نريمان وحمور سامية إيمان، قسم علم الحيواني الزراعي والغابي، المعهد الوطني للعلوم الفلاحية، الحراش، الجزائر، البريد الإلكتروني: doumandjimitiche@yahoo.fr

تم دراسة تأثير نوعين من الفطريات *Beauveria bassiana* و *Metarhizium anisopliae* في بعض العوامل النزيولوجية للجراد الصحراوي كالنتفس، تواتر ضربات القلب ودراسة خلايا الدم. تم الحصول على الجراد المستخدم في التجربة من منطقة أدرار، والفطر *Beauveria bassiana* تم عزله من نحل وجد في بركة بمنطقة رغاية في أيلول/سبتمبر 2003 الذي استخدم بتركيز 10×2.84 بوغ/مل ماء مقطر، وهو التركيز اللازم لقتل 50% من الجراد المحسوب سابقا. بالنسبة إلى *Metarhizium anisopliae* تم الحصول عليه في أيار/مايو 2005 من المعهد الوطني لوقاية النباتات على شكل سائل مضاد حشري تحت إسم "العضلات الخضراء" هو عبارة عن معلق زيتي استخدم بتركيز 10×14 بوغ/مل. المعالجة تمت عن طريق اللمس. أظهرت النتائج اضطرابات فزيولوجية إبتداء من اليوم الثالث بعد المعالجة المتمثلة إنخفاض معنوي في عند انفتاح الثغور من 85.10 إلى 44.08 فتحة/د ومن 80.42 إلى 38.40 فتحة/د عند الإناث والذكور، على التوالي، عند المعالجة بالفطر *B. bassiana*. وبانخفاض من 85.88 إلى 42.38 فتحة/د ومن 85.33 إلى 44.08 فتحة/د، على التوالي عند الإناث والذكور المعالجة بـ *M. anisopliae*. ولوحظ هبوط مماثل في ضربات القلب بعد المعالجة بالفطر *B. bassiana* من 78.09 إلى 35.65 ضربة/د بالنسبة للإناث ومن 77.42 إلى 37.12 ضربة/د عند الذكور. سببت المكافحة بالفطر *M. anisopliae* هبوطا أيضا في ضربات القلب من 80.30 إلى 44 ضربة/د عند الإناث ومن 82.05 إلى 44.25 ضربة/د عند الذكور. ومن الناحية الكيفية، سمحت دراسة خلايا الدم من تحديد ثلاثة أصناف من الخلايا: للمفاويات البدائية، البلازمية والمحبية. وسببت المكافحة بالفطر *B. bassiana* تخريبا في بنية الخلايا. أما من الناحية الكمية، فقد لوحظ في اليوم الثالث بعد المعالجة هبوطا كبيرا في نسب مختلف أصناف الخلايا للمفاوية من 113.25 إلى 19.50 خلية لمفاوية بدائية/5 ميكروليتر من السائل للمفاوي ومن 151.25 إلى 23.25 خلية بلازمية/5 ميكروليتر من السائل للمفاوي.

الجراد الصحراوي

50 نوعاً تنتمي لحوالي 30 جنساً من هذه العائلة، يعدّ بعض هذه الأنواع آفات مهمة على المزروعات أو أشجار الغابات، والأخر يتغذى على نباتات برية.

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الكمبيوتر وعلوم الحشرات. أياد يوسف اسماعيل، كلية التربية، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: aeadismail@yahoo.com

منذ عام 2000 تم إعداد 15 قرص علمي وتعليمي في مجال علوم الحشرات في مختبر الوسائط المتعددة بقسم علوم الحياة في كلية التربية بجامعة الموصل. ففي مجال الإعجاز العلمي للقرآن الكريم في علوم الحشرات تم إعداد قرصين هما خلق الذباب صفحة من الإعجاز العلمي للقرآن الكريم والعلاجات بمنتجات نحل العسل: من الإعجاز العلمي للقرآن الكريم (2005). وفي مجال التعليم والمعلومات تم إنتاج الأقراص الليزرية التالية: بحوث آفات المواد المخزونة في العراق: قاعدة بيانات (2000)، تدريس مختبر علم الحشرات العملي المستند على الحاسوب (2003)، حقائق ومعلومات عن آفة السونة (2005)، محاضرات مبيدات الآفات، ومحاضرات تصنيف الحشرات وجمع وحفظ وتشخيص ودراسة الحشرات (2006). وفي مجال الانترنت تم إعداد الأقراص الليزرية التالية: بوابة الانترنت إلى مواقع علوم النحل (2004)، بوابة الانترنت إلى مواقع علوم الحشرات (2005)، بحوث آفات المواد المخزونة المنزلة من الانترنت (2005)، محاضرات في وقاية منتجات الأغذية والأعلاف ومحاضرات الفلسفة البيئية للحشرات ومفردات علوم الحشرات في العالم من الانترنت، وأخيراً مجموعة أيهاب بكر للبرامجيات العلمية (2006).

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دراسة بيولوجية لفراشة اللوز الحرشفية *Aporia crataegi* L. في المنطقة الوسطى في سورية وطرائق مكافحتها. وجيه قسيس وأمني شالو، كلية الزراعة، جامعة دمشق، سورية، البريد الإلكتروني: lamsamer@scs-net.org
تمت دراسة دورة حياة فراشة اللوز الحرشفية *Aporia crataegi* L. (Lepidoptera: Pieridae) في المنطقة الوسطى خلال الفترة ما بين 2003-2006. لوحظ أن هذه الحشرة تهاجم إضافة لأشجار اللوز التفاحيات والزعرور والمحلب والصفصاف. تبدأ الفراشات بالتزاوج ووضع البيض ابتداءً من شهر نيسان/أبريل، تفقس البيوض بعد 13-15 يوماً عن يرقات صغيرة (تمر بخمسة أعمار يرقية متداخلة). تبدأ اليرقات بمهاجمة الأوراق وتمر بانسلاخين متتاليين لتصل إلى العمر اليرقي الثالث في منتصف شهر حزيران/يونيو، وتقوم بنسج شبكة حريرية على هيئة أعشاش حريرية مثبتة على الأفرع الصغيرة، وغالباً ما تكون في قمم الأشجار، وتدخل هذه اليرقات في طور سكون صيفي خريفي. في بداية شهر شباط/فبراير من العام التالي تعاود هذه اليرقات نشاطها وذلك مع بداية انتفاخ براعم اللوز، وتعد هذه المرحلة خطرة جداً لأن اليرقات تتغذى بشراهة على البراعم الزهرية والورقية وتؤدي إلى تلف المحصول. بينت الدراسة أن كثافة أعداد الحشرة متعلق بعدة عوامل أهمها: (1) الطفيليات، حيث بلغت نسبة التطفل 29، و21 و 41.3% في الأعوام 2004، 2005 و 2006، على التوالي، وكان من أهمها *Apantaeles* spp. (2) وجود تشوهات الأجنحة أو فقد إحداها أو الانسلاخات غير الكاملة التي قد تسبب الموت أو عم التكاثر، (3) إصابات مرضية تسبب جفاف العذارى وموتها وكذلك تساقط الأجنحة وعدم القدرة على الطيران، (4) تفوقت نسبة القتل بالمبيدات الحشرية بمقدار 10% عن العوامل المميّنة الطبيعية.

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دراسة عن أهم آفات اللوز في المنطقة الوسطى وطرائق مكافحتها. وجيه قسيس وروضة سكر، كلية الزراعة، جامعة دمشق، سورية، البريد الإلكتروني: lamsamer@scs-net.org
تتركز زراعة أشجار اللوز بشكل رئيسي في لسورية في المنطقة الوسطى (حمص ومحيطها). تهاجم أشجار اللوز العديد من الآفات الحشرية وهذا يؤثر على الانتاج وعلى حياة الأشجار. من أكثر الآفات الحشرية أهمية على اللوز *Aporia crataegi*، *C. tenebriones*، *Capnodis carbonaria*، *Eurytoma amygdali* و *Lymantria lepidicola*. يعد دبور ثمار اللوز *E. amygdale* آفة حقيقية على اللوز حيث ظهرت الإصابة بنسبة 90% في عام 2002 وكانت الإصابة بها تتبع بالإصابة بدودة ثمار الخوخ. تمت مكافحة الكيماوية للدبور باستخدام المبيدات الحشرية التالية: Desis D، Zenet، Agrotioel و Mezorol. وأنت هذه المعاملة إلى خفض الإصابة إلى 10%. حالياً يتم التعاون بين كلية الزراعة بجامعة دمشق وبين المركز الفرنسي للأبحاث الزراعية (INRA) في محاولة لتحديد تاريخ أول ظهور للحشرة الكاملة في الحقل وذلك باستخدام المصائد الفرمونية الجنسية لكي نعرف أفضل وقت لمكافحة هذه الحشرة.

E 61

تقصي فراشات الديدان القارضة في شمال العراق. هيثم محيي الدين الجلال، كلية الزراعة، جامعة الموصل، العراق، البريد الإلكتروني: d.haitham@yahoo.com

بلغ مجموع صيد كاملات الديدان القارضة التابعة للعائلة Noctuidae بالمصائد الضوئية 3978 في مناطق الدراسة الثلاث (الرشيدية والشلالات ويارمجة) خلال عام 2003، توزعت على 12 نوعاً، ثلاثة منها أرضية وهي: الدودة القارضة السوداء (*Agrotis ipsilon* (Hufn.))، دودة اللفت (*A. segetum* (Schiff.)) والدودة القارضة البنية (*A. spinifera* (Hubn.)) بنسب صيد بلغت 19.10، 7.74 و 5.15% من مجموع الصيد الكلي، على التوالي، وتسعة أنواع متسلقة وهي: عثة الأس (*Anua trihaca* (Cr.))، دودة ورق الرمان (*Dysgonia parallela* (Guen.))، دودة جوز القطن الشوكية (*Earias insulana* (Boisd.))، دودة ثمار الطماطم/البندورة (*Heliothis armigera* (Hubn.))، دودة الذرة (*Mythimna loreyi* (Dup.))، حفار ساق الذرة (*Sesamia cretica* (Led))، دودة الشوندر السكري/البنجر (*Spodoptera exigua* (Hubn.))، قارضة التبغ (*S. litura* (Fab.)) ودودة اللهانة القياسية (*Trichoplusia ni* (Hubn.)) بنسب صيد بلغت 2.46، 2.86، 12.56، 3.24، 6.33، 7.41، 15.23، 7.39 و 10.48%، على التوالي. وتفوقت منطقتي الرشيدية ويارمجة في معدلات الصيد معنوياً على منطقة الشلالات عند مستوى احتمال 0.05. بدأ أول ظهور للكاملات في المصائد في النصف الأول من شهر شباط/فبراير، وسجل آخر حضور لها في النصف الثاني من تشرين الثاني/نوفمبر، في حين خلت المصائد بصورة شبه كلية في فصل الشتاء، ووجد هناك ارتباط معنوي موجب بين كثافة الصيد للكاملات الديدان القارضة، ومعدل درجات الحرارة، وارتباط سالب وغير معنوي مع كل من الرطوبة النسبية والأمطار.

E 62

خنفاص العصاراة Nitidulidae والمدى العوائل لها في الساحل الليبي. نجلاء الزائدي وحلومة كره، قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: najla_elzaidi@yahoo.ca

تعد الخنفاص شاربة العصاراة Sap beetles التابعة لعائلة Nitidulidae من أهم آفات المحاصيل الزراعية ومنتجاتها في الحقل، وفي المخازن، وفي الأسواق. نفذت دراسة تحديد المدى العوائل لهذه الخنفاص على محاصيل الفاكهة والخضر في 17 منطقة في الساحل الليبي (تارغاء، مصراته، زيتن، وادي كعام، الخمس، بيس، القربولي، وادي الربيع، تاجوراء، عين زاره، جنزور، السواني، الزهرة، الزاوية، صبراتة، العجيلات، الجميل). بينت نتائج الدراسة أن هذه الخنفاص متواجدة في جميع مناطق الحصر ولها مدى عوائل واسع وهي تصيب ثمار 20 عائلاً نباتياً، هي: أشجار فاكهة (تمور النخيل *Pheonix dactylifera* L.، مشمش *Prunus armeniaca* L.، خوخ *Prunus persica* L.، برقوق *Prunus domestica* L.، تفاح *Malus domestica* Borkh.، برتقال *Citrus sinensis* L.، *Citrus reticulata* L.، ليمون *Citrus limon* L.، رمان *Punica granatum* L.، تين *Ficus carica* L.، كمثرى *Pyrus communis* L.، عنب *Vitis vinifera* L.، جوافة *Psedium guajava* L.، فراولة *Fragaria vesca* L.، زيتون *Olea europea* L.، ومحاصيل خضر (البندورة/الطماطم *Lycopersicon esculentum* Miller.، البصل *Allium cepa* L.، البطيخ الأحمر *Citrullus lanatus* (Thunb) كوسا *Cucurbita pepo* L.)، والقرع العسلي (*Cucurbita moschata* (Duchesne)). تفاوتت نسب الإصابة بالخنفاص من 68-100% على ثمار أشجار الفاكهة، وكانت ثمار الرمان، النخيل، المشمش، الخوخ، التفاح، التين، البرتقال، والطماطم/البندورة الأكثر إصابة وفي جميع مناطق الحصر. عرفت سبعة أنواع من خنفاص العصاراة المتلازمة مع الثمار وكان أكثرها سيادة *Carpophilus hemipterus* و *C. dimidiatus*. كما أظهرت النتائج أن للخنفاص القدرة على إصابة الثمار السليمة غير الناضجة والناضجة وكذلك الثمار المتساقطة في الحقل، بالإضافة إلى وجودها في الثمار المعروضة للبيع في الأسواق، مما يقلل من قيمتها التجارية. كما تدل النتائج أن خنفاص العصاراة متواجدة على مدار السنة. وأن عوائلها في إزدياد إن لم يعمل لها برنامج متكامل للسيطرة عليها.

E 63

أنواع الفراش الليلي في الأردن (Lepidoptera: Noctuidae). أحمد كاتبه بدر. قسم وقاية النبات، كلية الزراعة، الجامعة الأردنية، عمان 11942 الأردن، البريد الإلكتروني: Ahmadv@ju.edu.jo

درست عينات الفراش الليلي التابعة لعائلة Noctuidae من رتبة حرشفية الأجنحة Lepidoptera المحفوظة بمتحف الحشرات بكلية الزراعة في الجامعة الأردنية بالإضافة إلى العينات المحفوظة بوزارة الزراعة، والعينات التي جمعها الباحث منذ 1992. تم تحضير قائمة بأنواع هذه العائلة بناء على العينات المدروسة وتلك التي سجلت سابقاً في الأردن. تم حصر أكثر من

وجد أن معظم المواد هي أحادية الألكان غير المشبعة. تمثلت تشكيلة هذه المواد من سلسلة أحادية الألكان غير المشبعة C24 إلى C 36 (73.9%) عند *Pamphagus elephas*، ومن C24 إلى C 34 عند *Pamphagus marmoratus* (79.9%)، وأحادي الميثيل 8.8% عند *Pamphagus elephas* و 4.8% عند *Pamphagus marmoratus*، وثنائي الميثيل 2.1% عند *Pamphagus elephas* و 6.6% عند *Pamphagus marmoratus*، وثلاثي الميثيل 4.1% عند *Pamphagus elephas* و 4.3% عند *Pamphagus marmoratus*. وجد كذلك فرق كمي عند كلا الجنسين لكلا النوعين. إن النتائج التي تم الحصول عليها مهمة ويمكن أن تستعمل هذه الطريقة الكيميائية-التصنيفية للفصل بين الأنواع خاصة تلك التي تتشابه في الشكل الظاهري.

E 59

حصص للحشرات المرتبطة بالنبات الشوكي (*Cynara sp.*). عادل حسن أمين، قسم وقاية النبات، كلية الزراعة، جامعة صلاح الدين، أربيل، العراق، البريد الإلكتروني: nadeemramadan@yahoo.com، saidkhalid88@yahoo.com
أجريت الدراسة الحالية خلال الفترة من أيلول/سبتمبر 2001 - آب/أغسطس 2003، وذلك بهدف حصر أنواع الحشرات المرتبطة بالنبات الشوكي *Cynara sp.*، وكذلك دراسة العلاقة بين هذه الحشرات والنبات العائل. أوضحت النتائج وجود 27 نوعاً من الحشرات تتبع 19 فصيلة و 7 رتب، مرتبطة بالنبات *Cynara sp.* وتضم 9 أنواع من رتبة غمدية الأجنحة (Coleoptera)، شملت النوعان *Agapanthia annularis* L. و *A. cardui* L. من فصيلة Cerambycidae، النوعان *Coccinella septempunctata* L. و *Phyllotreta sp.* من فصيلة Chrysomelidae، النوعان *C. novemnotata* L. و *Coccinellidae* من فصيلة *Lixus sp.* و *Larinus sp.* من فصيلة Coccinellidae، والنوع *Potosia morio* F. من فصيلة Scarabaeidae. كما تضمنت نوعان من الذباب هما *Acanthophilus helianthi* Rossi و *Chaetorellia carthami* Stack من فصيلة Tephritidae ورتبة ذات الجناحين (Diptera). وشملت أيضاً 3 أنواع من رتبة نصفية الأجنحة (Hemiptera) وهي *Anthocoris sp.* من فصيلة Anthocoridae و *Spilostethus pandurus* Scop. و *Lygaeidae* و *Dolycoris baccarum* L. من فصيلة Pentatomidae. كما سجلت 3 أنواع من رتبة متشابهة الأجنحة (Homoptera)، منها نوعان من حشرات المن *Aphis compositae* Theobald و *A. craccivora* Koch من فصيلة Aphididae والنوع *Empoasca sp.* من فصيلة Cicadellidae. وتضمنت النتائج أيضاً 3 أنواع من رتبة غشائية الأجنحة (Hymenoptera)، منها النوعان *Andrena sp.* و *Apis mellifera* L. من فصيلة Apidae والنوع *Megachile sp.* من فصيلة Megachilidae و 6 أنواع من رتبة حرشفية الأجنحة (Lepidoptera)، النوعان *Pieris rapae* L. و *Colias croceus* Fourc. من فصيلة Pieridae، النوع *Pyrgus sp.* من فصيلة Hesperidae، النوع *Vanessa cardui* L. من فصيلة Nymphalidae، النوع *Pyronia sp.* من فصيلة Satyridae والنوع *Macroglossa stellatarum* L. من فصيلة Sphingidae. وتضمنت رتبة هديبة الأجنحة (Thysanoptera) نوعاً واحداً هو *Thrips sp.* من فصيلة Thripidae. وأوضحت نتائج الدراسة إمكانية استخدام بعض هذه الأنواع الحشرية في برامج مكافحة الحيوية للنبات الشوكي *Cynara sp.* وهذه الأنواع هي: *Larinus sp.*، *Lixus sp.*، *Chaetorellia carthami*، *Potosia morio* و *Agapanthia annularis* و *A. cardui*.

E 60

التنوع وحدود البيئة الحيوية لمستقيمات الأجنحة بمغنية في منطقة تلمسان (الجزائر). أمينة دمرجي، قسم البيولوجيا، كلية العلوم، جامعة أبي بكر بلقايد، ص.ب. 119، تلمسان، الجزائر، البريد الإلكتروني: damerdji_halim@yahoo.fr
تم دراسة التنوع لنظام مستقيمات الأجنحة الموجودة بمغنية في منطقة تلمسان خلال الفترة ما بين آذار/مارس وأيلول/سبتمبر 2005، وقدرت الثروة النوعية لتلك الحشرات الملاحظة بـ 18. بين تحليل هذه المجموعة وجود نوعان بنسبة قليلة، 6 أنواع موجودة بتكرار متوسط و 10 أنواع موجودة بتكرار مرتفع. تغيرت أهمية مستقيمات الأجنحة بناء للمحطات وحسب المواسم والشهور. ففي الربيع، تم ملاحظة 7 أنواع في المحطة الثانية (طريق صبرة)، وفي الصيف تم ملاحظة 12 نوعاً في المحطة الأولى (سيدي بلخير). أما في آذار/مارس، نيسان/أبريل، أيار/مايو وحزيران/يونيو فقد تم ملاحظة نوعان في المحطة الثالثة (حمام الشيفر). تمثل تكرار *Calliptamus barbarus* (Acridae) بـ 61.53% في المحطة الأولى و 38.46% في المحطة الثانية، ولكنها لم تلاحظ في المحطة الثالثة. وبلغ تكرار *Oedipoda fuscocinta* 53.84% في المحطة الأولى، ولكنها لم تكن موجودة في المحطتين الثانية والثالثة. ولم تتواجد *Oedipoda mintata* في المحطة الأولى، ولكنها بلغت 18.42% في المحطة الثانية. وبلغ نسبة التكرار 0.59% للأنواع الثلاثة التالية في المحطة الأولى: *Tmethis maroccanus* و *Anacridium aegyptium*، ونفس النسبة وجدت لثلاثة أنواع من *Gryllidae* في المحطة الأولى، ولكن لم تشهد هذه الأنواع في المحطتين الثانية والثالثة.

E 55

دراسة بيولوجية وبيئية لفصيلة Pamphagidae من رتبة Orthoptera المنتشرة بالجزائر. مصطفى بونشادة¹ وصلاح الدين دومنجي². (1) قسم البيولوجيا، كلية العلوم، جامعة فرحات عباس، سطيف، الجزائر، البريد الإلكتروني: Bounechadam@yahoo.fr؛ (2) المعهد القومي للعلوم الزراعية، الحراش، الجزائر.
تعد فصيلة Pamphagidae (Orthoptera) من أقل الأنواع عددا في رتبة مستقيمات الأجنحة، وصنف حتى الآن 300 نوعاً في العالم. ينحصر إنتشار هذه الأنواع في المناطق الجافة (أفريقيا، جنوب أوروبا وآسيا). صنف في الجزائر حتى الآن 14 نوعاً تتبع هذه الفصيلة. ولم تزل المعلومات حول هذه الفصيلة غير معروفة في الجزائر. وتهدف من خلال هذا البحث إلى إعطاء معلومات حيوية وبيئية ووصف للأنواع المنتشرة في الجزائر.

E 56

حياتية ومقاومة ذبابة الأفرع الغضة *Atherigona soccata Rondani*. حميد حسين محمد¹ وعادل اسماعيل النخلي². (1) قسم وقاية النبات، كلية الزراعة، أبو غريب، بغداد، العراق، البريد الإلكتروني: alkarbolihameed@yahoo.com؛ (2) محافظة تعز، الضبوعة السفلى، اليمن.

تعتبر ذبابة الأفرع الغضة *Atherigona soccata Rondani* (Diptera: Muscidae) من الآفات المهمة التي تهاجم بادرات الذرة البيضاء والصفراء والدخن وخاصة في العديد من دول آسيا وأفريقيا. وبالنظر لعدم وجود دراسات سابقة حول هذه الحشرة فقد تم تنفيذ هذه الدراسة التي تهدف إلى التعرف على بعض الجوانب الحياتية لهذه الحشرة وطبيعتها ضررها ومقاومتها. تعد ذبابة الأفرع الغضة من الأنواع الجديدة التي تم تسجيلها لأول مرة في العراق والتي سببت موت القمة النامية للذرة البيضاء وكذا على نباتات الذرة الصفراء والسفرندا. البيوض متطاولة الشكل لونها أبيض يتراوح طولها ما بين 1.25-1.30 ملم تقريبا. تبدأ الإصابة بوضع البيوض على البادرات خلال الأسبوع الأول من الإنبات وخاصة الورقتين الثالثة والرابعة التي تميزت بأعلى عدد للبيوض. اليرقات دودية الشكل يتراوح طولها ما بين 1.5 إلى 7.8 ملم، بيضاء كريمية اللون. تظهر أعراض الإصابة بصورة مبكرة بشكل ذبول القمة النامية وتكون فروع جانبية. كما لوحظ بأن حوالي 93% من اليرقات قد تعذرت في منطقة التاج وأن طول فترة العذراء 7 أيام. لم تظهر البالغات آلية عدم التفضيل لوضع البيض بين الأصناف المدروسة، ولم تلاحظ هناك فروقات بين معدلات أعداد اليرقات بين الأصناف المدروسة. ويعد هذا مؤشرا على حساسية هذه الأصناف للإصابة بالحشرة. وكان المعدل العام للنسب المؤية للإصابة على جميع الأصناف 66%، وأن الإصابة بهذه الحشرة تؤدي إلى موت القمة للبادرات أكثر مما هو عليه في حالة الإصابة بحفار ساق الذرة (*Sesamia cretica* Led.).

E 57

تأثير العوامل المحيطة في أعداد حشرة *Brevicoryne brassica* L. على محصول الكانولا في إقليم فارمين، إيران. أ.أ. كيهانين، معهد أمراض وحشرات النبات، ص.ب. 1454، طهران 19295، إيران، البريد الإلكتروني: akeyhanian@yahoo.com

تعتبر حشرة المن *Brevicoryne brassica* L. آفة رئيسية على نبات "الكانولا" والتي تقلل من نوعية وكمية المحصول نتيجة لإمتصاصها عصارة النبات. بينت الدراسات الحقلية خلال الفترة ما بين 2001-2003 أن نشاط حشرة *B. brassica* يتباين تبعاً للمناطق المختلفة من إيران. ولقد وجد أن الحشرة تبدأ نشاطها في منطقة طهران، إقليم فارمين بتأسيس مستعمراتها على أشتال "الكانولا" (المحصول الشتوي) خلال شهر تشرين الأول/أكتوبر وتنتشر بعد ذلك في شهر كانون الأول/ديسمبر وشباط/فبراير حسب ظروف المناخ. وكان أعلى تعداد للحشرة تُد رصد في شهر نيسان/أبريل وأيار/مايو، وبعد ذلك تناقص تدريجياً. يعتمد تكاثر الحشرة على عدة عوامل مثل الحرارة والرطوبة وسطوع الشمس. وباستخدام تحليل معامل المسار للعوامل غير الحيوية التي تؤثر في أعداد حشرة *B. brassica* على "الكانولا"، وجد أن لدرجة الحرارة الدنيا، ونسبة الرطوبة الدنيا وسطوع الشمس لهما أثر مباشر على أعداد الحشرة. وفي هذه الدراسة وجهت الجهود لمعرفة آثار العوامل غير الحيوية على أعداد الحشرة.

E 58

دراسة مقارنة لتكوين المواد الهيدروكربونية الموجودة على جليد كل من جنذب *Pamphagus marmoratus*. فريدة بنية¹ ومصطفى بونشادة². (1) قسم العلوم الزراعية، كلية العلوم، جامعة فرحات عباس، سطيف؛ (2) قسم البيولوجيا، كلية العلوم، جامعة فرحات عباس، سطيف، الجزائر، البريد الإلكتروني: Bounechadam@yahoo.fr
درس تكوين المواد الهيدروكربونية الموجودة على جليد الذكور والإناث لكل من جنذب *Pamphagus elephas* و *Pamphagus marmoratus* (Orthoptera, Pamphagidae) بواسطة Gas chromatography و Mass spectrometry.

و50.50% كنسبة من الوزن الاجمالي، بينما كانت في الزراعة الخريفية 18.52% و 22.62%، على التوالي. وجد أيضا ان الدرنات المتضررة كانت من الفئات الوزنية الصغيرة إذ مثلت أكثر من 50% من جميع الفئات الوزنية للدرنات، وأن نسبة الأذى (Injury) تزداد بزيادة الفئات الوزنية. كما يمكن تحديد الضرر من خلال عدد الثقوب فقط دون الحاجة إلى تقطيع الدرنات وقياس أطوال الثقوب فيها.

E 52

تحديد قيم بعض المؤشرات المورفولوجية والبيولوجية لدى سلالة فراشة الطحين (*Ephestia kuehniella* Zell) وطفيل اليرقات (*Bracon brevicornis* Wesm) المرباة في مركز مكافحة الحيوية بالحسكة. روضة الهاشمي¹ ولؤي أصلان².
(1) مخبر تربية الأعداء الحيوية بالحسكة، الحسكة، سورية؛ (2) كلية الزراعة، قسم وقاية النبات، جامعة دمشق، سورية، البريد الإلكتروني: louai@arabscientist.org

درست خلال عام 2005 بعض المؤشرات المورفولوجية والبيولوجية لدى سلالة فراشة الطحين (*Ephestia kuehniella* Zell) وطفيل اليرقات (*Bracon brevicornis* Wesm) التي تمت تربيتها في مركز مكافحة الحيوية بالحسكة بهدف تحديد قيم هذه المؤشرات ضمن ظروف التربية المخبرية. تبين من خلال الدراسة البيولوجية للعائل الحشري البديل (فراشة الطحين) أن دورة حياة الفراشة تستمر حوالي 96.1 يوماً ضمن ظروف التربية المخبرية. كان الفرق ظاهرياً بين عمر الذكر والأنثى، الأمر الذي يشير إلى تماثل الفترة التي تعيشها ذكور وإناث فراشة الطحين. كما تبين من خلال الدراسة البيولوجية للطفيل وجود فروقات معنوية بين عمر الذكر والأنثى، فقد بلغ عمر الذكر 0.15 ± 3.3 يوماً، والأنثى 0.5 ± 6.3 يوماً، حيث تموت أغلب الذكور بعد خروجها من طور العذراء بنحو 3 أيام بعد التزاوج، في حين تستمر الإناث بالعيش إلى ما بعد التزاوج ووضع البيض بنحو 6 أيام، عند درجة حرارة 28 ± 1 °س. أما مدة التطور الجنيني فقد بلغت حوالي 0.11 ± 1.3 يوماً، ومدة التطور اليرقي قرابة 0.18 ± 3.4 يوماً، ومدة طور العذراء قرابة 0.35 ± 11.1 يوماً.

E 53

المساهمة في دراسة البيئة الحيوية للحشرات المتواجدة على نبات الديرس (*Ampelodesma mauritanicum*) في منطقة تلمسان (الجزائر). أمينة دمرجي، قسم البيولوجيا، كلية العلوم، جامعة أبي بكر بلقايد، ص.ب. 119، تلمسان، الجزائر، البريد الإلكتروني: damerdji_halim@yahoo.fr

نتج عن تدهور الغابات في منطقة تلمسان في الشمال الغربي للجزائر ظهور مناطق التحطيم الغابي وزيادة النباتات الجافة مثل الديرس والدوم. وتعد *Ampelodesma mauritanicum* مقاومة للجفاف بأشكالها المظهرية وخصائصها البنوية. تهدف هذه الدراسة إلى جرد مجاميع الحشرات ذات الصلة، حيث تمت عملية التقصي ببلدية منصورية في المحطات الثلاثة موضع الدراسة من شهر تموز/يوليو 2000 إلى شهر أذار/مارس 2001. وقدرت الأنواع المتواجدة بحوالي 112 من بينها 88 نوعاً من الحشرات، وهي تضم 85 نوعاً من الحشرات المجنحة و3 غير مجنحة. فما يخص الحشرات ذات الأجنحة، انتمى 22 نوعاً إلى Coleoptera، 16 نوعاً إلى Orthoptera، 14 نوعاً إلى Hymenoptera، 13 نوعاً إلى Lepidoptera، 11 نوعاً إلى Hemiptera، 6 أنواع إلى Diptera، نوعان إلى Dermaptera، ونوع واحد فقط إلى Neuroptera. وتم مقارنة نتائج المسح بين المحطات الثلاثة لمختلف أنظمة الحشرات خلال مدة الدراسة. واستعملت الطرائق الإحصائية لمعاملة النتائج المتحصل عليها وبينت المعلومات المتعلقة بالحشرات الخاصة بالديرس.

E 54

الحشرات القشرية وأعدادها الطبيعية في سهل متيجة، الجزائر. حفيضة سايفي، معهد البيولوجيا، ص.ب. 270، طريق صومعة البليدة، جامعة البليدة، الجزائر، البريد الإلكتروني: hdhh@caramail.com

سمحت لنا البحوث التي أجريت حول الحشرات القشرية بسهل متيجة "أكبر سهل في الجزائر"، إلى التعرف على 50 نوعاً على 300 عائلاً نباتياً، موزعة على أربع عوائل (Aspidiotinae، Diaspidinae، Leucaspidae و Odonaspidae). احتلت عائلة Aspidiotinae المرتبة الأولى من حيث النوع (42%)، تلتها عائلة Diaspidinae بـ 30% وعائلة Leucaspidae بـ 22%، أما عائلة Odonaspidae فاحتلت المرتبة الأخيرة بنسبة 2%. تضمنت الدراسة تسجيل نوعين جديدين لأول مرة في الجزائر وشمال إفريقيا والبحر الأبيض المتوسط، وهما: *Clavaspis herculeana* على العوائل Asteraceae، Euphorbiaceae و Fabaceae، و *Parlatoreopsis chinensis* على *Ficus retusa*. أظهر حصر الأعداء الطبيعية وجود طفيليات غشائيات الأجنحة Aphelinidae، وحشرات مفترسة، من بين هذه الحشرات المفترسة، عائلة Coccinellidae سجلت بنسبة عالية.

المتوقعة والمسجلة في الشاهد بمعدل 2.8 و 8.1 مرة عند الجرعة القاتلة لـ 50% من الحشرات، وبمعدل 3.4 و 3.8 مرة عند الجرعة القاتلة لـ 90% من الحشرات. إن هذه النسبة (2 من 14) من المناعة أقل من نسبة 23.4% التي توصلت إليها منظمة الأغذية و الزراعة (FAO) خلال الدراسة التي أجرتها حول هذا الموضوع على مستوى العالم في عام 1972. وتعتبر هذه النسبة، مع ذلك، ملفتة للنظر. وقد يعود السبب في ظهور هذا المستوى من المناعة إلى انحراف في مستويات فوسفيد الهيدروجين المعطى أثناء التعقيم عن المستويات المطلوبة نتيجة لعدم التغطية المحكمة.

E 49

الوفرة العددية الموسمية لحشرات من النجيليات وحشرات أبو العيد ذو الإحدى عشر نقطة على أربعة محاصيل حبوب في مصر. فرغل أحمد علي سلمان ومجدي عبد العظيم أحمد، معهد بحوث وقاية النباتات، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: dr_homam@hotmail.com

أجريت التجارب بمحطة البحوث الزراعية بشندويل في محافظة سوهاج، مصر على محصولي القمح والشعير خلال الموسمين الزراعيين 2004/2003 و 2005/2004، وعلى محصولي الذرة الرفيعة والذرة الشامية خلال الموسم 2004/2003. أظهرت النتائج أن نباتات القمح تصاب بأربعة أنواع من المن وهي حسب توأجدها: من الشوفان (*Rhopalosiphum padi* (L.))، المن الأخضر (*Schizaphis graminum* (Rond.))، من أوراق الذرة (*Rhopalosiphum maidis* (Fitch))، من الغلال الإنجليزي (*Sitobion avenae* (Fab.)). يظهر من الشوفان مبكراً عن بقية الأنواع، وبلغت أقصى ذروة لتعداد المن عامة في الأسبوع الرابع من آذار/مارس خلال موسمي الدراسة متزامناً مع أقصى تعداد لحشرة أبو العيد خلال الموسمين، أما على الشعير فقد وجد أن من أوراق الذرة الشامية هو المن السائد خلال الموسمين وذلك في الفترة من بداية ونهاية شهر شباط/فبراير حتى الأسبوع الأول من شهر آذار/مارس خلال الموسمين متزامناً مع أقصى تعداد لحشرة أبو العيد. ووجد أن محصول الذرة الرفيعة تصاب بنوعين من المن هي حسب سيادته من أوراق الذرة والمن الأخضر، حيث ظهر من أوراق الذرة خلال الأسبوع الأول والثاني والثالث من تموز/يوليو خلال الموسمين 2004/2003 و 2005/2004، وبلغت أقصى ذروة لحشرة المن الأخضر خلال الأسبوع الأول من آب/أغسطس والأسبوع الأول من أيلول/سبتمبر خلال الموسمين 2004/2003 و 2005/2004، على التوالي. في حين أن أقصى ذروة لتعداد حشرة من أوراق الذرة كانت خلال الأسبوع الأخير من آب/أغسطس خلال الموسمين متزامناً مع أعلى تعداد لحشرة أبو العيد. ووجد أن الذرة الشامية تصاب فقط بمن أوراق الذرة وتبدأ الإصابة بهذا النوع خلال الأسبوع الأول من آب/أغسطس في كلا الموسمين. في حين أن أقصى ذروة للتعداد خلال الأسبوع الأول من أيلول/سبتمبر خلال الموسمين وهذا متزامناً مع أعلى تعداد لحشرة أبو العيد.

E 50

حصر أولي للأفات الحشرية والأكاروسية على البندورة /الطماطم في الزراعات المحمية في الساحل السوري. محمد أحمد، قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية.

أجريت دراسة خلال موسمي 2005/2004 و 2006/2005 تم خلالها حصر الأفات الحشرية والأكاروسية التي تغزو البندورة المحمية/الطماطم في المنطقة الساحلية من سورية بدءاً من مستوى سطح البحر وحتى 1100 م. دلت النتائج على وجود الأفات التالية: *Bemisia tabaci* (Homoptera: Aleyrodidae)، *Trialeurodes vaporariorum* (Homoptera: Aleyrodidae)، *Liriomyza* sp. (Diptera: Agromyzidae)، *Plusia gamma* (Diptera: Agromyzidae)، *Spodoptera littoralis* (Diptera: Agromyzidae)، *Agrotis* sp. (Lepidoptera: Noctuidae)، *Chrysodeixis chalcites* (Lepidoptera: Noctuidae)، *Agrotis* sp. (Coleoptera: Elateridae)، *Tetranychus* (Acari: Tetranychidae)، *urticae* (Acari: Tetranychidae)، *Aculops lycopersici* (Acari: Eriophidae)، *Aphis gossypii* (Homoptera: Aphidae)، *Thrips tabaci* (Homoptera: Thripidae)، *Thrips tabaci* (Thysanoptera: Thripidae). كما تم تحديد مواعيد الظهور وتغيرات الكثافة السكانية لبعض هذه الأفات في بعض المواقع.

E 51

تقدير ضرر الديدان السلوكية *Agrotis* spp. على محصول البطاطا/البطاطس في وسط العراق. رضا صكب الجوراني¹ وعزي هبة الله شريم². (1) كلية الزراعة، جامعة بغداد، العراق، البريد الإلكتروني: redha-aljorany@yahoo.com؛ (2) اليمن، البريد الإلكتروني: shoriam74@yahoo.com

نفذت الدراسة في ثلاثة حقول في منطقة الرضوانية، بغداد، العراق لموسم زراعة البطاطا/البطاطس الخريفي عام 2003 والموسم الربيعي 2004 لتقدير الضرر الذي تسببه يرقات الديدان السلوكية *Agrotis* spp. لدرنات محصول البطاطا/البطاطس *Solanum tubersum* الصنف Desiree. أظهرت الدراسة أن نسبة الإصابة والضرر تكون في الزراعة الربيعية أعلى منها في الزراعة الخريفية إذ بلغت نسبة الدرنات المتضررة (Damage) 37% كنسبة من العدد الكلي للدرنات

E 46

دراسة تأثير درجة الحرارة في بعض جوانب حياتية خنفساء اللوبياء الجنوبية (*Callosobruchus maculatus* (F.)) خديجة سليمان محمد¹ وطارق محمد صالح². (1) قسم علوم الحياة، كلية الآداب والعلوم، هون، جامعة التحدي، ليبيا، البريد الإلكتروني: khdiyas@yahoo.com؛ (2) قسم علم الحيوان، كلية العلوم، جامعة 7 أكتوبر، مصراتة، ليبيا.

أجريت دراسة على بعض جوانب حياتية خنفساء اللوبياء الجنوبية *Callosobruchus maculatus* (Coleoptera:Bruchidae) مخبرياً عند أربعة درجات حرارة مختلفة (20، 25، 30 و 35 °س) ورطوبة نسبية ثابتة (60%) على بذور اللوبياء. أظهرت النتائج أن لدرجات الحرارة المختبرة تأثير ملحوظ في حياتية خنفساء اللوبياء الجنوبية، حيث اختلفت الفترة اللازمة لكل طور باختلاف درجة الحرارة. وأظهر التحليل الإحصائي أن الفروقات في دورة الحياة كانت معنوية عند جميع درجات الحرارة المستخدمة ما عدا الفترة بين درجتى حرارة 30 و 35 °س. وبلغت تلك الفترات 62.80، 30.5، 21.34 و 21.23 يوماً عند درجات الحرارة 20، 25، 30 و 35 °س، على التوالي. وكانت النسبة المئوية لفقس البيوض 59، 97، 51 و 80% عند درجات الحرارة السابقة، على التوالي. كما كان لدرجات الحرارة تأثيراً معنوياً واضحاً في فترة عمر البالغات، حيث بلغ متوسط عمر الذكور 14.4، 10.3، 7.2 و 3.5 يوماً، وعمر الإناث 12.7، 8.0، 6.0 و 4.2 يوماً عند درجات الحرارة السابقة، على التوالي.

E 47

أثر التعطيش على الكثافة العددية لبعض الآفات من مفصليات الأرجل والمفترسات المصاحبة لها على أصناف مختارة من اللوبياء. فاروق عبد القوى عبدالجليل¹، محمد عبد الرحمن محمد عمرو² وعبد اللاه سيد حسين عبد المنعم³. (1) قسم وقاية النبات، كلية الزراعة، جامعة أسبوط، مصر؛ (2) معهد بحوث وقاية النبات، وزارة الزراعة، مصر؛ (3) المركز القومي للبحوث، الدقي، القاهرة، مصر، البريد الإلكتروني: abdellah65@yahoo.com

أجريت دراسات حقلية لتقييم أثر التعطيش في وجود بعض الآفات من مفصليات الأرجل والمفترسات المصاحبة لها على خمسة أصناف جديدة من اللوبياء (TVu21 improved، Monarch black eye، Kaha 1، Dokki 331) عند الري بالمعدل التقليدي كل 10 أيام، وعند التعطيش بالري كل 20 يوماً. أظهرت النتائج أن الذباب الأبيض (*Bemisia tabaci* Genn.) وأكاروس العنكبوت الأحمر (*Tetranychus urticae* Koch.) وجدت بأعداد أعلى على النباتات التي تم تعطيشها مقارنة بتلك التي تم ريهها بالمعدلات العادية. وقد تعزى تلك النتيجة إلى قيام النبات عند تعطيشه بتخزين مواد غذائية في أوراقه خلال فترة التعطيش. من جهة أخرى فإن المفترسات المصاحبة لتلك الآفات لم تتأثر أعدادها باختلاف معدلات الري. أما بالنسبة للإصابة (التعداد والضرر) التي تسببها دودة قرون اللوبياء (*Etiella zinckenella* Treitschke) فقد كانت معدلاتها أعلى على الأصناف التي تم تعطيشها مقارنة بتلك التي تم ريهها بالمعدلات العادية. وقد تعزى تلك النتيجة إلى تراكم الأحماض الأمينية الحرة في بذور اللوبياء التي تم تعطيشها والتي قد تصبح أكثر ملائمة لتغذية يرقات تلك الآفة. كما أظهرت النتائج أنه عند الحصاد كان المحصول أوفر في حالة الزراعات المروية رياً عادياً من تلك التي تم تعطيشها. لذلك ينصح بري اللوبياء بالمعدلات المطلوبة على الأقل مرة كل 10 أيام لتجنب الإصابة العالية بالآفات الثاقبة الماصة وكذلك بدودة قرون اللوبياء، وفي نفس الوقت لتتمكن من الحصول على عائد محصولي ووفير وجيد.

E 48

ظاهرة المناعة ضد غاز الفوسفين عند سلالات من ثاقبة الحبوب الصفراء (*Rhizopertha dominica* (Fabricius)) تصيب عينات من حبوب القمح والشعير جمعت من 10 منشآت لتخزين الحبوب في شمال السورية. عبد العزيز نيان¹، سربيل كورنوشور²، طوني فان جاستل¹ وزاودي بيشاوا¹. (1) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب.5466، حلب، سورية؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة شوكروروا، أضنة، تركيا، البريد الإلكتروني: a.niane@cgiar.org

لتقدير مدى وجود وانتشار ظاهرة المناعة إزاء غاز الفوسفين في سورية والأسباب المحتملة لذلك، تم جمع 14 عينة مصابة بثاقبة الحبوب الصفراء (*Rhizopertha dominica* (Fabricius)) من 10 منشآت لتخزين الحبوب في شمال سورية. استخلصت من كل عينة مجموعة من الحشرات سميت 'سلالة' واعتبرت ممثلة للعينة التي أخذت منها. تم تعريض الحشرات إلى تراكيز مختلفة من فوسفيد الهيدروجين بما فيها الجرعة القاضية التي من المفترض أن تصل نسبة موت الحشرات عندها إلى 100% وهي 0.03 مغ/ليترهواء لفترة 20 ساعة في درجة حرارة 25 °س وتحت رطوبة نسبية (75%). أظهرت سلالتان من السلالات 14 في نهاية التجربة مستوى عال من المناعة، وكانت نسبة موت الحشرات في السلالتين أقل من النسبة

منطقة تل حديا تهاجم هذه الآفة هي: (Hymenoptera: Braconidae) *Bracon* sp.، (Hymenoptera: Eurytomidae) *Eurytoma* sp. و (Hymenoptera: Pteromalidae) *Cyrtotypx* sp.

E 44

دراسة تغير أعداد من الفول الأسود (*Aphis fabae*) على نبات الفول وحصر أعدائه الحيوية في ريف دمشق. لؤلؤ البيطار¹، نبيل أبو كف² وزياد شيخ خميس³. (1) إدارة بحوث وقاية النبات، الهيئة العامة للبحوث العلمية الزراعية، دوما، ص.ب. 113، دمشق، سورية، البريد الإلكتروني: louloual@maktoob.com؛ (2) قسم وقاية النبات، كلية الزراعة، جامعة تشرين، اللاذقية، سورية؛ (3) قسم وقاية النبات، كلية الزراعة، جامعة البعث، حمص، سورية.

أجريت دراسة حقلية في الموسم الزراعي 2005/2004 في منطقة ريف دمشق (سورية) لدراسة تغير أعداد من الفول الأسود *Aphis fabae* على نبات الفول وفقاً لتغير الظروف الجوية ووجود الأعداء الطبيعية (خنافس أبو العيد وذباب السيرفيد) لهذه الحشرة. كان تصميم التجربة من نوع القطاعات العشوائية، اختير منها في كل قراء 30 نبات عشوائياً لعد حشرات المن (مجنحة وغير مجنحة) والأعداء الطبيعية الموجودة عليها، تم حساب النسبة المئوية للإصابة وشدتها وفقاً لسلم Geibler. سجل أول ظهور لأفراد المن (2 فرد مجنح) في تاريخ 2005/3/12 وقد بلغت النسبة المئوية للإصابة عندها 3.33% ثم تزايدت بعد ذلك النسبة وتزايدت معها الشدة لتصل إلى ذروتها 100% بتاريخ 2005/5/9، وقد تراق ذلك مع وصول أعداد المن إلى الذروة. كما تم تسجيل ظهور الأعداء الطبيعية والتي كانت بأعداد قليلة مع بداية تشكل مستعمرات المن، وأخذت هذه الأعداد بالتزايد فيما بعد لكن ببطء لتصل إلى الذروة في منتصف نيسان/أبريل بالنسبة للخنافس، وفي نهاية الثلث الأول من أيار/مايو لذباب السيرفيد. سجلت أنواع الخنافس الموجودة فكانت خمسة: أبو العيد ذو السبع نقاط *Coccinella septempunctata*، ذو أحد عشرة نقطة *C. undecimpunctata*، ذو العشر نقاط *Adalia decimpunctata*، ذو أربع عشرة نقطة *Propylaea quaterdecimpunctata*، أبو العيد ذو النقطتين *C. bipunctata*، بالإضافة إلى نوعين لم يتم تصنيفهم. وقد كانت الغالبية العظمى لنوع الأحد عشرة نقطة. وأظهرت نتائج حساب معامل الارتباط وجود ارتباط ضعيف وغير معنوي ($r = 0.476$) ما بين أعداد المن (مجنحة وغير مجنحة) ودرجات الحرارة وبوجود خنافس أبو العيد، بينما كان ارتباطها بذباب السيرفيد متوسط ومعنوي ($r = 0.68$). وكان الارتباط شديداً ومعنوياً مع النسبة المئوية للإصابة ($r = 0.941$)، بالمقابل كان ارتباط الأعداء الطبيعية (خنافس أبو العيد وذباب السيرفيد) شديد ومعنوي مع درجات الحرارة ($r = 0.73$).

E 45

تقدير درجة مقاومة أنواع تجريبية من فول الصويا لدودة قرون اللوبياء *Etiella zinckenella* Treitschke والذبابة البيضاء *Bemisia tabaci* Gennadius في الواحات الداخلة بمحافظة الوادي الجديد، مصر. محمد عبد الرحمن عمرو¹، محمود سيد عمر¹، عبد الله سيد حسين عبد المنعم². (1) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، الدقي، الجيزة، مصر؛ (2) قسم الآفات ووقاية المزروعات، المركز القومي للبحوث، الدقي، الجيزة، مصر، البريد الإلكتروني: a7med_3mr@yahoo.com

أجريت الدراسة بزراعة ثلاث أصناف وسلالتين من فول الصويا في منطقة منعزلة شبه صحراوية بالواحات الداخلة بمحافظة الوادي الجديد. وقد تم تقدير درجات مقاومة هذه الأصناف والسلالات للإصابة بدودة قرون اللوبياء (*Etiella zinckenella*) والذبابة البيضاء (*Bemisia tabaci*). أظهرت النتائج أن النسبة المئوية لإصابة قرون فول الصويا بدودة قرون اللوبياء كانت 4.30، 3.54 و 9.13% للأصناف كلارك، جيزة 22 وتونو، على التوالي. بينما كانت النسبة المئوية لإصابة سلالات فول الصويا هجين 32 وسلالة 5 هي 2.38 و 3.21%، على التوالي. وقد بدت نتائج تقدير النسبة المئوية للضرر الذي تحدثه يرقات هذه الآفة للبيذور الخضراء والجافة مماثلة للنتائج السابقة. فقد سجلت أعلى نسبة للضرر علي بذور الصنف تونو بمقدار 9.30% بينما سجلت أقل نسبة للضرر علي السلالة هجين 32 بمقدار 1.97%. كما دلت النتائج علي وجود توافق كبير بين درجة مقاومة أصناف وسلالات فول الصويا المختبرة لدودة قرون اللوبياء وبين أعداد يرقات تلك الآفة التي تهاجم القرون النامية. ولذلك فقد بدت كلا من سلالتين من فول الصويا هجين 32 و 5 كسلالتين متوسطي المقاومة للآفة بينما بدت الأصناف كلارك وجيزة 22 وتونو كأصناف أقل مقاومة، وقابلة للإصابة وعالية القابلية للإصابة، على التوالي. وباعتبار أن متوسط أعداد حوريات الذبابة البيضاء التي تهاجم أوراق فول الصويا تعبر عن حالة مقاومة النبات للآفة فقد أظهرت النتائج توافق كبير بين متوسط أعداد الحوريات علي الأوراق ودرجة قابلية الأصناف المختبرة للإصابة بالآفة. وبالرغم من ظهور درجات مختلفة من القابلية للإصابة بالآفة بين الأصناف والسلالات المختبرة إلا أن السلالة "س 5" ظهرت كسلالة مقاومة للذبابة البيضاء. وبناءً على ذلك فيمكن توجيه مربي النباتات إلى اختيار السلالات والأصناف التي تحمل مستويات مرغوبة من المقاومة لكل من دودة قرون اللوبياء والذبابة البيضاء في برامج التربية مع عمل محاولات جادة لنقل المورثات المسئولة عن هذه الخصائص للأصناف المنتجة حديثاً.

حرارة 14، 22 و 28 °س، على التوالي، واستغرق تطور البيض 16.3، 5.4 و 3.6 يوماً، وتطور اليرقات 20.3، 8.4 و 7 أيام، أما لدى العذارى فقد بلغت مدة التطور 29.1، 12.7 و 8.2 يوماً عند درجات الحرارة المذكورة أعلاه، على التوالي. بلغ الحد الحرج لتطور مختلف أطوار الحشرة 10.6°س للبيض، 7.1°س لليرقات و 10°س للعذارى. عند دراسة تأثير المضيف النباتي على في تطور الحشرة عند درجتي الحرارة 14 و 28°س، كانت مدة تطور الحشرة على الفول أقصر من مدة تطورها على الخيار وبدرجة معنوية. وكانت 48 و 16 يوماً عند درجتي الحرارة 14 و 28°س على الفول، بينما وصلت إلى 66 و 18 يوماً على الخيار عند درجتي الحرارة السابقة، على التوالي. درس تفضيل الحشرة للمضيفين النباتيين الخيار والفول، وتبين أنها تفضل الفول على الخيار. فقد كان متوسط عدد ثقب التغذية ووضع البيض على الخيار 49.7 ارتفع إلى 386.9 على الفول، أما متوسط عدد العذارى فقد بلغ 10.8 على الخيار ووصل إلى 251 على الفول.

E 42

فقد الغلة الذي تسببه حافرة أنفاق أوراق الحمص *Liriomyza cicerina* Rond. سها خوجه¹، مصطفى البوحسيني²، نوال كعكة³ و عبد الله جوي². (1) الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية بحلب، حلب، سورية؛ (2) المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: M.bohssini@cgiar.org؛ (3) كلية الزراعة، قسم وقاية النبات، جامعة حلب، حلب، سورية.

تعتبر حشرة حافرة أنفاق أوراق الحمص *Liriomyza cicerina* Rond. آفة حشرية مهمة على محصول الحمص في شمال أفريقيا وغرب و آسيا. أجريت الدراسة الحالية في تل حديا، محطة تجارب إيكاردا، لتقدير خسائر الغلة الذي تسببه هذه الحشرة. استخدم في هذه الدراسة صنفان مقاومان (ILC3800 و ILC5901)، صنف حساس (ILC3397) والصنف المحلي (ILC1929). أجريت التجربة باستخدام تصميم القطاعات العشوائية الكاملة وبأربعة مكررات خلال موسم الزراعة 2002/2001 و 2003/2002. في موسم 2002/2001 كانت أقل نسبة إصابة على الأوراق في الطور الخضري 9.1% عند الصنف المقاوم ILC5901 مقارنة مع الشاهد الحساس (23.7%). وفي الطور الثمري حصل الصنف المقاوم ILC3800 على أقل نسبة إصابة على الأوراق (10.3%)، بالمقارنة مع الصنف الحساس (79.8%). وكانت نسبة فقد الغلة في الصنفين المقاومين أخفض معنويًا بالمقارنة مع الصنف الحساس حيث بلغ فقد الغلة على التوالي 11.8، 13.9 و 33.3% للأصناف ILC3800، ILC5901 و ILC3397، على التوالي. في موسم 2003/2002 كانت النتائج مشابهة لنتائج 2002. أثبتت نتائج هذه الدراسة أن حافرة أنفاق أوراق الحمص آفة مهمة على الحمص. كما أظهرت أيضاً أن نشر أصناف الحمص المقاومة لحافرة الأنفاق سيسهم بشكل كبير في تخفيض الضرر الذي تسببه هذه الآفة.

E 43

تأثير موعد الزراعة، المبيدات الحشرية في نسبة الإصابة بدودة قرون البقوليات (*Etiella zinckenella* T.) على نبات فول الصويا وحصر الطفيليات التي تهاجم هذه الآفة. خالد مارديني، حسني أبو خالد وسها خوجه، الهيئة العامة للبحوث العلمية الزراعية، مركز البحوث العلمية الزراعية بحلب، حلب، سورية، البريد الإلكتروني: Kmardini@hotmail.com

تهاجم يرقات دودة قرون البقوليات (*Etiella zinckenella* T.) (Lepidoptera: Pyralidae) نبات فول الصويا وتسبب خسائر في الغلة خاصة على العروة التكاثيفية. تم في هذا البحث دراسة تأثير موعد الزراعة للعروة التكاثيفية والمكافحة بالمبيدات الحشرية في نسبة الإصابة بهذه الآفة. بلغت نسبة الإصابة في السنة الأولى في موعد الزراعة الأول للعروة الربيعية (20 حزيران/يونيو) 9.2%، و 13.5% في الموعد الثاني (5 تموز/يوليو)، و 15.8% في الموعد الثالث (20 تموز/يوليو). وقد انخفضت نسبة الإصابة في الموعد الأول إلى 4.85% عند مكافحة هذه الآفة بمبيد الدلتا مثرين، في حين بلغت 6.47% عند مكافحة بمبيد ميثيل الباراثيون. وبينت النتائج أيضاً أن نسبة الإصابة في السنة الثانية في موعد الزراعة الأول للعروة الربيعية بلغت 9.5%، في حين بلغت 22.4% في الموعد الثاني و 46.8% في الموعد الثالث. وانخفضت نسبة الإصابة في الموعد الأول إلى 8.6% عند مكافحة هذه الآفة بمبيد الدلتا مثرين، وبلغت 10.4% عند مكافحة بمبيد ميثيل الباراثيون. وبلغ متوسط الغلة في موعد الزراعة المبكرة للعروة الربيعية في السنة الأولى (2000) 2484 كغ/هـ، في حين بلغ 2048 كغ/هـ في الموعد الملائم و 1086 كغ/هـ في الموعد المتأخر. وقد ارتفع متوسط الغلة في الموعد الأول إلى 2549 كغ/هـ عند مكافحة هذه الآفة بمبيد الدلتا مثرين، وكان متوسط الغلة 2488 كغ/هـ عند مكافحة بمبيد ميثيل الباراثيون. بلغ متوسط الغلة في موعد الزراعة الأول للعروة الربيعية في السنة الثانية (2001) 2146 كغ/هـ، و 1759 كغ/هـ في الموعد الثاني و 694 كغ/هـ في الموعد الثالث. وقد ارتفع متوسط الغلة في الموعد الأول إلى 1960 كغ/هـ عند مكافحة هذه الآفة بمبيد الدلتا مثرين، وكان متوسط الغلة 3396 كغ/هـ عند مكافحة بمبيد ميثيل الباراثيون. وقد تم تسجيل 3 أجناس من الطفيليات في

الوقت اللازم لنمو وتطور الأطوار المختلفة يتناسب سلباً مع درجة الحرارة من 20 إلى 30° س، إذ بلغ النمو البيولوجي 0 عند درجات الحرارة 13.15، 9.64، 11.07 و 9.64 و 10.67° س لكل من البيض، اليرقات، العذارى، مرحلة ما قبل العذراء والجيل الكامل، على التوالي. وبلغ عدد الوحدات الحرارية اللازمة لإتمام النمو والتطور 36.0، 196.1، 111.29، 29.06 و 368.3 وحدة حرارية يومية، لكل من الأطوار السابقة، على التوالي.

E 39

تأثير بعض أسمدة التربة والأملاح غير العضوية ضد طوري اليرقة والعذراء لدودة ورق القطن *Spodoptera littoralis* (Boisd.). سندس عبد التواب محمد¹، حسن فرج ضاحي¹ وأحمد غازي السيسي². (1) معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: hassandahi@yahoo.com؛ (2) المختبر المركزي للمبيدات، مركز البحوث الزراعية، الدقي، الجيزة، مصر.

تم تنفيذ تجربتين لتقييم سمية الأسمدة الأرضية (سلفات النشادر، سلفات البوتاسيوم والسوبر فوسفات) واثنين من الأملاح غير عضوية (أوكسالات الأمونيوم وبرومات البوتاسيوم) ضد طور اليرقة الذي يصيب النمو الخضري وطور العذراء الموجود بالتربة لدودة ورق القطن. دلت نتائج تخفيف المواد ورشها لمكافحة اليرقات بتركيزات 2، 1 و 0.5% على نباتات القطن، على أن كل المواد أعطت تأثيراً ابتدائياً منخفضاً لكنها أظهرت تأثيراً سلبياً متأخراً، إذ أن الموت في الطور اليرقي تناسب طردياً مع المدة بعد المعاملة مع استمرار التغذية على الورق المعامل. أظهرت برومات البوتاسيوم أعلى تأثير يليها أوكسالات الأمونيوم والسوبر فوسفات حيث أعطت أعلى نسبة موت لليرقات وأقل نسبة في خروج العذارى. ومن ناحية أخرى دلت النتائج المتحصل عليها على أن سماد السوبر فوسفات كان الأعلى في درجة السمية ضد طور العذراء (63.3%) يليه برومات البوتاسيوم (56.1%) ثم سلفات البوتاسيوم وأوكسالات الأمونيوم، بينما أعطت سلفات النشادر أقل تأثير. علاوة على ذلك فقد تم تسجيل العدد الكلي للبيض ونسبة الفقس الناتجة من تزاوج الفراشات لكل معاملة. ودلت النتائج على أن كل المعاملات قللت عدد البيض ونسبة الفقس. وكانت برومات البوتاسيوم هي الأفضل في تقليل عدد البيض يليها السوبر فوسفات وسلفات البوتاسيوم مقارنة بغير معاملة. ومما سبق يمكن الاستدلال على فاعلية المواد المختبرة ضد دودة ورق القطن كبداية للمبيدات، بالإضافة لدورها الأساسي كعناصر غذائية لنباتات القطن.

E 40

ظهور وتواجد والضرر الذي تسببه دودة اللوز الأفريقية (*Helicoverpa amigera* Hub.) في الحقل في مشروع الجزيرة والرهد. الناير حامد سليمان، مركز بحوث وقاية المحاصيل، هيئة البحوث الزراعية، السودان، البريد الإلكتروني: elnayer15@yahoo.com

ظهرت الحشرة في الحقل لأول مرة في الرهد والجزيرة في اليوم 15 و 19، على التوالي وذلك خلال شهر آب/أغسطس عام 1997 على بعض الحشائش مثل القبر (*Ipomea cordofana*) وإبريق الفكي (*Commliena kostichyi*)، كما ظهرت على الفول السوداني (*Arachis hypogea*). بدأت الإصابة في الأصناف المختبرة عندما وصل الذرة إلى مرحلة الأزهار وكان ذلك في اليوم 12 و 13 من شهر أيلول/سبتمبر من عام 1997 في مزرعة محطتي بحوث الجزيرة والرهد، على التوالي. أثبتت الدراسة أن نبات الذرة تعرض للإصابة بواسطة جيلين من الحشرة خلال موسم 1997/1998 وتساوت فترة الجيل الأول والثاني في الرهد والجزيرة حيث بلغت 28 يوماً، واختفت يرقات الجيل الأول من الحقل في 10 و 11 تشرين الأول/أكتوبر، 1997 في الجزيرة والرهد، على التوالي. بينما اختفت يرقات الجيل الثاني من الموقعين على التوالي في 13 و 18 تشرين الثاني/نوفمبر 1997. كانت أعلى كثافة عددية سجلت للحشرة في الجيل الأول خلال شهر أيلول/سبتمبر، وبلغ متوسط عدد اليرقات والبيض في 19 و 27 أيلول/سبتمبر 1997 متوسط 5.68 و 6.45 يرقة أو بيضة/100 نبات في الرهد والجزيرة، على التوالي، بينما ارتفعت كثافة الحشرة في الجيل الثاني خلال شهر تشرين الأول/أكتوبر، وبلغت 13.3 و 6.6 يرقة أو بيضة/100 نبات في الجزيرة والرهد، على التوالي.

E 41

دراسة حياتية لحافرة أنفاق البازلاء *Liriomyza huidobrensis* Blanchard. رسمية المعلم، الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 113، دوما، دمشق، سورية، البريد الإلكتروني: arasmia@scs-net.org

تعد حافرة أنفاق البازلاء *Liriomyza huidobrensis* (Diptera: Agromyzidae) النوع الأكثر انتشاراً من حافرات الأنفاق في البيوت المحمية وفي الحقل المفتوح في سورية. تهاجم هذه الآفة العديد من أنواع الخضار والمحاصيل ونباتات الزينة مسببة أضراراً كبيرة وخاصة في الزراعات المحمية. درست دورة حياة الحشرة والتطور عند درجات حرارة ثابتة على نبات الخيار *Cucumis sativus* L. var. Toshka، وقد بلغت مدة التطور الإجمالية 65.6، 26.6 و 18.1 يوماً عند درجات

E 35

حصر لسلاسل الذباب الأبيض (*Bemisia tabaci* (Gennadius) في الأردن باستخدام الحامض النووي المتعدد الأشكال المكبر عشوائياً RAPD. حازم شريف حسن، قسم العلوم الزراعية، كلية الشوبك الجامعية، جامعة البلقاء التطبيقية، الرمز البريدي 19117، السلط، الأردن، البريد الإلكتروني: hazem@bau.edu.jo

تم استخدام تفاعل البوليمراز التسلسلي للحامض النووي المتعدد الأشكال المكبر عشوائياً لحصر سلالة B والسلاسل الأخرى للذباب الأبيض في الأردن. تم جمع الذباب الأبيض من النباتات المزروعة والبرية والأعشاب من 9 مواقع مختلفة ومن 12 نبات بمجموع 123 عينة حشرية. تم إجراء التفاعل الحامض النووي المتعدد الأشكال المكبر عشوائياً باستخدام ثلاثة بادئات بعشرة نيوكليوتيدات لتعريف سلالات الذبابة البيضاء. أظهرت النتائج وجود 29 حمزة للحامض النووي المنقوص الأكسجين. وبين تحليل التجمع انتشار السلالة B بصورة غير معتمدة على الموقع المجموعه منه، أما في نفس الموقع فكان ظهور السلالة B معتمداً على النباتات المزروعة. كما بينت النتائج وجود سلالة وسطية BA وسلالة A. تمتلك بعض العينات في السلالة BA حمزة مميزة في البادئ OPR-04 مماثلة للحمزة التي تمتلكها السلالة A. وفي تحليل "جكار" للتشابه كانت المسافة الجينية أكبر بالمقارنة لسلالة B وكانت هذه العينات مجموعة من النباتات البرية والأعشاب. وكانت السلالة A متركزة في المناطق المعزولة بالمقارنة مع السلالات الأخرى. كانت نسب السلالات A، B و BA، على التوالي 12.5، 75.0، 12.5% في غور الأردن والمناطق المرتفعة في عينات التجربة.

E 36

تأثير التحكم في ذبابة القطن البيضاء (*Bemisia tabaci*) والحشائش/الأعشاب في حقول الخيار على الإصابة بذبابة القطن البيضاء في حقول القطن المجاور. محمد إبراهيم شديد، صلاح الدين حسين وهمام بخيت همام، معهد بحوث وقاية النباتات، شارع نادي الصيد، الدقي، جيزة 12618، مصر، البريد الإلكتروني: dr_homam@hotmail.com

أجريت تجربتان حقليتان في محافظه المنوفية خلال موسمين متتاليين في عامي 2002 و 2003 بهدف خفض تعداد حوريات ذبابة القطن البيضاء باستخدام العزيق اليدوي للحشائش/الأعشاب مرتين في حقول الخيار. واستخدم مبيد الريلدان 50% والاكيتيك أو زيت معدني (كابال-2)، أو زيت نباتي (زيت جو جوبا) أو مستخلص بذور النيم أو استخدام (زيت كابال-2 + الكبريت الميكروني). أوضحت النتائج المتحصل عليها أن عزيق الحشائش/الأعشاب والرش بمبيد الاكيتيك أو الزيت المعدني (كابال-2) + الكبريت الميكروني أعطت تأثيراً معنوياً في خفض غزو ذبابة القطن البيضاء في حقول القطن. ويعتبر هذا العمل محاولة لاستبدال المركبات الكيميائية قوية السمية بأخرى أقل تأثيراً في التلوث البيئي. كما أن استخدام المكافحة الميكانيكية (العزيق اليدوي) للحشائش مع زيت المعدني (كابال-2) + الكبريت الميكروني أعطى نتائج واعدة.

E 37

التأثير المباشر وغير المباشر لدودة الجوز الشوكية في عشرة أصناف من القطن. سعاد أرديني عيد الله، قسم وقاية النبات، كلية الزراعة والغابات، جامعة الموصل، الموصل، العراق، البريد الإلكتروني: suaad53irdeny@yahoo.com

تركزت نتائج التأثير المباشر وغير المباشر لدودة الجوز الشوكية في عشرة أصناف من القطن (س ب 8886، عاشور، مونتانا، دن 1517، دن 325، دن 1047، استونفيل 887، دلتا باين 50، لاشاتا، وكوكر 310) لجوز القطن المتكون بعد الجنية الأولى. تفضل اليرقات الجوز الذي تراوح حجمه بين 10-15 سم³، تلاه الجوز بحجم 16-20 سم³. وظهر أكبر عدد للتقوب في الأسبوع الثاني من شهر تشرين الأول/أكتوبر بمتوسط بلغ 273 تقب موزعة 16، 54 و 203 تقب في كل من المستوى العلوي، الوسطي والسفلي، على التوالي. كذلك ارتفع عدد كل من اليرقات الحية والمسكنة الناتجة بسبب الإصابة بنفس الفترة أنفة الذكر بمعدل بلغ 70 يرقة، 240 مسكن، على التوالي. ومن جهة أخرى، ارتفعت النسبة المئوية للبيوض الناتجة لتصل أقصاها 28% في صنف استونفيل 887، واقترن هذا الارتفاع بزيادة النسبة المئوية لكل من فتحات خروج اليرقات والجوز المتعفن بنسبة بلغت 77 و 92%، على التوالي.

E 38

عتبة النمو والاحتياجات الحرارية لدودة ورق القطن الصفري *Spodoptera exigua* Hb. حسن فرج ضاحي وسماح محمود عبد الخالق، معهد بحوث وقاية النباتات، مركز البحوث الزراعية، 7 شارع نادي الصيد، الدقي، الجيزة، مصر، البريد الإلكتروني: hassandahi@yahoo.com

يهدف هذا العمل إلى دراسة تأثير ثلاث درجات حرارة ثابتة داخل منطقة الحرارة الفاعلة (20، 25 و 30°س) في نمو وتطور الأطوار المختلفة لدودة ورق القطن الصفري (*Spodoptera exigua*) (Noctuidae: Lepidoptera). تم تقدير فترة حضانة البيض ومدة طور اليرقة ومدة طور العذراء وفترة ما قبل وضع البيض والجيل الكامل. أوضحت الدراسة أن

E 33

التذبذب العددي لذبابة ثمار القرعيات *Dacus ciliatus* Loew على نبات الكوسة في منطقة الرياض. عبد الرحمن بن سعد الداود، قسم وقاية النبات، كلية علوم الأغذية والزراعة، جامعة الملك سعود، ص.ب. 2460، الرياض 11451، المملكة العربية السعودية، البريد الإلكتروني: aldawood44@hotmail.com

تمت دراسة التذبذب العددي لذبابة ثمار القرعيات (*Diptera: Tephritidae*) *Dacus ciliatus* Loew على صنفين من نبات الكوسة (محلي وهجين) في موقعين متباعدين في منطقة الرياض (حريملاء وديراب) خلال الموسم الزراعي 2003، وذلك بهدف معرفة أنسب وقت لتطبيق طرائق مكافحة الحقلية لهذه الآفة والتي تؤثر في تسويق ثمار الكوسة بسبب ما تحدثه من تشوه للثمار نتيجة وضع البيض وما يتبعه من تعفن للثمار في نهاية الأمر. أظهرت النتائج وجود قمتين لنشاط هذه الآفة، واحدة في بداية شهر أيار/مايو والأخرى في بداية شهر حزيران/يونيو في كلا الموقعين، وتراوحت نسبة الإصابة بين 4-71%. وكان عدد الثمار المصابة ونسبة إصابتها أعلى في حريملاء بالمقارنة مع ديراب، وبلغت 50.2% و 20.3% بالنسبة لعدد الثمار المصابة، بينما بلغت نسبة الإصابة 35.1% و 19.6% في الموقعين، على التوالي. لم تظهر النتائج فروقات معنوية في نسبة الإصابة بين الصنفين. يتضح من هذه النتائج أن زراعة الكوسة في محافظة حريملاء أفضل من ديراب نتيجة لملائمة الظروف البنية في حريملاء والذي إنعكس بزيادة الإنتاج الكلي، وأن زراعة الصنف الهجين أفضل من المحلي أيضاً. ويتضح أن أفضل فترة مقترحة لمكافحة هذه الآفة ولهذه العروة هو قبل بداية شهر أيار/مايو باستخدام الطرائق المناسبة.

E 34

الوضع الراهن لأنواع الذباب الأبيض في اليمن، مع اعتبار خاص لمجموعة النوع (*Bemisia tabaci* (Gennadius)، التي تم جمعها من المناطق المختلفة. عبد الله ناشر مرشد مقبل¹، جون مارتن²، جوديث، ك. براون³. (1) قسم وقاية النبات، كلية الزراعة، جامعة صنعاء، ص.ب. 13609، مكتب بريد معين، صنعاء، اليمن، البريد الإلكتروني: abd_nasher@yahoo.co.in؛ (2) قسم الحشرات، متحف التاريخ الطبيعي، كرومويل رود، لندن، SW7 5BD، بريطانيا، البريد الإلكتروني: j.martin@nhm.ac.uk؛ (3) قسم علوم النبات، جامعة أريزونا، توسان، الولايات المتحدة الأمريكية، البريد الإلكتروني: jbrown@ag.arizona.edu

رغم أن هناك أكثر من 1500 نوع من الذباب الأبيض تم تعريفها على مستوى العالم، إلا أن ثلاثة أنواع فقط هي ماتم رصده في اليمن، حتى الآن وهي: *Bemisia tabaci* (Gennadius)، *Aleurocanthus woglumi* (Ashby) و *Dialeurodes citri* (Ashmead). في هذه الورقة تم التعرف على ثلاثة أنواع أخرى إضافية هي: *Acaudaleyrodes rachipora* (Singh)، *Neomaskellia bergii* (Signoret) و *Singhiella elbaensis* (Priesner & Hosny). بالإضافة إلى ذلك، *B. tabaci* عرفت لفترة طويلة كافة وكنافل للأمراض الفيروسية في اليمن مسببة ضرراً إقتصادياً بسبب تغذيتها، وقدرتها على نقل الفيروسات التوأمية (جنس *Begomovirus*، عائلة *Geminiviridae*). هذا النوع من الفيروسات تصيب العديد من المحاصيل الهامة في اليمن مثل الطماطم/البندورة، بالإضافة إلى الفلفل الحار، والبطيخ، المستخدم في نطاق واسع كمصدر لفيثامين C. لتقييم التنوع الوراثي داخل مجموعة *B. tabaci* المنتشرة في البيئات اليمنية، تم جمع عينات من المناطق الجغرافية المختلفة بما في ذلك، السهول والمرتفعات الجبلية في اليمن، ثم تم إخضاعها للتحليل الوراثي باستخدام ما يعرف بالـ *mitochondria cytochrome oxidase I gene (mtCOI)*. أظهرت نتائج استخدام تقنية البصمة الوراثية، و DNA sequencing، وتحليل التاريخ العرقي للعينات المجموعة، وجود ثلاث سلالات haplotypes على الأقل، متميزة فيما بينها، منها النوع الحيوي B (B biotype) فقط تم الإشارة إلى وجوده في اليمن في دراسة سابقة، بينما السلالتين الأخرين، يبدو أنهما يمثلان النوع المحلي للـ *B. tabaci*. وجدت سلالة متميزة من هاتين السلالتين بشكل خاص في بيئات مناطق المرتفعات الجبلية، بينما الأخرى وجدت سائدة في مناطق الساحل الغربي، ومناطق المرتفعات الجنوبية لليمن، والأخيرة وجدت مختلطة بالنوع الحيوي B. لعل الاختلافات الطبوغرافية، والبيئية الموجودة في اليمن قد لعبت دوراً رئيساً في تشكيل عازل بين ما يعتقد أنهما السلالتين المحليتين. إن وجود كل من النوع الحيوي B، والسلالة المتواجدة في المرتفعات الجنوبية، مختلطة على نفس العوائل النباتية، يدفع للإعتقاد بأن النوع الحيوي B ليس نوعاً محلياً بل جاء من خارج اليمن، بالإضافة إلى أن الإثنتين قد لا يكونان لديهما القدرة على التزاوج فيما بينهما. لذلك هناك حاجة لعمل دراسة مقارنة تشمل القدرة على التزاوج، ومعرفة نوعية الكائنات الدقيقة الموجودة بصورة متكافئة في الجهاز الهضمي لهذه السلالات، بالإضافة إلى قدرتها كناقل للأمراض الفيروسية، وذلك لفهم أفضل للفروق البيولوجية بين النوع الحيوي B، والسلالة المستوطنة المختلطة معه في مناطق المرتفعات الجنوبية، وبين هذه الأخيرة، وبين السلالة المتواجدة في مناطق المرتفعات الجبلية الغربية.

في الأمانة. وتجدر الإشارة أن جميع عينات ثمار البن في كل مواقع الحصر وجدت عليها ثقب تمثل الإصابة الحقلية بخارز البن (فراشة ثمار البن) *Prophantis smaragdina* (Butler) والتي تتبع فصيلة Pyralidae. مع ملاحظة أن الأنواع السابقة الذكر هي التي أمكن تعريفها ولا يزال العمل مستمرا في تعريف الأنواع الأخرى من الحشرات، وكذلك حساب نسبة الإصابة وشدتها سواء منها على الثمار أم الحبوب. إضافة إلى إستمرارية عملية جمع العينات من أماكن تخزينية أخرى في اليمن.

E 30

التنوع الحيوي للفونا الحشرية اليمنية. أحمد محمد أحمد سلام وسعيد عبدالله باعقود، قسم وقاية النبات، كلية ناصر للعلوم الزراعية، جامعة عدن، ص.ب. 2106، الشيخ عثمان، عدن، اليمن، البريد الإلكتروني: amasallam2005@yahoo.com تتميز الجمهورية اليمنية بغطاء نباتي جيد في بعض المناطق مما أكسبها أهمية خاصة في التنوع الحيوي، ونتج عن ذلك تنوعا حيويا في الفونا الحشرية. بلغ عدد أنواع الفونا الحشرية المعروفة حتى الآن في اليمن حوالي 4000 نوعا تتبع 1346 جنسا، 335 عائلة و 27 رتبة، ومن بينها تم مؤخرا توصيف 98 نوعا جديدا إلى العلم، منها 403 نوعا تم تسجيلها لأول مرة في اليمن. ومن المتوقع أن تتضاعف تلك الأعداد خلال السنوات العشر المقبلة. ويتضمن هذا التنوع بداخله العديد من الحشرات الضارة التي بلغ تعدادها 350 نوعا تضر بالمزروعات الحقلية وأشجار الفاكهة والغابات وتهاجم المخازن والمواد المخزونة وكذلك الإنسان والحيوان. كما يحتوي هذا التنوع على العديد من المفترسات والمتطفلات الحشرية التي رصد منها حوالي 180 نوعا، الأمر الذي يستدعي المحافظة عليها واستغلالها. وخلصت الورقة إلى أهم الأسباب التي أدت إلى تحول الأفات الثانوية إلى آفات رئيسية وماهي البدائل غير الكيماوية التي يمكن استخدامها في السيطرة على بعض الآفات الحشرية في الزراعة اليمنية.

E 31

دراسة نظام التوزيع الطبيعي وطريقة أخذ عينات الذبابة البيضاء *Bemisia tabaci* على نباتات الخيار. عبد الغني محمود السيد¹ وجورج كامل عريان² وعبد فوري عبد السلام¹. (1) معهد بحوث وقاية النباتات، الدقي، الجيزة، مصر؛ (2) كلية العلوم والتربية، جامعة عين شمس، مصر، البريد الإلكتروني: dr_homam@hotmail.com.

أمكن دراسة نظام التوزيع الطبيعي وانتشار أطوار حشرة الذبابة البيضاء *Bemisia tabaci* (Aleyrodidae: Homoptera-Hemiptera) على بعض أصناف الخيار في العروتين: الصيفي المبكرة والصيفي المتأخرة خلال موسمي 1999/1998 و 2000/1999. أظهرت النتائج وجود فرق معنوي بين تعداد أطوار الذبابة البيضاء على الأوراق التي تقع على الساق الرئيسي. وكان أكبر تعداد للحشرة الكاملة والبيض ثم اليرقات والعداري على الأوراق التي تقع على الساق الرئيسي من العقدة 4-6، 8-10 و 9-11، على التوالي، للأطوار المختلفة. وبتطبيق قانون التوزيع الطبيعي لـ Taylor's كانت هناك علاقة انحدار للوغاريتم (متوسط العدد + 1) و (التباين + 1). كما وجد أن توزيع أطوار الحشرة تتبع النظام التجمعي ولكن ليس بنفس الوفرة من الكثافة العددية. وتقترح الدراسة أن أفضل تقدير للكثافة العددية تكون بجمع عشرة أوراق من عشرة نباتات من كل مكرر 1/50 فدان من التعداد بطريقة عشوائية على أن يتم أخذ العدد على الورقة 4-6 للحشرة الكاملة ومن 8-10 لطور البيضة ومن الأوراق من 9-11 لليرقات والعداري بحيث يكون الفحص أسبوعيا.

E 32

دراسة تأثير اجهاد الري في كثافة مجتمع ذبابة القطن البيضاء (*Bemisia tabaci*) في منطقة فارامين. سيده م. هاشيمينا، عضو كلية جامعة آزاد الإسلامية، فرع روديهين، إيران، البريد الإلكتروني: angelarmita@yahoo.com تُعد ذبابة القطن البيضاء إحدى أهم الآفات في مناطق واسعة من إيران والعالم مسببة تدهور نوعية القطن. وقد أدى الري في الموعد المناسب وبالكمية الملائمة إلى خفض كثافة مجتمع ذبابة القطن البيضاء، ولتحديد تأثير الإجهاد المائي في كثافة مجتمع الذبابة تم إجراء تجربة في منطقة فارامين عام 2005. صُممت التجربة بطريقة القطاعات المنشقة بثلاث مكررات لكل معاملة ووبريات مختلفة بفاصل زمني 7 أيام أو 14 يوما بمعدل 100% أو 50% من الاحتياج المائي. أظهرت النتائج في فارامين أن تكرار الري كل 7 أيام أدى إلى زيادة في المحصول بمعدل 71.3% مقارنة بتكرار الري كل 14 يوما وخفض مجتمع الذبابة البيضاء (بيض، حوريات، حشرات كاملة)، كما أدى خفض كمية الماء من 100% إلى 50% إلى خفض مجتمع الذبابة البيضاء والمحصول إلى 11%، وكان ناتج الصنف فارامين أكثر من ناتج الصنف ساحل (34.5%).

كطريقة ميكانيكية للتقليل من الكثافة العددية لهذه الآفة، مما يشجع استخدامها في برامج الإدارة المتكاملة لها في بساتين نخيل التمر.

E 27

دراسة مسح ووصف لحفارات سوق أشجار الغابات في منطقة كردستان العراق. بتول عبد الله كرسو وطلال طاهر، قسم الغابات، كلية الزراعة، جامعة دهوك، إقليم كردستان، العراق، البريد الإلكتروني: batool1220@yahoo.com
أظهرت نتائج الدراسات التي أجريت في شمال العراق (إقليم كردستان) إلى وجود العديد من أنواع الحفارات التي تصيب أشجار الغابات والتي وجدت في محافظات دهوك وأربيل والسليمانية. من الناحية التصنيفية تعود الحفارات إلى رتبة غمدية الأجنحة وفصيلة Buprestidae حيث تتميز اليرقة بالرأس المسطح لذلك تعرف ذات الرأس المسطح. وهي تعتبر الطور الضار حيث تسبب أضراراً كبيرة للأشجار المصاب وهي توجد عادة في أنفاق داخل الجنوع والسوق، حيث نفق التغذية يظهر بشكل حرف S تحت القلف. وجد جنس آخر من الحفارات يعود إلى رتبة حرشفية الأجنحة Aegeriidae حيث إن البالغة تكون على شكل فراشة. يقفس البيض وتخرق اليرقات الساق وتحفر أنفاق التغذية تحت اللحاء ويكون النفق على شكل إسطواني وينتج عنها حدوث انتفاخات في السوق كنتيجة للنمو غير الطبيعي بالإضافة إلى تجمع خليط من نشارة الخشب وإفرازات اليرقات. وقد تم وصف مجموعة من بالغات الحفارات التي جمعت من مشاجر القوغ والغابات الطبيعية في إقليم كردستان العراق (ابتداءً من منطقة زاخو الحدودية مع تركيا إلى أقصى الشرق في السليمانية) خلال عمليات المسح التي أجريت في الموسمين 2004 و 2005.

E 28

الآفات الأساسية لأشجار بلوط الفلين *Quercus suber* L. وأثرها في نوعية الفلين في منطقة الغرب الجزائري. بوهراوة رشيد طارق، جامعة تلمسان، كلية العلوم، قسم علوم الغابات، ص ب 119، إمامة 13000 تلمسان، الجزائر، البريد الإلكتروني: rtbouhraoua@yahoo.fr

يعدّ نبات السنديان أو بلوط الفلين من الأشجار المهمة اقتصادياً حيث أن القشرة التي تنتجها والتي تسمى بالفلين تستعمل لأغراض متعددة لا سيما في صناعة السدادات والعوازل. يشهد إنتاج هذه المادة في الجزائر وكذلك في الوطن العربي تدهوراً مستمراً نظراً لتقلص المساحة والحالة الصحية المتدهورة للأشجار. هذا راجع لأسباب متنوعة منها المناخ، غياب المعالجة الحراجية، الحرائق، الأمراض والآفات الحشرية. كشفت الدراسة التي أجريت في بعض غابات السنديان بمنطقة غرب الجزائري عن وجود قائمة تحتوي على حوالي 20 جنساً من الحشرات ذات نمط غذائي خشبي. تنتمي معظم هذه الآفات إلى فصيلة Cerambycidae وكذلك إلى فصائل أخرى، منها Platypodidae، Buprestidae، Scolytidae و Bostrichidae. يكون مستوى الإصابة أكثر حدة في المناطق الساحلية ذات المناخ شبه الجاف. سبب التكاثر الكثيف لبعض الحشرات في موت الأشجار منها حشرة *Platypus cylindrus* التي هي مصدر اتلاف حوالي 8% من الأشجار. وأثر *Stromatium fulvum* و *Lichenophanes numida* على نوعية الفلين وتسبباً في تجفافه وسرعة انفصاله عن الطبقة الخشبية.

E 29

حصر الحشرات المتلازمة مع البن تحت ظروف التخزين التقليدية في اليمن. حسن سليمان أحمد مهدي، قسم وقاية النبات، كلية الزراعة، جامعة صنعاء، ص.ب. 14430، صنعاء، اليمن، البريد الإلكتروني: hsamahdi@yahoo.com
تم إجراء مسح للحشرات المتلازمة مع البن تحت ظروف التخزين التقليدية باليمن في الفترة ما بين 4/1 وحتى 2004/7/11. خلال هذا المسح تم زيارة أربعة مواقع في أمانة العاصمة صنعاء هي: باب اليمن (سوق الملح)، مذبح، الصافية (حي البليبي) وحي الكويت. جمعت خلالها 22 عينة من البن التي اشتملت على حبوب جاهزة للطحن (6 عينات إحداهما مستوردة من أثيوبيا) وثمار جافة (أي حبوب لاتزال مغلفة بالقشور بحدود 12 عينة) وقشور الثمار والتي تدعى في اليمن بالقشر (2 عينة) إضافة إلى بقايا الشوائب (2 عينة) وذلك من أماكن تخزينها الرئيسية. من خلال الدراسة أمكن تحديد وتعريف سبعة أنواع من الحشرات تتبع فصائل مختلفة هي: فصيلة Tenebrionidae ويمثلها النوعين خنفساء الدقيق الصندنية *Tribolium castaneum* Herbst وخنفساء الدقيق المتشابهة *Tribolium confusum* Duval وجدا مرتبطين بالحبوب وخصوصاً منها المكسرة أو المتضررة وأيضاً على بقايا الشوائب؛ وفصيلة Silvanidae يمثلها النوع خنفساء الحبوب المنشارية *Oryzaephilus surinamensis* (L.) وجدت على كسر الحبوب وعلى بقايا الشوائب؛ وفصيلة Bostrichidae ويمثلها ثاقبة الحبوب الصغرى *Rhizopertha dominica* (F.) وجدت على بقايا الشوائب فقط، وكذلك النوع خنفساء اللوبيا الصينية *Callosobruchus chinensis* L. والتي تتبع فصيلة Bruchidae وجدت أيضاً على بقايا الشوائب؛ أما فصيلة Scolytidae ويمثلها النوع ثاقبة ثمار البن *Stephanoderes hampei* (Ferr.) وجد مرتبطاً بحبوب البن في العينة المستوردة من أثيوبيا بشكل خنافس بالغة مينة داخل الثقوب التي تعملها في أحد أطراف الحبة. ويعد هذا أول تسجيل لها في مخازن البن

الإناث) 1:2 وذلك وفقاً لدورة حياة الخنفساء في الظروف المخبرية وفي الحاضنة عند درجتي حرارة 25 و 30 °س. أظهرت النتائج أن دورة الحياة تبدأ من وضع البيض وحتى ظهور البالغات هي على التوالي 21، 24 و 21 يوماً، وكانت درجات الحرارة اليومية التجمعية 231، 168 و 251 °س، على التوالي.

E 24

رصد حفارات عذق/ساق النخيل *Oryctes spp* في المصائد الضوئية وعلاقتها بالعوامل البيئية في منطقة سينون- محافظة حضرموت- اليمن. سعيد عبد الله باعقود وصالح عمر البيتي، قسم وقاية النبات، كلية ناصر للعلوم الزراعية، جامعة عدن، اليمن، البريد الإلكتروني: baangood@yemen.net.ye

تعتبر حفارات عذق/ساق النخيل *Oryctes spp* من الآفات الرئيسة على النخيل بوادي حضرموت عبر المصائد الضوئية. وضعت ثلاث مصائد ضوئية من نوع Hstand المعدلة في ثلاثة مواقع مختلفة من حقول المزارعين في الفترة الممتدة من آذار/مارس 2003 وحتى شباط/فبراير 2004. وكانت المسافة بين المصيدة والأخرى 1 كم. وقد أوضحت النتائج أن الحشرات الكاملة تبدأ في الظهور خلال الأسبوع الأول من شهر آذار/مارس بأعداد ملحوظة بلغت 7 حشرات. ثم أزداد العدد تدريجياً حتى وصلت الأعداد ذروتها (188) في شهر أيار/مايو. ثم انخفض عدد الحشرات تدريجياً خلال الأشهر أيلول/سبتمبر، تشرين الأول/أكتوبر وتشرين الثاني/نوفمبر. واختفت الحشرة في المصائد الضوئية تماماً في شهر كانون الأول/ديسمبر، غير أنها عاودت الظهور مرة أخرى بأعداد قليلة في كانون الثاني/يناير وشباط/فبراير إذ بلغ العدد 5 و 7 حشرات في المصائد الضوئية، على التوالي. أظهر التحليل الإحصائي للمعطيات أنه لم يكن هناك فروق إحصائية معنوية (عند مستوى 5%) بين أعداد الحشرات المصطادة وبين ارتفاع وانخفاض درجات الحرارة، وارتفاع وانخفاض الرطوبة النسبية. كما لم تكن هناك فروق إحصائية معنوية (عند مستوى 5%) بين أعداد الحشرات الكاملة التي اصطادتها المصائد في الليالي المقمرة والليالي المظلمة. واتضح من نتائج هذه الدراسة أن للحشرة جيل واحد في العام، وأن النسبة الجنسية إناث: ذكور كانت 1.8 : 1؛ وأنه يمكن استخدام المصائد الضوئية كوسيلة رصد لتحركات الآفة في إطار برنامج الإدارة المتكاملة لهذه الآفة.

E 25

أنصاف النخيل القابلة للإصابة بحشرة نخيل التمر القشرية البيضاء *Parlatoria blanchardi* (Targ) بالمناطق الساحلية الغربية للجماهيرية. إيمان محمد جمهور¹، حلومة محمد كره² وحسن أحمد المغربي². (1) قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، البريد الإلكتروني: emanmb15@yahoo.com؛ (2) قسم علم الحيوان، كلية العلوم، جامعة الفاتح، ليبيا.

تعد حشرة نخيل التمر القشرية البيضاء *Parlatoria blanchardi* (Targ) من أهم الآفات الحشرية التي تصيب النخيل في جميع مناطق زراعته بالعالم، حيث تصيب الثمار مسببة تشوها وانخفاضاً في القيمة الغذائية. تهدف هذه الدراسة إلى تحديد أنصاف نخيل التمر المصابة بالحشرة القشرية البيضاء في المناطق الساحلية الغربية للجماهيرية والكثافة العددية للحشرة على كل صنف منها. أجريت الدراسة خلال الفترة من أيار/مايو إلى تشرين الثاني/نوفمبر، 2002 وشملت 11 منطقة ساحلية (الزاوية، قصر بن غشير، السواني، جنزور، عين زارة، تاجوراء، القره بولي، الخمس، بسيس، زليطن، تاورغاء). بينت النتائج أن جميع الأنصاف التي جمعت منها العينات (البرنصي، الطابوني، البكراري، البيوضي، العامي، الحلاوي، الحرة، الصعيدي، الفارشة، أم الحناش، أم قفتي، فزاني، نجمة، أم عظام) مصابة بالحشرة القشرية البيضاء، وسجلت أعلى كثافة عددية للحشرة على صنف "البكراري" (5000 حشرة/10 وريقات)، بينما لم تسجل إصابة على صنف "الصعيدي". وتراوحت كثافة الحشرة على بقية الأنصاف 0-790 حشرة/10 وريقات. إضافة للحشرة القشرية البيضاء، فقد سجل وجود الحشرة القشرية الخضراء *Asterolecanium phoenicis* على صنف "البيوضي" في منطقة السواني فقط.

E 26

الوفرة الموسمية لحشرة حفار العذوق *Phyllognatus excavatus* على نخيل التمر بالواحات الليبية. حلومة محمد كره، أحلام الطيب قاقا وعفاف رجب حمزة، جهاز تنمية وتطوير النخيل والزيتون، وحدة أبحاث النخيل والزيتون، القربولي، ليبيا، البريد الإلكتروني: kerra50@hotmail.com

أجريت دراسة لتحديد الوفرة الموسمية لحفار العذوق *Phyllognatus excavatus* (Coleoptera: Scarabaeidae) في بساتين النخيل في منطقة الواحات (أوجلة، جالو، إبحرة) لمدة عامين (2000 و 2001)، حيث استخدمت 12 مصيدة ضوئية مصنعة محلياً في مناطق الدراسة الثلاثة. أظهرت النتائج أن لحفار العذوق جيل واحد في السنة، وبلغت الكثافة العددية له في العام الأول 214 حشرة، و 323 حشرة في العام الثاني. سجلت أعلى كثافة عددية للخنفساء في شهر أيلول/سبتمبر في جميع مناطق الدراسة، وبلغت 87 خنفساء في السنة الأولى و 111 خنفساء في السنة الثانية. واختفت الحشرة في شهر كانون الأول/ديسمبر، كانون الثاني/يناير وشباط/فبراير من السنة الأولى والثانية. نتائج هذه الدراسة تدعم دور المصائد الضوئية

E 21

الفونا الحشرية لأشجار الفستق في سهول متيجة بالجزائر. صلاح الدين دومانجي¹، نادية بوكروي¹ ونجيب شبوطي-مزيو².
(1) قسم علم الحيوان الزراعي والغابي المعهد الوطني للعلوم الفلاحية، الحراش، الجزائر؛ (2) قسم البيولوجيا، كلية العلوم،
جامعة بومرداس، الجزائر، البريد الإلكتروني: chnadjiba@yahoo.fr
نظرا لزراعة الفستق الحلبي على نطاق واسع بالجزائر، رأينا من الضروري إحصاء أفات هذه الشجرة. إن الوضعية
الحالية للحشرات الضارة بأشجار الفستق بالجزائر لم تتم دراستها بعد. تم إجراء المسح الحقلّي لجمع العينات من بستان منتج
لثمار الفستق الحلبي والفستق الأطلسي خلال الفترة الممتدة من أيلول/سبتمبر 2004 إلى غاية أيلول/سبتمبر 2005.
أظهرت النتائج وجود الأنواع الحشرية التالية: *Gryllus burdigalensis*, *Gryllus bimaculatus*, *Ochrilidia tibialis*,
Acrida turrita, *Aiolopus strepens* و *Oedipoda caerulecens sulferecens* التي تنتمي إلى رتبة مستقيمات الأجنحة
(Orthoptera)، والنوع *Mantis religiosa* الذي ينتمي إلى فصيلة Mantidae. وهناك أنواع أخرى من غشائيات الأجنحة
(Hymenoptera) تم تسجيلها في ذات منطقة الدراسة نذكر منها: *Pheidole*, *Messor barbara*, *Cataglyphis bicolor*,
Bethylidae و *Pheidole sp. pallidula*, *Monomorium*, *Tetramorium biskrensis*, *Apis mellifera*. وتعتبر فصيلة
حشرات ملتهمة ليرقات غمديات وحرشقيات الأجنحة. بالإضافة لذلك، لوحظ بأن رتبة Coleoptera هي الأكثر تواجداً وممثلة
بفصيلة Carabidae وبيرقة واحدة، من فصيلة Curculionidae وجد *Polydrosus sp.* و *Apion sp.* ومن فصيلة
Staphylinidae وجد *Ocypus oleus* و *Ocypus sp.* ومن فصيلة Tenebrionidae وجد النوع *Blaps sp.* ومن فصيلة
Buprestidae وجد النوع *Anthaxia viminalis*. وتمثلت رتبة Diptera بالعوائل Asilidae (منها *Asida sp.*)،
Drosophilidae، Calliphoridae و Jassidae. وتمثلت رتبة ثنائية الأجنحة Hymiptera في فصيلة Aphidae.

E 22

حشرات الفستق الحلبي في السهوب الغربية (تلمسان) بالجزائر. صلاح الدين دومانجي¹، يحيى شبوطي²، نجيب شبوطي-
مزيو³. (1) قسم علم الحيوان الزراعي والغابي المعهد الوطني للعلوم الفلاحية، (2) المعهد الوطني للأبحاث الغابية. (3) قسم
البيولوجيا، كلية العلوم، جامعة بومرداس، نهج الحرية، 35000 بومرداس، الجزائر، البريد الإلكتروني:
chnadjiba@yahoo.fr

تعتبر زراعة الفستق الحلبي (*Pistacia vera* L.) من الزراعات النادرة في الجزائر. ونظرا للفائدة الاقتصادية
والتجارية التي تعود بها هذه الأشجار على البلاد، فقد أجريت دراسات هدفت إلى معرفة الحشرات التي تتواجد في بساتين
الفستق الحلبي لتحسين منتوجاتها ونشرها على صعيد وطني واسع. أظهرت النتائج وجود خمس رتب من الحشرات تتمثل في
غمديات الأجنحة (Coleoptera) التي تشكل نسبة 70% من مجموع الحشرات، من بينها حشرات خنفساء قلف أشجار الفستق
الحلبي (*Chaetoptelius vestitus*) التي تتغيب براعمه الفتية تاركة أنفاق يتراوح قطرها بين 1.40-2.05 مم وطولها بين
4.81-18.12 مم. كذلك نذكر من بينها غمديات أجنحة تتغدى على الأوراق متلفة مساحات معتبرة من كتلة النبات وهي
Mylabris oleae. وتمثل غشائيات الأجنحة (Hymenoptera) نسبة 10% نذكر منها *Tetramorium vestitus-Cataglyphis*
(Diptere) وتمثل 5% نذكر من بينها *Cyclorhapha sp.* و *Asida lefranci*. أما حشرات
مستقيمات الأجنحة (Orthoptera) فتمثل نسبة 10% منها *Sphingonotus caerulecens* وكذلك نذكر *Anachridium*
(eagyptium) التي وجدناها على شكل يرقة L5 انثى. وحشرات عصبيات الأجنحة (Nevroptera) نسبتها مماثلة لنسبة
مزوجة الأجنحة نذكر منها *Crysoperla carnea*.

E 23

دراسة حياتية لخنفساء عصارة الذرة (*Carpophilus dimidiatus*) على تمور النخيل مخبريا. نجلاء الزائدي وحلومة كرة،
قسم وقاية النبات، كلية الزراعة، جامعة الفاتح، طرابلس، ليبيا، البريد الإلكتروني: najla_elzaidi@yahoo.ca
أجريت دراسة حياتية لخنفساء عصارة الذرة (*Carpophilus dimidiatus*) (Coleoptera: Nitidulidae) مخبريا
وذلك بتربيتها على تمور نخيل نصف جافة. تم متابعة الخنفساء مخبريا باستخدام أزواج (ذكور وإناث) لتحديد خصوبة
الخنفساء. كما تم دراسة دورة الحياة للخنفساء تحت الظروف المخبرية (28 ± 0.5 °س)، وفي الحاضنة عند درجتي الحرارة
25 و 30 °س. بلغ معدل إنتاج البيض للأنثى 413 بيضة وفقاً لنتائج المتابعة المخبرية لخنفساء وبلغ متوسط طول فترة ما قبل
وضع البيض 3 أيام، ومتوسط فترة وضع البيض 59 يوماً، ومتوسط طول فترة ما بعد وضع البيض 9 أيام. وبيّنت النتائج أن
متوسط طول فترة حضانة البيض 3 أيام، وانسلخت اليرقات ثلاث مرات بعد فقس البيض، وبلغ متوسط عمر الأطوار اليرقية
12 يوماً، والتعذر 6 أيام. وبلغ متوسط عمر بالغات الذكور 77 يوماً، والإناث 71 يوماً، وكانت نسبة الجنس (الذكور إلى

الموسمي لمجموع فراشات هذه الحشرة باستخدام صائد الجذب الجنسي الفرمونية وتم فحص وعد محتويات المصيدة أسبوعياً من الفراشات المنجذبة حتى نهاية موسم النمو. وحدد العدد التقريبي لأجيال الحشرة وكثافتها وحجمها في الحقل وفترة كل جيل باستخدام عدة طرق (مثل طريقة المنحنى الطبيعي للحشرة خلال موسم النشاط) لتحديد عدد الأجيال وفترة كل جيل وحجمه. أظهرت النتائج أن طيران فراشة العنكب بدأ في بداية الأسبوع الأخير من شهر أيار/مايو وذلك بسبب التأخر بموسم الأمطار لهذا العام 2003 وشكلت ثلاثة قمم: القمة الأولى حدثت في الأسبوع الثالث من حزيران/يونيو (3 ذكور فراشات) والقمة الثانية حدثت في الأسبوع الأول من آب/أغسطس (10 ذكور فراشات) والقمة الثالثة حدثت في الأسبوع الثالث من أيلول/سبتمبر (20 ذكراً). أوضحت النتائج أن عدد الأجيال التي تم الحصول عليها خلال موسم 2003 ثلاثة أجيال كالاتي: الجيل الأول: يبدأ من الأسبوع الأول من حزيران/يونيو إلى الأسبوع الثالث من تموز/يوليو ومدته 7-8 أسابيع، الجيل الثاني: يبدأ من الأسبوع الثالث من تموز/يوليو إلى الأسبوع الثالث من آب/أغسطس ومدته 5-6 أسابيع، والجيل الثالث: يبدأ من الأسبوع الثاني من آب/أغسطس إلى الأسبوع الرابع من أيلول/سبتمبر ومدته 4-5 أسابيع. لوحظ أن الأعداد المرتفعة للفراشات تكون أعلى ما يمكن في الجيل الثالث ويعتبر أخطر الأجيال في خفض المحصول كما ونوعاً. وقدرت نسبة الإصابة في بداية قطاف العنكب بـ 31% في حين وصلت هذه النسبة مع نهاية الموسم إلى 95%، أما نسبة الضرر الظاهري (Damage-Score) فقدرت وحددت بتصنيف درجات الإصابة وفقاً لمجموعة قياسات لنقاط الضرر التام وقدرت لهذا الموسم بـ 27.71%.

E 19

تذبذب تعداد حشرة المانجو القشرية الرخوة على أشجار المانجو في مصر. السيد عبد الحميد علوان، معهد بحوث وقاية النباتات، 7 شارع نادي الصيد، الدقي، الجيزة 12311، مصر، البريد الإلكتروني: ssechem@hotmail.com
تعتبر قشرية المانجو الرخوة من الآفات الحشرية الهامة التي تصيب أشجار المانجو في مصر، وتسبب الإصابة بالحشرة أضراراً بالغة للأوراق عن طريق امتصاص العصير الخلوي وإخراج كميات كبيرة من الندوة العسلية التي تتساقط على الأسطح العلوية للأوراق مما يشجع نمو الأعفان، وتظهر الأشجار المصابة بالحشرة مسودة اللون. تمت دراسة ديناميكية تعداد الحشرة وتأثير بعض عوامل الطقس في نشاطها لمدة عامين (2004 و 2005) في محطة بحوث البساتين بالقناطر الخيرية بمحافظة القليوبية. اتضح من الدراسة وجود جيلين متداخلين للحشرة في العام، يظهر الجيل الأول في الربيع وفترة نشاطه في نيسان/أبريل والجيل الثاني يظهر في الخريف وفترة نشاطه في تشرين الأول/أكتوبر وتشرين الثاني/نوفمبر. وتبين من الدراسة أن الحشرة تتوزع عشوائياً على محيط الشجرة وتتواجد بأعداد كبيرة في المستوى السفلي من الشجرة وبأعداد متوسطة في المستوى الوسطي وبأعداد قليلة في المستوى العلوي. وجد من الدراسة أن درجة الحرارة الدنيا كان تأثيرها موجبا وعالي المعنوية في نشاط الحشرة أثناء عامي الدراسة، وكان تأثير درجة الحرارة القصوى سالبا عالي المعنوية في نشاط الحشرة خلال العامين أيضاً. وكان تأثير الرطوبة النسبية موجبا على نشاط الحشرة في كلا العامين غير معنوي في العام الأول وعالي المعنوية في العام الثاني. كما بينت الدراسة أن التأثير المشترك لعوامل الطقس المختبرة كان عالي المعنوية في نشاط الحشرة خلال العامين. وكانت نسبة الاختلاف التي يمكن أعزائها إحصائياً إلى التغيير في عوامل الطقس مجتمعة تقدر بـ 58.7% و 67.9% في العامين، على التوالي.

E 20

دراسات بيولوجية على حشرة المانجو الرخوة في مصر. السيد عبد الحميد علوان، معهد بحوث وقاية النباتات، 7 شارع نادي الصيد، الدقي، الجيزة 12311، مصر، البريد الإلكتروني: ssechem@hotmail.com
حشرة المانجو الرخوة من الحشرات الولادة التي تتكاثر لاجنسياً. تمت تربية الحشرة بنجاح على نباتات مانجو صغيرة مزروعة في أكياس بلاستيكية سوداء لمدة عام تحت الظروف المخبرية، وذلك لدراسة النواحي البيولوجية للحشرة مخبرياً. اتضح من النتائج وجود ثلاثة أجيال متداخلة للحشرة في العام تحت الظروف المخبرية وأن الحشرة تصل إلى الطور الكامل بعد مرورها بعمرين في طور الحورية. وجد من الدراسة تباين كبير في مدد أعمار طور الحورية في الأجيال الثلاثة حيث تراوحت مدة العمر الأول لطور الحورية من 22.4 إلى 27.4 يوم عند درجتي حرارة 24.1 و 16.8 °س، و 69.3 و 78.1% رطوبة نسبية والعمر الثاني من 28.1 إلى 88.6 يوم عند درجتي حرارة 24.1 و 16.8 °س، و 69.3 و 78.1% رطوبة نسبية، على التوالي. كما وجد أن فترة ما قبل وضع الحوريات الحديثة (الولادة) في الأجيال الثلاثة متباينة حيث تراوحت تلك الفترة من 33.4 إلى 109.2 يوم عند درجتي حرارة 23.7 و 13.7 °س، و 78.4 و 76.7% رطوبة نسبية. وكانت فترة وضع الحوريات الحديثة من 61.3 إلى 102.9 يوم عند درجتي حرارة 23، 16.6 و 78.5 و 77% رطوبة نسبية. وكانت فترة ما بعد وضع الحوريات الحديثة (وضع الأحياء) من 6.9 إلى 53.5 يوم عند درجتي حرارة 22.2 و 15.8 °س، و 71.4 و 77.1% رطوبة نسبية. تراوحت فترة حياة الحشرة الكاملة من 148.3 - 188.8 يوماً في الأجيال الثلاثة كما تراوحت الخصوبة من 54.9 إلى 95.8 حورية/ أنثى في الأجيال الثلاثة.

أقصر فترة للتطور اليرقي للحشرة (14.8 يوماً) تم الحصول عليها عند درجة حرارة 30 °س. وقد وجد أن اليرقات من العمر الأخير تقوم بإفراز خيوط حريرية تجمع بوساطتها عدة أوراق قريبة مع بعضها البعض مكونة شرنقة حريرية غير متماسكة كملجاً لطور العذراء. وقد بلغ المعدل الوسطى لفترة تطور العذراء 18.2 يوماً للذكور و 15.1 يوماً للإناث عند درجة حرارة 20 °س ورطوبة نسبية 70%. إن أنسب رطوبة نسبية جوية لخروج الحشرات الكاملة من طور العذراء كانت 65%. وقد حدثت عملية التزاوج في منتصف الليل وبعد يوم واحد من خروج إناث الحشرة وذكورها، واستغرقت هذه العملية حوالي 65 دقيقة. بلغ متوسط فترة تطور الجيل الواحد 29.5 يوماً للذكور و 28.7 يوماً للإناث عند درجة حرارة 25 °س ورطوبة نسبية 65%. استغرقت فترات ما قبل الإباضة والإباضة وما بعد الإباضة للإناث المخصبة معدلاً قدره 1.8 و 11.3 و 1.5 يوماً، على التوالي، تحت الظروف المختبرية العادية (23.2 °س ورطوبة نسبية 64.4%). وضعت الأنثى المخصبة معدلاً قدره 534 بيضة، معظمه تم وضعه في الأيام الأولى من فترة الإباضة، وذلك على السطح السفلي للأوراق القمية، وأكثر من 78% من البيض تم وضعه افرادياً والباقي كان متجاوراً. بلغت النسبة الجنسية (إناث: ذكور) 1:1. وقد جرى تسجيل 10 أجيال للحشرة في السنة الواحدة تحت الظروف المختبرية العادية.

E 16

بعض الجوانب البيئية والحياتية لحفار ساق التين (*Batocera rufomaculata* DeGeer). إبراهيم بركات البخيت، عوض عبد الله الصيغ ويوسف المشيخي، مختبر بحوث الحشرات، محطة البحوث الزراعية بصلالة، ص.ب. 475، سلطنة عمان، البريد الإلكتروني: bakh47@yahoo.com

أجريت دراسة لمعرفة بعض الجوانب الحياتية لحفار ساق التين (*Batocera rufomaculata* DeGeer) (Cerambycidae: Coleoptera) تحت ظروف المختبر خلال الفترة ما بين أيار/مايو وتشرين الثاني/نوفمبر، 1998، عند درجات حرارة 27-31 °س ورطوبة نسبية 60-80%. بلغ متوسط فترة ما قبل البيض، فترة الحضنة، فترة طور اليرقة وفترة طور العذراء 3.0، 6.4، 107.5 و 15.6 يوماً، على التوالي. وبلغ متوسط عدد البيض/الأنثى 274.3 بيضة، ويبدو أن للحشرة جيل واحد في العام. وعند دراسة الجوانب البيئية لحفار ساق التين، أظهرت النتائج أن الحشرة ذات نشاط ليلي، وتتغذى الحشرة الكاملة واليرقة على عوائل مختلفة. وبينت نتائج المسح الحقلية خلال الفترة ما بين 1999-2001 أن التين هو العائل المفضل للحشرة. تظهر الحشرة في شهر أيار/مايو ويزداد نشاطها إلى آب/أغسطس ومن ثم تبدأ أعدادها في النقصان. تتغذى الحشرة الكاملة على لحاء الساق والأفرع والقمة النامية، بينما تحفر اليرقة في لحاء الساق لتصل إلى منطقة الخشب، وتؤدي الإصابة الشديدة إلى موت الأشجار وسقوطها.

E 17

تواجد حشرة سيكاويل الأخضر على جفئات عنب الخمر في حجوط وبوركيا (متيجة - الجزائر). بوناصر فريدا، حمر المين سمير¹ وعتيقة قندوز بن ريمة². (1) معهد العلوم الفلاحية، الحراش، الجزائر؛ (2) جامعة سعد دحلب، صندوق بريد رقم 09، 09470، الصومعة، البلدية، الجزائر، البريد الإلكتروني: atiguen@yahoo.fr

أجريت التجارب في حجوط وبوركيا المتواجدة في متيجة بالجزائر، وعلى أشجار العنب من الطرز Merlot، Syrah، وCobernet sauvignon، Grenache. جمعت خمسة أوراق من عشرة أشجار من العنب لتعداد يرقات السيكاويل الخضراء من الجهة السفلية للأوراق، واستخدمت مصائد صفراء اللون للقبض على الحشرات البالغة. ظهر الجيل الأول للسيكاويل في شهر أيار/مايو محدثاً خسائر مهمة، وظهر الجيل الثاني في حزيران/يونيو وتسببت اليرقات في حدوث بعض الخسائر على أوراق العنب، بينما ظهر الجيل الثالث في شهر آب/أغسطس. نستنتج مما ذلك ظهور ثلاثة أجيال من السيكاويل الأخضر في المتيجة. وكان مارتان قالهالدين في بورديو (فرنسا) قد توصل إلى النتيجة نفسها.

E 18

رصد النشاط الموسمي لمجموع فراشات دودة ثمار العنب *Lobesia botrana* Sch. في حمص. محمد إبراهيم ونوفل الرضوان، مركز بحوث حمص، الهيئة العامة للبحوث العلمية الزراعية، ص.ب. 626، حمص، سورية، البريد الإلكتروني: gcsarhmcin@mail.sy

تعد دودة ثمار العنب *Lobesia botrana* Sch. من أهم وأخطر الآفات الحشرية اقتصادياً لما تسببه من أضرار هامة قد تصل أحياناً لأكثر من 50% من الإنتاج وخصوصاً خلال الجيلين الثاني والثالث، وتزداد الخسائر مع الإهمال والفشل في تطبيق برامج مكافحة المتكاملة لهذه الآفة. استهدفت هذه الدراسة رصد التغيرات الموسمية لمجموع نشاط دودة ثمار العنب *L. botrana* في مركز البحوث العلمية بحمص موسم 2003، وتحديد فترة نشاطها وعدد أجيالها وضررها الظاهري والحقيقي الذي تسببه لعناقد العنب اعتماداً على تقنيات حديثة في مجال الإحصاء البيولوجي المتقدم. تم دراسة رصد التغيرات في النشاط

0.74 و 0.74%، على التوالي، والجدير بالإشارة أن الطفيليين *Pediobius sp.* و *Baryscapus sp.* يسجلان لأول مرة في العراق على صناعة أنفاق أوراق الحمضيات.

E 13

دراسة بيئية عن فراشة براعم الزيتون/فراشة الياسمين *Palpita unionalis* Hübner وأعدائها الحيوية في سورية. محمود صبري لبابيدي، قسم وقاية النبات، كلية الزراعة، جامعة حلب، ص.ب. 12052، حلب، سورية، البريد الإلكتروني: mslababi@scs-net.org

في السنوات الأخيرة سُجِّلت آفة حشرية جديدة على أشغال الزيتون في معظم مشاتل الزيتون في سورية، والتي تم تعريفها على أنها فراشة براعم الزيتون (فراشة الياسمين) *Palpita unionalis* Hübner (Lepidoptera: Pyralidae)، التي تصيب براعم وأوراق أشغال الزيتون القمية والنامية. وخلال فترة قصيرة استطاعت هذه الآفة الحشرية الانتشار داخل جميع مناطق اكثار الزيتون في سورية، وأثرت سلباً في إنتاج مشاتل الإكثار، خاصة أن المشاتل كافة تعاني من الإصابة الشديدة بهذه الحشرة. أجريت دراسة بيئية على هذه الحشرة في بعض مناطق القطر العربي السوري خلال عامي 2003 و2004. وقد تُصنفت الدراسة مسحاً حقلياً للحشرة، وأعدائها الحيوية الطبيعية، والسلوك، والظهور الموسمي، والكثافة العددية للحشرة بأطوارها كافة وأعدائها الطبيعية. وقد دلت النتائج على أن نسبة الإصابة بالحشرة قد وصلت إلى 100% في مناطق الدراسة ولكلا العامين، مع اختلاف في موعد الظهور من منطقة لأخرى. إذ وصلت نسبة الإصابة إلى قمته في شهر أيلول/سبتمبر بمشغل بسيليا الزراعي/ادلب وشهر آب/أغسطس بمشغل حلب الزراعي، ولكلا العامين. وقد انحصر الظهور الموسمي للأطوار المختلفة للحشرة بين الأسبوع الأول من شهر أيار/مايو ونهاية شهر تشرين الأول/أكتوبر، ووصل تعدادها ذروته في الأسبوع الأخير من أيلول/سبتمبر بمشغل بسيليا الزراعي والأسبوع الثاني من آب/أغسطس بمشغل حلب الزراعي، ولكلا العامين. وقد جرى حصر وتسجيل، وللمرة الأولى في سورية، بعض الأعداء الحيوية الطبيعية من مفترسات وأشباه طفيليات وممرضات بكتيرية وفيروسية على الحشرة المدروسة. ويُعرض العمران الأول والثاني من طور اليرقة للإصابة بشبه طفيل داخلي فعال *Dolichognida trachalus* (Nixon, 1965) (Lepidoptera: Braconidae)، إذ تراوحت نسبة تطفله، في كلا المنطقتين، تحت الظروف الحقلية ما بين 5.6-85%.

E 14

دراسة أولية حقلية لحشرة نارية الزيتون *Euzophera pinguis* Haw في حقول الزيتون السورية. أيمن يراني¹، نذير حمدان²، رجا عيد²، أحمد الباشي¹ وحسام عبد الوهاب². (1) قسم بحوث الزيتون، ادلب، سورية؛ (2) مديرية زراعة ريف دمشق، دمشق، سورية، البريد الإلكتروني: muminad@scs-net.org

تحتل شجرة الزيتون مرتبة الصدارة بين الأشجار المثمرة في سورية، ويعد محصول الزيتون ثالث محصول اقتصادي من حيث الأهمية، إذ وصل عدد الأشجار المزروعة إلى 79 مليون شجرة منها 58 مليون شجرة مثمرة أعطت إنتاجاً تجاوز مليون طن ثمار عام 2004. وقد لوحظ تعرض العديد من مزارع الزيتون في مناطق ريف دمشق في نهاية عام 1999 لإصابة بالغة الأهمية بحشرة تمثلت على شكل تدهور سريع في الحالة الصحية لأشجار الزيتون مع يباس تدريجي للمجموع الخضري. هدفت دراسة هذه الحشرة إلى تقصي انتشارها وتوصيفها، وقد أظهرت النتائج أنها تسجل لأول مرة في سورية، كما أن لها ثلاثة أجيال (بينما لها جيلين فقط في مناطق متوسطة أخرى)، وسيتم عرض باقي النتائج حول واقع الأطوار غير الكاملة وفترات وجودها في الطبيعة.

E 15

دراسة حياتية عن فراشة براعم الزيتون/فراشة الياسمين *Palpita unionalis* Hübner في سورية. محمود صبري لبابيدي، قسم وقاية النبات، كلية الزراعة، جامعة حلب، ص.ب. 12052، حلب، سورية، البريد الإلكتروني: mslababi@scs-net.org

ظهرت في السنوات الأخيرة، فراشة براعم الزيتون *Palpita unionalis* Hübner (Lepidoptera: Pyralidae) كأفة حشرية خطيرة في جميع مشاتل إكثار الزيتون في سورية، وفي بعض بساتين الزيتون الحديثة العهد في الساحل السوري. تتغذى يرقات الحشرة على القمم النامية والأوراق الحديثة والطرية والبراعم لأشغال الزيتون، بحيث يمنع ذلك من النمو الطبيعي للأشغال الصغيرة الحجم، مؤدية في النهاية إلى تقزم هذه الشتول وتشويه نموها. هدفت هذه الدراسة إلى القاء الضوء على بعض من حياتيات هذه الآفة الحشرية، وذلك ضمن ظروف بيئية مختبرية محددة وغير محددة من درجات حرارة ورطوبة نسبية مختلفة. أظهرت النتائج أن فترة حضانة البيض تراوحت من 2.9 يوم (عند درجة حرارة 30°س) إلى 11.5 يوم (15°س)، في حين كان تأثير درجة الحرارة العالية (35°س) مميتاً لجنين الحشرة مما أدى إلى انعدام قفس البيض. لهذه الحشرة ستة أعمار/أطوار يرقية، أطولها العمر اليرقي الأخير الذي يعادل ضعف العمر اليرقي الأول. كما دلت النتائج أن

E 7

العناصر الإيكولوجية للحشرة القشرية السوداء (*Parlatoria ziziphi*) على شجرة الكليمنتين في منطقة بوفاريك (الجزائر). مهدي سلامي وم. بيش، فرع علم الحيوانات، المعهد القومي للعلوم الفلاحية، 16200 الحراش، الجزائر، البريد الإلكتروني: mergueb2002@yahoo.fr

إن دراسة الحشرة القشرية السوداء (*Parlatoria ziziphi*) (Homoptera: Diaspididae) في حقل أشجار الكليمنتين في منطقة بوفاريك (سهل متيجة) أظهر أن تطور هذه الحشرة يمر بأربعة أجيال في السنة (ربيعي، صيفي، خريفي وشتوي). يتأثر نمو هذه الحشرة ببعض الظروف كالشجرة العائل، والمناخ اللذان يسببان في بعض الأحيان موتها. كما تبين أن الأفراد الأكثر حساسية هي اليرقات والذكور، أما عند الأنثى، فسبب موتها خاصة فيزيولوجي. كما أن طفيلي الحشرة القشرية السوداء *Aspidiotiphagus citrinus* يمر بدوره بثلاثة أجيال خلال مدة الدراسة، وقد يلاحظ حضوره أكثر عند الإناث، لكن لوحظ أيضا انخفاض نشاطه بصفة كبيرة خلال الزمان.

E 8

علاقة الأملاح المعدنية في أوراق صنفين من أشجار الحمضيات (الليمون والكليمنتين) وعدوى حشرة *Parlatoria ziziphi* في الجزائر. حفيضة سايعي، معهد البيولوجيا، ص.ب. 270، طريق صومعة البليدة، جامعة البليدة، الجزائر، البريد الإلكتروني: hdhh@caramail.com

تعد حشرة *Parlatoria ziziphi* (Diaspididae: Homoptera) من بين الحشرات القشرية الاقتصادية التي تصيب الحمضيات في الجزائر. تنتشر هذه الحشرة على أوراق أشجار الحمضيات بمقادير مختلفة حسب أصناف الحمضيات. لهذا الغرض يتمحور العمل حول العلاقة التي تنشأ بين الأملاح المعدنية المكونة في الأوراق وعدوى *Parlatoria ziziphi*. أظهرت النتائج أن ارتفاع نسبة البوتاسيوم والصوديوم والمغنيزيوم في أوراق الحمضيات يساعد في انخفاض تكاثر هذه الحشرة. كما أظهرت التحاليل الكيميائية أن الليمون (Lemon) أغني بالبوتاسيوم من الكليمنتين (Clémentine) لذا هو أقل تعرض للإصابة بهذه الحشرة. ولم يسجل تأثير واضح في تطفل الحشرة نتيجة تباين النحاس والحديد في كلا الصنفين.

E 9

تغير أعداد الحشرة القشرية *Parlatoria pergandii* Comstock ونسب التطفل على الأجزاء المختلفة لشجرة الحمضيات في محافظة اللاذقية. أحمد راعي¹، قيس غزال²، نبيل أبو كف³ وفداء شمس⁴. (1) مديرية زراعة اللاذقية، ص.ب. 3100، اللاذقية، سورية؛ (2) مديرية زراعة اللاذقية، مركز اللاذقية لتربية وتطبيقات الأعداء الحيوية، ص.ب. 310، سورية، البريد الإلكتروني: Kaisgazal@shufbc.com؛ (3) جامعة تشرين ص.ب. 1446، اللاذقية؛ (4) اللاذقية، المؤسسة العامة للتبغ، مركز بحوث التبغ، اللاذقية، سورية.

تم دراسة تغير أعداد الحشرة القشرية *P. pergandii* على الأجزاء النباتية المختلفة لشجرة الحمضيات في ثلاثة مواقع في اللاذقية في عامي 2002 و 2003، كانت أعلى وأدنى نسبة معدل تواجد على الثمار في الموقع الأول 12.55 حشرة/ثمرة في كانون الأول/يناير، و 0.45 حشرة/ثمرة في أيار/مايو 2002، وأعلى وأدنى نسبة تطفل على الثمار بلغت 9.85% في آذار/مارس، 2003 و 0% في أشهر أيار/مايو، حزيران/يونيو وتموز/يوليو، 2002. أما في الموقع الثاني، فقد كان أعلى وأدنى معدل نسبة معدل تواجد 24.25 حشرة/ثمرة في آذار/مارس 2003، و 2.28 حشرة/ثمرة في أيار/مايو 2002 وأعلى وأدنى نسبة تطفل على الثمار بلغت 7.95% في آذار/مارس 2003 و 0% في أشهر أيار/مايو، حزيران/يونيو وتموز/يوليو 2002. أما في الموقع الثالث فبلغت 13.73 حشرة/ثمرة في تشرين الأول/أكتوبر 2002، و 0.075 حشرة/ثمرة في أيار/مايو 2002، وأعلى وأدنى نسبة تطفل على الثمار بلغت 16.98% في تموز/يوليو 2002 و 0% في أشهر أيار/مايو وأيلول/سبتمبر 2002. سجل ثلاثة أنواع من الطفيليات *Aphytis* spp، *Encarsia* spp، وطفيل آخر غير معروف على حشرة *P. pergandii*، والمفترسات الثلاثة التالية: *Chilocorus bipustulatus* Linnaeus، *Rhyzobius* spp، و *Cheletid mite*، والمفترس الأخير من العناكب وهو يفترس البيوض ولكنه كان نادر الوجود خلال فترة الدراسة.

E 4

دور الثمار المعيلة وبعض العناصر البيئية في ديناميكية مجموعات فراشة دودة التفاح (*Cydia pomonella* L.) وفي حدة إصابتها للثمار. علي بن الواعر، مخبر حماية النباتات، المعهد الوطني للبحوث الزراعية بتونس، 49 شارع الهادي الكراي، أريانة، ص. ب 2049، تونس، البريد الإلكتروني: belouaer.ali@iresa.agrinet.tn

تعد دودة التفاح من ألد الأعداء وأخطر الآفات داخل بساتين كل من أشجار التفاح والإجاص والسفرجل في تونس. إن ثمار التفاح والإجاص التي تتعرض للإصابة مبكراً منذ بداية الموسم تتساقط على الأرض و تتلف بأكملها خاصة في غياب التدخل في الإبان لحماية البساتين، غير أن الثمار التي تصاب لاحقاً بما فيها السفرجل ليست بدورها في مأمن من التساقط والتعفن وحتى في حالة عدم تعفنها وبلوغها مرحلة الجني فإنها تكون قد فقدت بعض قيمتها التجارية وأضحت غير قابلة للتصدير ولا حتى للخرن، بحيث غالباً ما تتسبب تلك الآفة في انخفاض هام في كمية و جودة المحصول من الثمار. ناهزت نسبة إصابة الثمار داخل بساتين التفاح وبساتين الإجاص وبساتين السفرجل 93، 83 و 100%، على التوالي، وذلك حتى في البعض من تلك التي يمكن أن تعد نسبياً في حماية من الحشرة إلا أن هناك ضرورة لرشها ببعض المبيدات المضادة لها. يتناول هذا العمل دراسة التأثير بين فراشة دودة التفاح والشجرة المعيلة لها إلى جانب إبراز الدور الرئيسي لتواجد الثمار على الشجرة في ديناميكية تلك الحشرة وامتداد فترة نشاطها وأهمية ذلك التواجد في تحديد نسبة الإصابة على المحصول. كما يتطرق البحث إلى مناقشة دور وتأثير بعض العناصر الثانوية (كثافة الحركة بالطريق المعبد وبالمسلك داخل الحقل) في تخفيض نسبة الإصابة على الثمار. ونختتم هذا البحث بدراسة بعض الطرق الخاطئة لدى إنشاء البساتين والتي من شأنها المساعدة على استفحال الآفة وتعقيد عملية المكافحة. كما نقدم بعض النصائح الملائمة للحد من مخاطر الحشرة ولترشيد عملية مكافحتها.

E 5

حصر للحشرات والاكاروسات التي تهاجم أشجار الكمثرى خلال موسم التزهير والإثمار في محافظة الإسماعيلية. محمد عبد النعيم محمد عثمان ومحمود فرج محمود، قسم وقاية النبات، كلية الزراعة، جامعة قناة السويس، الإسماعيلية، مصر، البريد الإلكتروني: naeim70@hotmail.com ،mfmfmousa@hotmail.com

أجريت التجربة الحقلية لمدة موسمين (2005 و 2006) في مزرعتين لأشجار الكمثرى بجامعة قناة السويس، بمحافظة الإسماعيلية، جمهورية مصر العربية. تم حصر الآفات الحشرية والأكاروسية المصاحبة لأشجار الكمثرى خلال موسمين متتاليين للأزهار والإثمار، تم خلاله تحديد موضع الآفة وموسم ظهورها والجزء النباتي المتضرر. أشارت نتائج الحصر إلى وجود 4 رتب حشرية ورتبة واحدة أكاروسية. كما أظهرت النتائج أن البق الدقيقي من أكثر الآفات الحشرية انتشاراً في الموسم الأول، وكانت حشرة *Cacopsylla pyricola* الأهم في الموسم الثاني، والتي لم تسجل في الموسم الأول.

E 6

تأثير المحرضات العضوية وطين الكاولين في درجة مقاومة أشجار الأجاص *Pyrus comminus* L. للإصابة بحشرة بسبلا الأجاص *Cacopsylla pyricola* Förster. جورج سعور وهالة اسماعيل، هيئة الطاقة الذرية، ص.ب 6091، دمشق، سورية، البريد الإلكتروني: gsaour@aec.org.sy

نفذت تجربة حقلية على أشجار الأجاص *Pyrus communis* L. في محطة أبحاث سرغايا شمال غرب مدينة دمشق خلال صيف عام 2005 لتحديد فعالية كل من المحرضات الحيوية وتقنية تغطية النباتات بطبقة رقيقة من طين الكاولين على حشرة بسبلا الأجاص *Cacopsylla pyricola* Förster. أظهر تعداد حوريات البسبلا بأن مجتمع الحشرة قد انخفض بشكل معنوي بعد تغطية الأشجار بطين الكاولين مقارنة مع الشاهد غير المعامل وبكفاءة استمرت حتى 12 أسبوعاً. سجل تواجد أعداد ضعيفة من أفراد البسبلا البالغة عند معاملة طين الكاولين مقارنة مع أعداد الحشرات البالغة عند الشاهد غير المعامل. لم ينجح المحرض الحيوي المطبق بواقع رشة كل 30 يوماً في كبح تطور أعداد الحوريات وعجز بالتالي عن إبقاء حجم مجتمع الحشرة في مستوياته المنخفضة طوال مدة الدراسة. تبين أن رش الأشجار بمبيد القراديات Envidor 240 sc يحول دون تطور واستفحال الإصابة بحشرة بسبلا الأجاص. لم تظهر أية أعراض جانبية سلبية على أشجار الأجاص نتيجة تغطيتها بطين الكاولين بل على العكس، فالأشجار المغطاة بطين الكاولين كانت أكثر نضارة وحيوية مقارنة مع نظيراتها أشجار الشاهد. تشكل تقنية تغطية النباتات بطبقة رقيقة من طين الكاولين طريقة بديلة وواعدة في إدارة برامج مكافحة حشرة بسبلا الأجاص في بساتين الأجاص.

E 1

دراسة منحني طيران فراشة دودة ثمار التفاح خلال السنوات الخمس السابقة باستخدام المصائد الفرمونية وعلاقته مع الظروف الجوية. جهان العبد الله¹ ووائل المتني². (1) مركز بحوث السويداء، الهيئة العامة للبحوث العلمية الزراعية، السويداء، سورية، البريد الإلكتروني: jihan_na@hotmail.com؛ (2) قسم إدارة الآفات، مديرية وقاية النبات، وزارة الزراعة، دمشق، سورية، البريد الإلكتروني: almatni@scs-net.org

علقت مصائد فيرومونية لدودة ثمار التفاح *Cydia pomonella* في بساتين التفاح التابعة لمركز بحوث السويداء (موقع عين العرب). روقت 3 مصائد منذ بداية فصل الربيع حتى قبيل موعد قطاف الثمار في الأعوام 2002-2006، وأحصي عدد الفراشات الملتقطة في هذه المصائد دورياً بمعدل مرة كل 2-3 أيام. حسب متوسط العدد المصطاد في المصيدة الواحدة، ورسمت الخطوط البيانية لها مع الزمن في كل عام. لوحظ وجود جيلين مكتملين كل عام مع ظهور جيل ثالث جزئي أحياناً. حسبت معنوية الارتباط بين الكم الحراري المتراكم فوق عتبة التطور المرجعية لدودة ثمار التفاح (10°س) وبين الأعداد المصطادة في المصائد. وجد أن موعد بدء ظهور الفراشات كان بعد مرور 8±99.2 د.ي. من بداية العام، وموعد بلوغها 50% من عدد الفراشات الكلي عند 67.2±137 د.ي. بعد أول اصطياد، وموعد انتهاء طيران الجيل الأول كان عند 152.6±386.5 د.ي. من بدء الاصطياد، أما بداية الطيران الثاني للحشرة فكان بعد مرور 20.6±534.5 د.ي. من بدء طيران الجيل الأول. يمكن استخدام البيانات المستخرجة لأجل بناء برامج تنبؤ مستقبلية لطيران فراشة ثمار التفاح في الحقل وبالتالي معرفة كافة التطورات الحياتية لها، وخاصة بدء طيران كل من الجيل الأول والثاني، عند معرفة الكم الحراري المتراكم من محطات التنبؤ الزراعية.

E 2

علاقة موعد دخول يرقات دودة ثمار التفاح *Cydia pomonella* L. في طور السكون مع موعد انبثاق فراشاتها وخصوبتها. وائل المتني¹ وجهان العبد الله². (1) قسم إدارة الآفات، مديرية وقاية النبات، وزارة الزراعة، دمشق، سورية، البريد الإلكتروني: almatni@scs-net.org؛ (2) مركز بحوث التفاحيات، الهيئة العامة للبحوث العلمية الزراعية، السويداء، سورية. جمعت يرقات دودة ثمار التفاح *Cydia pomonella* L. الساكنة من بستان تفاح غير مكافح بالمبيدات في جبل عرمان، السويداء في عامي 2002 و2003، وذلك بشكل أسبوعي بدءاً من بداية آب/أغسطس حتى نهاية تشرين الأول/أكتوبر، وعزلت في مجموعات منفصلة حسب تاريخ الجمع. وضعت هذه اليرقات في البستان نفسه في قفص محمي ضمن الظروف الحقلية. حلل موعد خروج الفراشات في الربيع في بداية الموسم المقبل عبر عزل كل مجموعة فراشات في قفص تربية وتكاثر مستقل. كان لموعد دخول اليرقات طور السكون في نهاية الصيف علاقة مع موعد انبثاقها في بداية الربيع اللاحق، فظهرت يرقاتها السكون في شهر أيلول/سبتمبر من الموسم السابق، كذلك تأخر خروج الفراشات التي دخلت يرقاتها السكون في شهر تشرين الأول/أكتوبر بخمسة أيام أخرى. وصل عدد الفراشات المنبثقة إلى نصف العدد الكلي عند متوسط 90 د.ي. من ظهور أول فراشة، واكتمل انبثاق الفراشات تماماً بعد متوسط 225 د.ي. بدءاً من ظهور أول فراشة باعتماد عتبة التطور 10 م. بلغ متوسط خصوبة الفراشة من يرقات مشتية مجموعة حقلية 17.2 و 6.5 و 12.5 بيضة/لأنثى للمواسم 2001/2000 و 2002/2001 و 2003/2002 على التوالي، ضمن الظروف الطبيعية في المنطقة المدروسة. وبلغ متوسط خصوبة الفراشات الناتجة من يرقات تطورت خلال أواخر الربيع 62 بيضة/للفراشة الأنثى مما يدل على أن للسكون تأثير كبير في خفض الخصوبة الممكنة لفراشة دودة ثمار التفاح.

E 3

دراسة حيوية لذبابة الفاكهة *Ceratitis capitata* Wiedmann, 1824 في واحة تقليدية وأخرى حديثة باستعمال نوعين من الطرق التنبؤية. مالك لعماري ومصطفى سليمان بوعصبانة، جامعة باتنة، 05000، باتنة، الجزائر، البريد الإلكتروني: laamarimalik@yahoo.fr

أنتضح من خلال هذه الدراسة أن الواحات الجنوبية بكثافة غطائها النباتي وتنوع غلالها توفر كل الظروف المناخية والغذائية الملائمة لتكاثر ذبابة الفواكه. سمح استعمال المصائد الجنسية بتعداد 6 أجيال للحشرة، وبلغ عدد الذكور 374.5 في المصيدة الواحدة خلال أسبوع. بينت النتائج أيضاً أن الواحات التقليدية التي يصل فيها الغطاء النباتي إلى نسبة 85% هي الأكثر ملائمة لهذه الذبابة، حيث وصل معدل ما تم اصطياده إلى 3839 فرداً. أما في الواحة الحديثة التي تتميز بقلة غطاءها النباتي (57%) ونقص تنوعه، لم يتجاوز هذا العدد 2630 ذبابة. من خلال هذه الدراسة تم التعرف أيضاً على أن الطريقة التنبؤية الثانية والتي تعتمد على درجات الحرارة لا يمكن الإعتماد عليها تحت الظروف المناخية للصحراء.

حشرات اقتصادية

والمزرعة، التي تنتمي لفصائل مختلفة، محدثة أوبئة اقتصادية مهمة في أصقاع العالم. ويتوقف استعمار الفيوتوبلازما للنبات على الفصل، العضو، ونوع العائل والممرض، وتؤدي إلى أعراض مختلفة نظراً لتداخلات معقدة مع فيزيولوجية العائل. ويعدّ التشخيص الدقيق لهذه الممرضات مهماً لإدارة الأمراض المرافقة للفيوتوبلازما. والفيوتوبلازما صعبة الكشف نظراً لتركيزها المنخفض، وبخاصة في العوائل الخشبية، ولتوزعها غير المنتظم في النباتات المصابة. ويمكن حالياً تشخيص هذه الكائنات بصورة روتينية بتقاني مرتكزة على الحمض النووي، وبخاصة تقنية PCR. ويمكن الحصول على مستحضرات الحمض النووي DNA الكلي من نوعية جيدة والغني بـ DNA من الفيوتوبلازما بتضمين خطوة إغناء بالفيوتوبلازما تتطلب وقتاً كبيراً، علماً أنه تم تطوير بروتوكولات أبسط باستخدام أعمدة ميكروسبِن تجارية. ويمكن الوصول إلى كشف الفيوتوبلازما بنجاح في النواقل الحشرية بإجراءات استخلاص أسرع للـ DNA الكلي، وقد يكون ذلك عائداً إلى معدل عالٍ من البكتيريا في جسم الحشرة. وقد تم تحديد بادئات عامة متخصصة بالفيوتوبلازما مثل 16S rRNA و 16S-23S للفيوتوبلازما المنتمية إلى مجاميع سلالات مختلفة. وتعدّ البادئات المرتكزة على تتالي الريبوزومات الأكثر استخداماً في التشخيص الروتيني للفيوتوبلازما. كما تم أيضاً استهداف بادئات شائعة وأخرى خاصة بمجموعة معينة لتتالي مورثات أخرى، ولتتالي بدون أي وظيفة ولتتالي البلازميدات الموجودة في الفيوتوبلازما. ويتضمن التشخيص الروتيني عادة استخدام PCR العشي. كما تم حديثاً اقتراح تقنيات أخرى مثل RT-PCR, real time PCR, PCR-ELISA وغيرها.

S 14

التشخيص الجزيئي للفيروسات النباتية. خالد مكوك وصفاء قمري، المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: k.makkouk@cgiar.org

يعتبر التشخيص الدقيق للفيروسات الأساس لإيجاد الحلول العملية المناسبة لإدارة الأمراض الفيروسية النباتية. أسهمت التطورات الحديثة في مجال علوم التقنيات الحيوية والبيولوجيا الجزيئية بدور فاعل في تطوير اختبارات تشخيصية سريعة وذات حساسية عالية. يعد اكتشاف اختبار اليزا (ELISA)، الذي يعتمد على استخدام الأجسام المضادة وحيدة أو عديدة الكلون، خطوة فاعلة في زيادة الدقة والحساسية عند تشخيص الفيروسات. كما أن تطوير اختبار بصمة النسيج النباتي (TBIA)، وهو أحد تحويلات اختبار اليزا، أدى إلى تسهيل عملية التشخيص وتقليل تكلفته، وسمح استخدامه بالكشف عن الفيروسات في الأماكن التي تكون فيها الإمكانات قليلة أو معدومة. وسرع اختبار الكروماتوغرافيا المناعي (ICA) - وهو تحويل آخر لإختبار اليزا - عملية تشخيص الفيروسات، حيث يمكن الحصول على النتيجة خلال 10-15 دقيقة مقارنة بـ 2-3 ساعات لإختبار بصمة النسيج النباتي؛ إلا أن تكلفة اختبار الكروماتوغرافيا المناعي أعلى بكثير من تكلفة اختبار بصمة النسيج النباتي. وقد شكل تطوير الإختبارات التي تعتمد على الحمض النووي بعداً آخر في مجال تشخيص الفيروسات، ومن أكثرها شيوعاً إختبارات تهجين الحمض النووي المكمل (cDNA hybridization) والتفاعل المتسلسل للبوليمراز (PCR) اللذين أديا إلى الكشف عن تركيزات منخفضة جداً من الفيروسات. بالإضافة لذلك، وجد بأنه يمكن استخدام التفاعل المتسلسل للبوليمراز لتأكيد نتائج اختبار بصمة النسيج النباتي، وذلك عن طريق إعادة قص مقاطع النباتات المفحوصة باختبار بصمة النسيج النباتي ومن ثم فحصها مرة أخرى بالتفاعل المتسلسل للبوليمراز. هذا، وقد نجحت هذه الطريقة في تشخيص الفيروسات ذات الحمض النووي من النوع RNA أو من النوع DNA. علاوة على ذلك، فقد تم عزل الأحماض النووية للفيروسات (DNA و RNA) من مقاطع النباتات المطبوعة على أغشية النيتروسيليلوز، وكانت تمثل عينة جيدة لتضاعف الحمض النووي للفيروس عن طريق التفاعل المتسلسل للبوليمراز متبوعاً بعمليات الكلونة ومن ثم دراسة تسلسل القواعد النيتروجينية للحمض النووي فيما بعد. وتعتبر هذه الطريقة مفيدة جداً لتحديد هوية فيروسات أو سلالات فيروسية جديدة.

الفطرية التي تعيش في بيئات متنوعة مثل: داخل (ضمن) الأنسجة النباتية، على سطح الأوراق، في البذور، في مياه الري وقد تم دعمها بدراسة بعض الخصائص النوعية مثل السمومية والمقاومة للمبيدات، بالإضافة إلى أنه قد تم استخدام تقنيات التشخيص الجزيئي في كشف أنواع عديدة من الفطور في الحجر الفطري. كانت الايزوزيمات ومسابر الـDNA من أوائل المؤشرات الجزيئية التي استخدمت في الكشف والتمييز ما بين الأنواع الفطرية المختلفة، ومن ثم أتى التشخيص الجزيئي المعتمد على التفاعل التسلسلي للبوليميراز ليسرع عملية التمييز من خلال إيجاد طرائق للكشف أكثر سرعة وأكثر حساسية. يمكن التمييز ما بين الفطريات على مستوى الأنواع من خلال تصميم بادئات تتعرف على مناطق مختارة تتصف بأنها مقاطع من الـDNA (محفوطة-متشابهة) ما بين الأنواع مثل وحدات المورثات المسؤولة عن الـrRNA ومن ثم تستكمل العملية بتوصيف قطعة الـDNA التي تتم مكاثرتها بتلك البادئات. لقد أصبحت وحدات المورثات المسؤولة عن الـrRNA معروفة ومستخدمة جداً وذلك لعدة أسباب، فهي توجد بعدد من النسخ يصل لعدة مئات في المجين (الجينوم)، كما أنها مكونة من مناطق محفوظة جداً ومناطق مختلفة. لقد تم استخدام المقاطع المأخوذة من تحت الـrRNA في عمليات التصنيف وفي الدراسات الوراثية، في حين استخدمت المناطق المحفوظة سواء من المنطقة الداخلية المنسوخة (ITS) أو المنطقة الفاصلة بين المورثات (IGS) كهدف للكشف عن الفطور. لقد تم تطوير تقنيات البصمة الوراثية المعتمدة على الـPCR مثل (AFLP، SSR، RAPD) ذات الحساسية والدقة العالية في عملية التشخيص. حديثاً تم تطوير تقنية مصفوفات الـDNA المعروفة أيضاً بالشريحة (الرقيقة) أو رقيقة الـDNA وهي تهدف لمسح كامل المجين والتعرف عليه على رقيقة أو شريحة واحدة، وقد أصبحت هذه التقنية متاحة وقابلة للتطبيق في مجال التشخيص الجزيئي للفطور. يتم تصنيع رقائق الـDNA بطريقة آلية سريعة جداً، وعادة تكون من الزجاج، وتتم عليها عملية تهجين جزئي ما بين مسابر متخصصة ومقاطع الـDNA الهدف المكتملة لها. بهذه الطريقة، يتم بشكل متواز كشف وتحديد عدد كبير من المورثات في عدة أنواع من الكائنات الدقيقة. إن التجارب مع شريحة أو رقيقة واحدة من الـDNA يمكن أن يزودنا بمعطيات ومعلومات هائلة عن عدد كبير من المورثات بشكل مترام. تسلط هذه المحاضرة المرجعية الضوء على تطبيق عدة تقنيات بهدف التشخيص الجزيئي للمرضات الفطرية، وهي تعتمد أساساً على المعلومات التي وجدت في المقالات بالإضافة إلى معطيات البحث الشخصي للكاتب.

S 12

التشخيص الجزيئي للبكتيريا الممرضة للنبات. سيمون وولر، جون إلفينستون، نيل باركينسون وريتشارد ثوابيس، مخبر العلوم المركزي، Sand Hutton، York، Y041 1LZ، المملكة المتحدة، البريد الإلكتروني: s.weller@csl.gov.uk
لقد أعطت تجارب التفاعل التسلسلي للبوليميراز PCR المعتمدة على تحليل مخطط الزمن الحقيقي وبوجود (صبغات أو ملونات) متوهجة وعوداً كبيرة لتشخيص البكتيريا الممرضة للعديد من النباتات. تؤدي عملية تكرار دورات التفاعل التسلسلي للبوليميراز في هذا النوع من التجارب لمكثرة نواتج هذا التفاعل (والتي هي الـDNA) بشكل كبير يترجم بزيادة كثافة التوهج ومن ثم يتم التقدير الكمي لقطعة الـDNA المتخصصة (النوعية) والتي هي الهدف من خلال تحليل مخطط الزمن الحقيقي لمراحل التفاعل. يسمح هذا النوع من التحليل بغرلة وتحليل عدد كبير من العينات وذلك بسبب عدم الحاجة لخطوات تتبع عملية الـPCR (مثل استخدام الهلامات في عملية الرحلان الكهربائي). تم تطوير التجارب التي أجريت على *Ralstonia solanacearum* spp. و *Agrobacterium* و *Xanthomonas fragariae* في مخبر العلوم المركزي (CSL)، في حين طوّرت التجارب المتعلقة بـ *Clavibacter michignensis* ssp. *sepedonicus* و *Erwinia amylovora* في مكان آخر. إن الخطوة الأساسية (المفتاحية) في تطوير أي اختبار هي الاختيار المناسب لمقطع الـDNA الذي سيستخدم كهدف وكذلك تطوير تقنية مناسبة لاستخلاص الـDNA من المادة النباتية مباشرة. لقد تم حديثاً في CSL تصميم تجربة التفاعل التسلسلي للبوليميراز بالزمن الحقيقي التي سمحت بكشف وتحديد بكتيريا التبقع الزاوي على أوراق الفريز *Xanthomonas fragariae* (xf) ذلك باستخدام معطيات لمقاطع DNA مأخوذة من المورثة *gyrase B*. على الرغم من وجود هذه المورثة في جميع أنواع البكتيريا، إلا أن الدراسة التي أجريت لمقارنة مقاطع من هذه المورثة في أنواع بكتيرية قريبة من بعضها البعض قد سمحت بالعثور على مقاطع معينة يمكن استخدامها كمسابر نوعية أو كبادئات PCR متخصصة بالبكتيريا *Xf*. لقد سمحت عملية الجمع ما بين هذه التقنية RT-PCR والطريقة السريعة والحساسة في استخلاص الـDNA بكشف الكائن المرض عند وجوده بمعدل 10^3 خلية في وسط التفاعل - على مستوى مجتمع بمرحلة كمون العدوى بالبكتيريا *Xanthomonas fragariae*.

S 13

التشخيص الجزيئي للفيوتوبلازما. كريستينا مارشازي، معهد الفيروسات النباتية، المركز الوطني للبحوث، سترادا دلا كاكسي، 73، I-10135 تورينو، إيطاليا، البريد الإلكتروني: marzachi@ivv.cnr.it
الفيوتوبلازما كائنات لا يمكن زراعتها، وهي مرضات تفتقر إلى جدار خلوي ومحدودة على اللحم، وتنتقل بالطريقة المثابرة بواسطة نطاطات الأوراق ونطاطات النباتات (رتبة غشائيات الأجنحة وفصيلة Auchenorrhyncha) وأنواع البسيلا (رتبة غشائيات الأجنحة وفصيلة Stemorrhyncha) وتترافق هذه الكائنات مع أمراض تصيب عديداً من الأنواع النباتية البرية

S 9

المكافحة الميكروبية للأفات الحشرية: هل هي بديل فاعل وأمين بيئياً؟ منير الحسيني، مركز مكافحة البيولوجية/الأحيائية، كلية الزراعة، جامعة القاهرة، الجيزة، مصر، البريد الإلكتروني: biologicalcontrol@hotmail.com

تستخدم بعض الفيروسات والبكتيريا، والفطور الممرضة للحشرات كبدايل لمبيدات الآفات التقليدية في مكافحة الميكروبية للأفات الحشرية. ولا يجب تعميم استخدامها إذ لكل أفة حالتها الخاصة. وقد أثبتت حالات محددة نجاح وفعالية الفيروسات الممرضة للحشرات في مكافحة بعض آفات أشجار الغابات من حرشقيات وغشائيات الأجنحة في أوروبا والمخلة منها إلى أمريكا وكندا، كذلك في مكافحة دودة ورق القطن، فراشة درنات البطاطس/البطاطا، ودودة الشمع الكبيرة. وهذه الفيروسات متخصصة على الحشرات المستهدفة وجدّ أمانة على التنبؤات والبيئة وهذه. كذلك أثبتت البكتيريا *Bacillus popilliae* نجاحاً كبيراً في مكافحة الخنفساء اليابانية بمعاملة واحدة للتربة إمتد تأثيرها لعشرة سنوات متتالية، ويختص كل من تحت الأنواع الرئيسية الثلاثة للبكتيريا *B. thuringiensis* في إصابة يرقات رتبة محددة حيث يختص *B.t. kurstaki* بحرشقيات الأجنحة، *B.t. israelensis* بذات الجناحين، *B.t. tenebrionis* بغمديات الأجنحة. وتعتمد المستحضرات التجارية على الأنماط التي لا تنتج السم الخارجي *exotoxin* لأنه سم عام غير متخصص يهدد الإنسان وكافة الكائنات في التربة وبالتالي فهو غير آمن بيئياً. أما بالنسبة للفطور، فيقتصر استخدام بعضها تحت ظروف الرطوبة العالية والحرارة اللازميتين لإنبات الأبواغ/الجراثيم الكونيدية والتي تتوافر في الزراعات المحمية تحت الفينيات الزجاجية لمكافحة المن والتربس والذباب الأبيض. كما ينجح استخدامها ضد الآفات الحشرية في المناطق المدارية وتحت المدارية كما في مكافحة آفات الكاكاو في البرزيل. وقد تسبب بعض الفطور حساسية للإنسان، ونظراً لعدم تخصصها فهي تصيب الحشرات غير المستهدفة من الحشرات، المتطفلات والمفترسات البالغة تحت ظروف التطبيق الحقلية، والفطور ذات تخصص ضعيف وقد تشكل خطراً للتنوع الحيوي.

S 10

الجاذبات واستراتيجية القتل: اتجاه أمين واعد لإدارة الآفات يمكنه الاستغناء عن استعمال مبيدات الآفات المصنعة. علي رسمي، قسم وقاية النبات، المركز القومي للبحوث، الدقي، القاهرة، مصر، البريد الإلكتروني: aly_rasmy@hotmail.com

يناقش الباحث النهج التستعمل محفزات الحشرات للتأثير في سلوك الآفات. ويلقي الباحث الضوء على الكيفية التي يتم فيها جمع محفزات الحشرات مع طرائق أخرى آمنة في استراتيجيات مكافحة متكاملة لزيادة فاعلية هذه الاتجاهات. إن المكونات الرئيسية لهذه الاستراتيجيات هي مراقبة الآفات، المماكبلت الكيميائية، مقاومة النبات العائل، المحاصيل الصاعدة والمبيدات الانتخائية و استراتيجية القتل أو عوامل مكافحة البيولوجية/الأحيائية. ويتم دمج هذه المكونات تحت مصطلح استراتيجية الجاذبات والقتل أو استراتيجية الدفع والسحب. وينبغي أن يستمر البحث لدراسة الكيفية التي تنتج الحشرات فيها بإنتاج الفيرومونات وكيف تقوم هذه الأخيرة بإحداث استجابة وتأثيرات هذه الاستجابات.

الحلقة العلمية الرابعة: التشخيص الجزيئي لأنواع الآفات التي تصيب النباتات

S 11

التشخيص الجزيئي للممرضات الفطرية. إ.إ. بابولوماتس، مختبر أمراض النبات، جامعة أثينا الزراعية، 11855 أثينا، اليونان، البريد الإلكتروني: epaplom@aua.gr

ساهمت التطورات الحديثة في البيولوجيا الجزيئية في تشخيص الممرضات الفطرية في النباتات من خلال إيجاد طرائق جديدة متقدمة تسمح بالكشف السريع وبالتحديد الكمي والنوعي للكائنات الموجودة. وعلى الرغم من تطبيق التشخيص الجزيئي واستخدامه على فطور من بيئات متنوعة إلا أن تطبيقه على الممرضات من الأنظمة البيئية الأرضية كان محدوداً وذلك بسبب تعقيد الظروف البيئية المحيطة بهم وخاصة بالنسبة للممرضات المنقولة بالهواء. لقد تم خلال السنوات الماضية تطوير العديد من الآليات (الطرق) التقليدية المتباينة في درجة كفاءتها وذلك بهدف كشف للممرضات الفطرية التي تنتقل عن طريق التربة وتعريفها وتوصيفها. تعتبر طريقة تنميتها الكائنات على بيئات انتخائية متخصصة من أكثر الطرق استخداماً في هذا المجال فهي تهدف لاستبعاد أغلب كائنات التربة والاحتفاظ بالفطور المرغوبة فقط. ولكن على الرغم من ذلك، فقد كان التعامل مع فطور التربة يمثل دائماً تحدياً كبيراً بسبب تعقيد الظروف البيئية التي توجد فيها هذه الكائنات. لقد ثبت في كثير من الحالات بأن الحصول على الكائنات (الفطور) من أوساط انتخائية ليست مستقلة أي أنها تتأثر بعوامل متعددة، فعلى سبيل المثال قد يستبعد الكائن المستهدف أو يمنع من النمو بسبب وجود منافس أفضل منه على البيئة الانتخائية، كما أن المواصفات الشكلية للكائنات يمكن أن تكون مشتركة ما بين عدة أنواع بالإضافة إلى أن تحيز الباحث هو عامل مهم في هذا النوع من التجارب وبالتالي فإن مجموع هذه العوامل تؤثر في النتائج المستخلصة من هذه الدراسة. بناءً على ما تقدم، كان لابد من اللجوء للتقنيات الجزيئية بهدف تشخيص فطور التربة. لقد انتشرت تقنيات الـDNA لتطال الكشف (التعرف) عن الممرضات

التمويل المالي للبحوث. ولاشك أن هناك حاجة للتغلب على مثل هذه المعوقات وتحسين فعالية برامج الـ IPM من خلال فهم أفضل للنظام البيئي للمحصول سواء فوق أو تحت سطح التربة، وذلك علاوة على الحاجة لإيجاد برامج محسنة جديدة للزراعة العضوية في بيئات المحاصيل المشجعة لتطور الآفات، والأخذ بميزة الفرص التسويقية للمنتجات الزراعية. كما أنه يلزم التأكيد على دور تدريب المزارعين العضويين أو مجموعات المزارعين كمقوم أساسي في تعلم وتنفيذ العمليات أو الإجراءات الجديدة.

S 7

الوضع الراهن للتطعيم الخضري كبديل لبروميد الميثيل. محمد البصري، معهد الحسن الثاني للزراعة والبيطرة، ص.ب. 6202، الرباط، المغرب، البريد الإلكتروني: m.besri@iav.ac.ma

يعد التطعيم واحداً من التقاني الواعدة المستخدمة كبديل لبروميد الميثيل. ويستخدم التطعيم أصولاً مقاومة لوقاية الخضراوات الحساسة من الفطور المنقولة مع التربة (*Verticillium dahliae*، *Pyrenochaeta lycopersici*، *Meloidogyne spp.*). وبالإضافة لمكافحة الأمراض المنقولة مع التربة، فإن للتطعيم الخضري أيضاً أعراض عديدة أخرى كتحفيز النمو وزيادة الغلة، وتحمل درجات الحرارة المنخفضة، وزيادة فترة النمو ونوعية الثمرة. وهذه التقنية، التي كانت تعتبر باهظة التكاليف، تستخدم حالياً تجارياً على نطاق واسع في عدد من الدول النامية والمتقدمة نظراً لانخفاض أسعار الشتول المطعمة، وانخفاض كثافة النباتات المطعمة/هكتار وزيادة الغلة كما ونوعاً. وفي الزراعة المحمية للبنندورة/الطماطم فإن الكثافة النباتية للشتول غير المطعمة والمطعمة في الهكتار الواحد هي في حدود 20,000 (ساق واحد/نبات) و 10,000 (ساقين/نبات). وعند استخدام النباتات المطعمة، يمكن الحصول على الغلة نفسها أو حتى على بكثافة نباتية تعادل النصف. كما أن النوعية معبر عنها بالنسبة المئوية للإنتاج المصدر تكون أعلى أيضاً. وفي العديد من الدول، نجد أن معظم إنتاج الخضراوات، وبخاصة في الزراعات المحمية هو من نباتات مطعمة إذ أن 100% من البطيخ الأحمر في إسبانيا هو من نباتات مطعمة، وبهذه التقنية أمكن استبعاد استخدام بروميد الميثيل. على أن الاستخدام التجاري الواسع للتطعيم قد يكون محدوداً بتوافر الأصول المتحملة للأمراض المحلية. كما أن مقاومة الأصل قد تكسر بظهور سلالات جديدة من المرض، وتحت الظروف المناخية كدرجات الحرارة العالية والملوحة.

S 8

استعمال البدائل الكيميائية لمبيدات الآفات المصنعة للمحافظة على صحة النباتات في محاصيل البطاطا/البطاطس المكافحة بالطريقة الخضرية/ الكلونات. إدوارد راد كليف، قسم الحشرات، جامعة منيسوتا، سانت بول، مينيسوتا، 55108-6125، الولايات المتحدة الأمريكية، البريد الإلكتروني: DADCL001@umn.edu

تعد الفيروسات المنقولة بحشرات المنّ السبب الرئيس لرفض لوطات بذور البطاطا/البطاطس أو خفض درجتها لإعادة التصديق. ويميل الزراع لاعتبار مبيدات الحشرات خط دفاعهم الأول ضد انتشار الموسم الحالي لفيروسات البطاطا/البطاطس في بذور البطاطا/البطاطس على أن استعمال هذه المبيدات لا يعطي الفائدة المرجوة في الحد من انتشار الفيروسات. وتستطيع مبيدات الحشرات منع انتشار فيروس التفاف أوراق البطاطا/البطاطس من مصادر ضمن الحقل نظراً لامتداد فترة سكون الاكتساب لهذا الفيروس المنقول بالطريقة المثابرة. على أن حشرات المنّ المجنحة الحاملة للفيروس لا تقتل بالسرعة الكافية لمنع انتقال الفيروس المذكور حتى عند وجود بقايا المبيد القاتل للمنّ. وكافة فيروسات البطاطا/البطاطس الأخرى تنتقل أثناء بحث المن عن الغذاء خلال عدة ثواني، الأمر الذي يجعل هذه المبيدات ذات أهمية ضعيفة. وتشمل البدائل غير الكيميائية لمكافحة الفيروسات سياسات لتخفيض التعرض للإصابة مثل تحديد جيل إكثار البذور، التفقيش الحقل الصيفي والاستئصال للحد من مصادر لقاح الفيروس ضمن الحقل، والإكثار خارج المواسم لتحت نماذج ممثلة من لوطات البذور وعدم تصديق تلك اللوطات التي يكون الفيروس فيها أعلى من الحد الحرج، والعزل الفراغي لإنتاج البذور بعيداً عن مصادر الفيروسات والضغط العالي للنقل، والاجتناب المؤقت للنواقل بما في ذلك القتل المبكر للعروش الخضرية المصابة والتحكم بالبيئة لخفض أعداد الناقل. ويمكن استعمال تغطية الخطوط لحماية الأجيال المبكرة من إكثار البذور. وزراعة شريط من المحصول بعرض 3م حول حقول الإكثار، كما أن الوصول إلى نمو متجانس ضمن الحقل يقلل من استعمار المنّ للمحصول. ويمكن باستخدام الزيوت الزراعية الحد من انتقال الفيروسات غير المثابرة كفيروس البطاطا Y، في حين أن استخدامات مبيد آفات على أطراف الحقل عند بدء عمليات الغزو قد تقلص كثيراً من استخدام المبيدات وتكلفتها، مع المحافظة على الأعداء الطبيعية.

مجال كوني، مهماً وأساسياً للتصدي للمشكلة عالمياً، ذلك أن الأمراض والآفات تجتاز الحدود ولا تعترف بها. وستتم مناقشة أهمية البحوث في هذا المجال في منطقة الشرق الأوسط، وعلاقة ذلك بتطوير سياسات فاعلة.

S 4

برنامج دعم التعاون البحثي كموديل للتنمية التقنية ونقلها في الدول العربية مع تركيز خاص على وقاية النباتات. أ.أ. هنريشس، قسم الحشرات، جامعة نيراسكا، لنكون، NE 68583-1816، الولايات المتحدة، البريد الإلكتروني: eheinric@vt.edu

يطور برنامج دعم التعاون البحثي في مجال مكافحة المتكاملة للآفات ويستخدم اتجاهات في مكافحة المتكاملة تسهم في رفع مستوى المعيشة وتحسن البيئة في الدول حول العالم. ويرتكز هذا البرنامج على (1) النهج التشاركي في مكافحة المتكاملة للآفات، (2) تأسيس شبكات الاتصال، (3) بناء القدرات/المؤسسات، (4) تطوير البحوث والتقني (5) نقل التقانات. وتتصدى البرامج الإقليمية في آسيا الوسطى وشرق أفريقيا، وغرب إفريقيا، وأمريكا اللاتينية/الكاريبي، وأوروبا الشرقية، وجنوب آسيا وجنوب شرق آسيا للمشكلات الخاصة بالمنطقة والمواضيع العالمية، كالأنواع الغازية، تقنية المعلومات وقواعد البيانات المختبرات الإقليمية للتشخيص، الفيروسات المنقولة بالحشرات، وتقديرات التأثير. وينصب معظم التركيز على محاصيل الخضار وثمار الفاكهة.

S 5

تطوير وتقييم مخاطر المحاصيل المحورة وراثياً. مايكل باوم ومجدي مذكور، المركز الدولي للبحوث الزراعية في المناطق الجافة، ص.ب. 5466، حلب، سورية، البريد الإلكتروني: m.baum@cgiar.org

يعمل المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا) على استغلال إمكانية استخدام الهندسة الوراثية للحصول على نباتات محسنة متحملة للفطريات أو مقاومة للجفاف وللإجهادات غير الحيوية الأخرى. بدأ العمل بتحويل الحمص والعدس بالتعاون مع جامعة هانوفر (بألمانيا)، كما بدأ بالعمل في تحويل الحبوب (النجليات) بالتعاون مع معهد البحوث الزراعية في الهندسة الوراثية (AGERI) ومركز التقانات الحيوية (CBS) في صفاقس بتونس. بمجرد الحصول على المنتجات الأولى لعملية التحويل الوراثي يجب أن يتم تقييم المخاطر وتحديد آلية أو استراتيجية محددة لإدارتها (لإدارة المخاطر). تتوضع دول الهلال الخصيب في مركز التنوع الوراثي للعديد من محاصيلنا الزراعية (الشعير، القمح، العدس والحمص) والتي تتميز أغلبها بأنها ذاتية الإخصاب وإن نسبة التلقيح الذاتي فيها منخفضة (من 0-2%). تجري دراسات لتحديد القيمة الدقيقة لتدفق المورثات وذلك بهدف تطوير العلم المعتمد على آلية تقييم المخاطر. تتطلب عملية نشر المحاصيل المحورة إلى مناطق خارج مركز نشوء التنوع الوراثي (مثل شمال أفريقيا وجنوب آسيا) اتباع استراتيجية مختلفة. لهذا السبب، يتم تشجيع ودعم خطة عمل للأمان الحيوي ولشروط الأمان الحيوي التي تسمح باختبار المحاصيل المحورة وراثياً في دول خارج منطقة مركز نشوء التنوع الوراثي.

S 6

الإدارة المتكاملة للآفات والزراعة العضوية. محمد السعيد صالح الزيميتي، قسم وقاية النبات، كلية الزراعة، جامعة عين شمس، ص.ب. 68، حدائق شبرا، 11241 القاهرة، مصر، البريد الإلكتروني: mselzemaity@hotmail.com

تزايد الاهتمام بالزراعة العضوية وزاد انتشارها في السنوات الأخيرة ليس على المستوى العالمي فحسب، بل على المستوى العربي أيضاً. وهي نظام للإنتاج تستخدم فيه العمليات أو المواد المعززة لحيوية التربة، لحياة وصحة النبات والحيوان، والمستهلكين والمزارعين أيضاً. وترتكز مبادئ الزراعة العضوية على إنتاج الغذاء بأسلوب مستدام لا تستخدم فيه الكيماويات سواء في مرحلة الإنتاج أو مابعد الحصاد. وتزايدت مبيعات المنتجات العضوية بصفة عامة وتزايد الطلب عليها بنسبة 20% في المتوسط منذ عام 1990. ويحكم إنتاج المحاصيل العضوية و مكافحة آفاتاتها مقاييس صارمة وقواعد يفرضها الاتحاد الدولي لحركات الزراعة العضوية IFOAM والقوانين الوطنية. ول سوء الحظ فإن تعزيز جودة التربة والعمليات الزراعية لا تكون دائماً فعالة لمكافحة الآفات في الزراعات العضوية، ولذا فإن الإدارة المتكاملة للآفات IPM تعتبر أساسية في هذا المجال حيث أنها توفر إلى مدى بعيد تقنيات وعمليات تجنب أو تقلل الضرر الناشئ عن الآفات لأقل حد ممكن بدون التضحية بجودة التربة، المياه، أو الكائنات النافعة. وبالتالي، فإن الـ IPM ليست فقط استراتيجية لإدارة الآفات، ولكنها إنتاج مستدام للمحاصيل مبني على التحليل والأسس البيئية. ومع ذلك، يعترض هذه التقنية بعض التحديات أو المعوقات التي ينبغي إدراكها، ومنها: (1) لاتزال الـ IPM غير مدركة أو مسلم بها بدرجة مناسبة كسياسة أو كحل لبعض المشاكل، كما أنها تحتاج لاهتمام أكبر على المستوى الشخصي وخاصة في الدول النامية؛ (2) يتطلب تنفيذ النظام جهداً وعملاً مكثفاً قد لا يتوافران على النطاق الواسع؛ (3) قد يواجه المزارعون في بعض السنين بأضرار للنبات وإنتاج أقل بصورة أكبر مما هو متوقع؛ (4) قد لا تتوفر طريقة أو مادة للمكافحة غير الكيماوية لبعض الآفات (الحشرية، العشبية، أو مسببات الأمراض)؛ و (5) محدودية

الحلقة العلمية الأولى: الأنواع الغازية من الآفات: تحديد هويتها وإمكانية المكافحة

S 1

اتفاقية وقاية النبات الدولية واستراتيجيات منع انتشار الأنواع الغريبة الغازية. جيفري جونز، ضابط زراعي في خدمة وقاية النبات، منظمة الأغذية والزراعة، روما، إيطاليا، البريد الإلكتروني: Jeffrey.jones@fao.org
تكون اتفاقية وقاية النبات الدولية (IPPC) رابطة شرعية لمعاهدة دولية حققت حديثاً التكمال ما بين 157 جهة موقعة. وتكون مهامها العمل الفعال الواسع لمنع انتشار ودخول آفات النباتات وآفات المنتجات النباتية، وتشجيع الاجراءات المناسبة لمكافحتها. ويكون مجال هذه الاتفاقية المحاصيل التجارية، وأيضاً تغطي الكائنات التي تهدد التنوع الحيوي والبيئة، ويمكن أن يتوسع عملها ليشمل النباتات غير المزروعة. وأدرجت الأنواع الغريبة الغازية (IAS) والكائنات الحية المحورة (LMOs) تحت اطار هذه الاتفاقية، واتسع المقياس الدولي لاتفاقية وقاية النبات الدولية بصورة واضحة لأجل قياسات الصحة النباتية (ISPMs) على تحليل مخاطر الآفات الذي هو عبارة عن اجراءات يمكن تطبيقها لتحديد أيها يكون ضرورياً لضمان استيراد النباتات والمنتجات النباتية وغيرها من السلع الخاضعة للمراقبة. يمكن التقليل من المخاطر التي قد تظهر نتيجة تداول أو الإدخال غير المقصود للعائد من الأنواع الغريبة الغازية (IAS) بفاعلية من خلال التعاون الدولي، وتبادل المعلومات وتطبيق خيارات الإدارة التقنية الصحيحة المستمدة من تحليل مخاطر الآفة المستهدفة. وتدعم الأجهزة الناطمة الوطنية بقوة بواسطة آليات إقليمية متخصصة مناسبة (منظمات وقاية النبات الإقليمية)، وتوفر المتطلبات الأساسية كاستراتيجية أوسع لمنع انتشار الأنواع الغريبة الغازية (IAS).

S 2

آفات النباتات المتغيرة الحدود، فرص جديدة لاستراتيجيات المكافحة المتكاملة للآفات من خلال شبكة اتصالات دولية. بيتر كينمور، رئيس ضابط المكافحة المتكاملة للآفات، خدمة وقاية النبات، منظمة الأغذية والزراعة، روما، إيطاليا، البريد الإلكتروني: Peter.kenmore@fao.org

لأكثر من ثلاثين عاماً كان اندلاع فوعات معظم الآفات الرئيسة للنباتات (الأمراض، الأعشاب والفقاريات) نتيجة تكثيف الإنتاج أو حركة الآفات العابرة للحدود. وقد وجهت أعداد كبيرة من برامج المكافحة المتكاملة للآفات ونفذت تجاه الكثير منها في بلدان عديدة بصورة فاقت الأعوام السابقة، وبخاصة تجاه الآفات العابرة الحدود. وخلقت تقانات المعلومات ولا سيما المعتمدة على الأنترنت إمكانية تطبيقية، وأسهمت في تعلم الدروس، وتحديد العوامل الحرجة وبالتالي إدارة وتقدير النتيجة البيئية للبرامج المتداولة. وقد حققت هذه البرامج نجاحاً في حماية الإنتاج المرتفع، وخفضت من أخطار المبيدات. وتعكس المعاهدات الدولية حول استخدام المبيدات والكائنات المدخلة كعوامل المكافحة الحيوية اجماعاً عالمياً متتامياً ولا سيما حول صحة الانسان وحماية البيئة بصورة أفضل. طورت التقانات الحديثة تطبيقات الدواء الانساني والحيواني، وأمكن تطبيقها بصورة أوسع على الآفات النباتية. وتمثل دراسة استراتيجيات المكافحة المتكاملة للآفات العابرة للحدود بما فيها خنافس أوراق جوز الهند في آسيا والمحيط الباسيفيكي، وصدأ فول الصويا في أفريقيا وآسيا وأمريكا الجنوبية وأمريكا الشمالية، وأمراض الذبول البكتيري للموز في أمريكا اللاتينية وأفريقيا وآسيا، ونشاطات الرز في آسيا أمثلة رائدة في التحديد المبكر، وطرائق مساهمة المزارعين، وتحليل النظام البيئي، وتقدير تأثير البرامج. وستكتشف فائدة هذه الخبرات تجاه الآفات العابرة للحدود في الشرق الأوسط وشمال أفريقيا، مثل: سوسة النخيل الحمراء وفيروس التريستيزا على الحمضيات/الموالح.

الحلقة العلمية الثانية: السياسة ومسائل تنمية في وقاية النبات

S 3

أهمية بحوث الأمان الحيوي للمحاصيل والأغذية في منطقة الشرق الأدنى. ماريا لودوفيك غولينو، مركز الكفاءة للإبداع في القطاع الزراعي البيئي، جامعة تورنتو، Via Leonardo da Vinci 44، 10095 Grugilasco، إيطاليا، البريد الإلكتروني: marialodovica.gullino@unito.it

تعد الزراعة والقطاعات المتصلة بها مهمة للاستقرار الاجتماعي، الاقتصادي والسياسي لأي بلد. وقد يؤدي الخلل في الأنشطة الزراعية إلى نتائج لقتصادية واسعة الانتشار في قطاع الغذاء والألياف. وفي أوروبا كما في العالم أيضاً، كرس معظم الانتباه لأحداث الإرهاب الحيوي التي تستهدف صحة الإنسان، وتم تأسيس لجنة عمل في المفوضية الأوروبية للإرهاب الحيوي. ولا تزال الأنشطة البحثية المنفذة في مجال الإرهاب الزراعي محدودة جداً، ويتوقع حصول زيادة كبيرة بالاهتمام. فمن ناحية يتوقع أن يزيد الاتحاد الأوروبي، من خلال برنامج إطار العمل السابع، وغيره من الهيئات أيضاً من استثماراتها في بحوث الأمان الحيوي. ومن ناحية أخرى يزداد عدد العلماء المهتمين بموضوع الأمان الحيوي المحصولي. ويعد التعاون، على

الحلقات العلمية

الحلقة العلمية الأولى: الأنواع الغازية من الآفات: تحديد هويتها وإمكانية المكافحة

الحلقة العلمية الثانية: السياسة ومسائل تنمية في وقاية النبات

الحلقة العلمية الثالثة: إدارة الآفات دون اللجوء لمبيدات الآفات الكيميائية المصنعة

الحلقة العلمية الرابعة: التشخيص الجزيئي لأنواع الآفات التي تصيب النباتات

رقم البحث	اسم الباحث	رقم البحث	اسم الباحث
E 56	التخلي، عادل اسماعيل	R 25	مكادي، محمد محيي الدين علي
R 14	النشوي، سنية محمد	V 38, V 37, V 36, S 14	مكوك، خالد
F 54, F 56, F 57, B 15, R 29	نشيط، ميلودي	V 46, V 45, V 44, V 41	
BC 57	النص، بهاء الدين	GT 5, V 47	
N 8	النظاري، صالح نعمان	GT 6	المكي، حياة
EX 18	النعمان، أدبية بونس شريف حمو	W 32	الملا، عبدا لله
F 39	النعيمي، ابتهاج حسين	R 11	الملاح، مزاحم قاسم
F 60, F 59	نعيمي، منذر	P 6	الملاح، نبيل مصطفى
C 2	النعيب، سالم قاسم	IPM 4, IPM 9	الملاح، نزار مصطفى
IPM 7	النمكي، ابراهيم حسن	RO 10	منتصر، سيد عبد العزيز
N 4	نور الدين، أحمد حماد	NE 21, BC 25	منجود، أشرف عبد السلام هندي
F 4	نور، سعاد	V 1, V 41	متنو، محمد جميل
W 9	نور محمد، قريبن	P 15	منصور، ريتا
E 48, F 74	نيان، عبد العزيز	V 53	منصور، عتق
F 43	نيدارزاده، ن.	F 21	منصور، محمود توفيق محمود
F 2	نيكول، م.	EX 1	المنصور، ناصر
V 17	هاشم، أحمد	C 16	المنصوري، مبارك علي القصيلي
W 26	هاشم، سايما	R 31	المنوفي، عادل
C 8	هاشم، عبد الكريم	EX 28	متيعم، أمل حامد
E 52	الهاشمي، روضة	IPM 5, E 29	مهدي، حسن سليمان
E 32	هاشمينا، سيده م.	EX 22, BC 54	مهدي، عبده مهدي محمد
R 9	هالاما، باتريس	V 21	مهنا، أحمد محمد
W 22, W 7	هاتي، مريم	IPM 5	مهيوب، محمد
BC 21	هيبس، محمد بن مسلم علي	M 3, M 4	مرافي، مصطفى حلمي
GT 1	هلالي، حميدة	W 40	مرحاسيل، محمد رشيد
B 18	هلالي، محمد أمير	BC 20	مور، نيفد
BC 4, BC 6	همام، جمال همام عبد المليم	P 25	موسوي، خديجة مريم
E 36, C 6, P 18	همام، همام بخيت	BC 53	موسى، نبال خليل
NE 13	هميض، ناجي جابر	F 8	موصلي، محمد نذير
S 4	هنريش، أ.أ.	R 12	مولي الدويله، يحيى عبد الله
NE 4	الهندي، أحمد	F 13	المومني، أحمد محمد
V 33, V 57	الهيبي، اياد عبد الواحد	BC 39	مونير، ربيعة
M 7	هيكل، ابراهيم حسن	GT 10	مبخائيل، فاني نكي عازر
IPM 10	ودجيني، ج.	BC 59	مبخائيل، موريين صبري
F 21	الوكيل، عبد الفتاح عبد الحميد	F 70	ميرابولفاتهي، م.
RO 1, RO 6	ولسن، مجدي	BC 55	ميرات، افساني
R 17	وهبه، جرجس	V 1, V 5	ميرتا، أرين
S 12	وولر، سيمون	GT 3, GT 4	ميرزا، فاطمة
V 30	يازارلو، أ.	F 42	ميرلوهي، أ.ف.
F 20	الياسري، اسماعيل ابراهيم	V 6	ميلن، روبرت
P 11	ياقتي، رضوان	EX 6, EX 7, EX 8	ميلهورن، هانز
F 54, B 18	بيرق، محمد موفق	F 67	ميلود، بلحسن
F 56, F 59, F 60, R 10, GT 1	يحيوي، عمر	N 5	الناجح، يوسف علي
W 3	يحيى، زكريا رفاعي	V 18	ناشر، عبد الله
N 8	اليحيى، فهد عبد الله	V 56, P 21	ناصر، توفيق
NE 12	اليهري، عادل	IPM 16	ناصر، زياد
P 4, P 20, F 53, F 61, W 11	يوسف، حلیم	BI 5	الناظر، ابراهيم
V 10, V 26	يوسف، سحر عبد العزيز	V 31	ناغيازاد، مريم
P 4, P 20, F 53, F 61, W 11	يوسف، عمران	P 4, N 13	الناقوح، عبد الرزاق
BC 33, N 2	يوسف، محمود محمد أحمد	P 23	النبراوي، ابراهيم متولي
F 28, NE 34	يونس، غيداء	B 4	نيهان، شذا
R 14	يونس، همام الدين حنيش	V 45	نجار، أسماء
F 49	يونس، ح.	BC 43	اننجار، محمد عبد العزيز
R 5	يونغ، كريستيان	BC 33	اننجدي، وفاء محمد عبد الحميد
		F 8, F 61, F 53	نحلاوي، عدنان

رقم البحث	اسم الباحث	رقم البحث	اسم الباحث
GT 9	المحمد، حسين غضبان	B 10	كريمي، زليخة
E 56	محمد، حميد حسين	BC 18	كسلر، فيليب
RO 1	محمد، حواء	R 20, R 18	الكسمي، منى
E 46	محمد، خديجة سليمان	E 42	كعكة، نوال
M 6	محمد، رضا عبد الجليل	R 2	لكمر، ماجد خليف
E 39	محمد، سندس عبد التواب	RO 8	كوجه باغي، أمير حسين
BI 3	محمد، عبد السلام أنور	F 24	الكوراني، رمضان يوسف
W 14	المحمد، علي فدم	E 48	كورنوشور، سربيل
GT 11	محمد، لبيوض	GT 8	كوفمان، سيرج
C 27	محمد، ليث عادل	B 15	كيلي، ميادة
BC 59	محمد، ماجي السيد	F 30	كيان، سفورا بنمحمد
N 23	محمد، معروض محمد محمد	W 33	كيشفازي، م.
C 6	محمد، منى عبد الحميد	F 30	كينزويل، لورا
F 70, F 69	محمد، أ.	S 2	كينمور، بيتر
EX 31	المحمد، عمر هاشم مصلح	E 57	كوبهناين، أ.أ.
W 5	محمد، غ. نور	BC 61, IPM 20	لادلشمي، د.
N 24	محمد، م.	GT 11	لاميس، لوس
V 51	محمود، صبري بونس محمد	V 21	لانكن، كريكور
NE 33, P 14, E 27, BI 2	محمود، طلال طاهر	E 13, E 15, NE 10	لبايبدي، محمود صبري
NE 9		F 67	لخضر، بلعبيد
RO 2	محمود، غياث صالح	F 4	لشكر، خديجة
NE 20	محمود، محمد النذير الفاضل	IPM 14, IPM 17	الشمي، نجوى شبر
BC 23, E 5	محمود، محمود فرج	F 68	لمبدي، محمد
RO 4	مختار، زينب	E 3	لمعاري، مالك
V 17	مختار، سناء	W 10	لفته، مزر
S 5	منكور، مجدي	BI 7, BI 6	لوادي، كمال
IPM 8	المنبوت، جودة	EX 10	لواني، غزالة
F 71, R 6, R 4	مراد، سامر	DL 4	لوفو، ألان
F 11, BC 36	المراد، نضال يونس	DL 6	لوتق واسكوفماند، ميهان
BC 5	المراغي، سعد شحاتة محمد	V 6	لويزوني، أنريكو
EX 14	مزرقات، أ.	BC 34	الليثي، بهاء الكردي أحمد
F 3, BC 45	مزعاش، سامية	DL 6	لوكونك، ميشيل
V 27	مزيد، حامد محمود	EX 20	ماجد، أ.
P 3	مساعدة، سمير	V 9	مارتلي، جوفاني بارلو
IPM 16, GT 2	مسلم، زكريا	E 34	مارتن، جون
V 11	مسلمانية، نريا	V 13	مارتيلي، جي. بي.
W 10	المشيداني، شوكت عبد الله	V 11	مارتيلي، جوفاني
E 16	المنبيخي، يوسف	F 22	مارتينيز، ايف
F 53, F 61	المصري، صفية	E 43, NE 12	مارديني، خالد
NE 32, V 56, N 26, P 21	مصري، ماهر	W 1, W 2, W 26, W 37	ماروات، خان باحدار
N 3, N 6	المصري، ميمونة	F 73	مالهوترا، راجندر
IPM 16	مصطفى، درويش	RO 3, RO 5	مام خير، إبراهيم
IPM 9	مصطفى، شاهين عيسى	B 17	مانسفيلد، جون
BI 4	مصطفى، عمر عبد الرحيم	F 19	مانع، علاء عودة
NE 1	مصطفى، منى	V 22	مايز، ادغر
EX 5	مصطفى، منيف عبد	P 11	مايستر، كريستيان بورجه
B 3	مطر، هناء عبد الفتاح سالم	BC 13	مباركي، عبد الكريم
R 17	مطرو، لينا	R 27	المبروك، عبد الحميد حسن
V 3, V 15	المعاضدي، منى عكيدي	NE 29, W 19, E 2, E 1	المتي، وائل
F 60	معراوي، نجلاء	V 48	مجاهد، خالدية
P 1	المعروف، عماد	F 12, F 46	مجد، أ.
W 15	معطوي، عبد الواحد	R 22	المحجوب، علي
NE 31, E 41	المعلم، رسمية	P 2	محرز، براءة
EX 32, W 41, W 24	المعمار، أنور	V 44	محرم، إسماعيل
F 52	معروف، مفتاح محمد	BC 23, E 5	محمد عثمان، محمد عبد النعيم
N 24, F 44	مغلام، أ. مهدي خان	IPM 9	محمد علي، جبهة لدرين
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منظمة الأغذية والزراعة للأمم المتحدة (الفاو)، المكتب الإقليمي للشرق الأدنى، مصر



المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، حلب، سورية



الهيئة العامة للتقانة الحيوية، دمشق، سورية

شركة المواد الزراعية (مقدادي)، دمشق، سورية



شركة سليمان الزراعية، اللاذقية، سورية



شركة Andermatt BIOCONTROL AG، 6 Stahlermatten، 6146 Grossdietwil، سويسرا



دبابة أخوان ش م ل، دمشق، سورية



شركة نستله، دمشق، سورية



الهيئة الإدارية للجمعية العربية لوقاية النبات

الأردن	الرئيس	عقل منصور
لبنان	نائب الرئيس	وفاء خوري
لبنان	أمين السر والصندوق	ليندا كفوري
سورية	عضو - رئيس لجنة المطبوعات والنشر	صفاء قمري
ليبيا	عضو - رئيس لجنة التعريب	ابراهيم الغرياني
المملكة العربية السعودية	عضو - رئيس لجنة العضوية والاعلام	ابراهيم الشهوان
سورية	عضو - رئيس لجنة الشرف والجوائز	محمد نايف السلتي
سورية	عضو - رئيس اللجنة المنظمة للمؤتمر العربي التاسع لعلوم وقاية النبات	مجد جمال
لبنان	رئيس تحرير مجلة وقاية النبات العربية	خالد مكوك

اللجنة العلمية للمؤتمر العربي التاسع لعلوم وقاية النبات

أحمد كاتبة، كلية الزراعة، الجامعة الأردنية، الأردن	الحشرات الاقتصادية
حمزة بلال، كلية الزراعة، جامعة دمشق، سورية	
خالد الرويشدي، منظمة الأغذية والزراعة للأمم المتحدة (الفاو)، تونس	
محمد أحمد، كلية الزراعة، جامعة تشرين، سورية	
محمد نايف السلتي، كلية الزراعة، جامعة حلب، سورية	
نبيل أبو كف، كلية الزراعة، جامعة تشرين، سورية	
وجيه قسيس، كلية الزراعة، جامعة دمشق، سورية	
مجد جمال، الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	حلم/أكاروسات
محمود صبري لبايدي، كلية الزراعة، جامعة حلب، سورية	
منذر حلوم، كلية الزراعة، جامعة تشرين، سورية	
أحمد الأحمد، ايكاردا، حلب، سورية	أمراض فطرية وبكتيرية
بسام بياعة، ايكاردا، حلب، سورية	
صلاح الشعبي، الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	
فواز العظمة، الهيئة العامة للتقانة الحيوية، دمشق، سورية	
محمود أبو غرة، كلية الزراعة، جامعة دمشق، سورية	
نبيل البيك، الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	
خالد مكوك، ايكاردا، القاهرة، مصر	أمراض فيروسية
صفاء قمري، ايكاردا، حلب، سورية	
عماد اسماعيل، كلية الزراعة، جامعة تشرين، سورية	
أحمد عبد السميع دواية، جامعة الملك سعود، الرياض، السعودية	نيماتودا
خالد العسس، كلية الزراعة، جامعة دمشق، سورية	
وليد أبو غربية، كلية الزراعة، الجامعة الأردنية، الأردن	
أنور المعمار، كلية الزراعة، جامعة دمشق، سورية	أعشاب
بركات أبو رميلة، كلية الزراعة، الجامعة الأردنية، الأردن	
سمير طباش، كلية الزراعة، جامعة تشرين، سورية	
اسكندر عجان، كلية الزراعة، جامعة تشرين، سورية	مبيدات الآفات الكيماوية
جمال الحجار، كلية الزراعة، جامعة دمشق، سورية	
فوزي سمارة، كلية الزراعة، جامعة دمشق، سورية	
محمد السعيد الزميتي، كلية الزراعة، جامعة عين شمس، القاهرة، مصر	
محمد الطويل، كلية الزراعة، جامعة تشرين، سورية	
أحمد زياد الأحمد، كلية الزراعة، جامعة دمشق، سورية	قوارض وأفات أخرى
عدوان شهاب، الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	
علي البراقي، كلية الزراعة، جامعة دمشق، سورية	حشرات نافعة

اللجنة المنظمة للمؤتمر العربي التاسع لعلوم وقاية النبات

الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	رئيساً	مجد جمال
الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	أمين السر	صلاح الشعبي
الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	عضو	نبيل البيك
الهيئة العامة للتقانة الحيوية، دمشق، سورية	عضو	فواز العظمة
المركز الدولي للبحوث الزراعية في المناطق الجافة (إيكاردا)، حلب، سورية	عضو	صفاء قمري
كلية الزراعة، جامعة دمشق، دمشق، سورية	عضو	حمزة بلال
الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	عضو	جمال مندو
الهيئة العامة للبحوث العلمية الزراعية، دوما، دمشق، سورية	عضو	عادل المنوفي

قمرى، صفاء، خالد مكوك، صلاح الشعبى وأحمد الأحمد. 2006. المؤتمر العربى التاسع لعلوم وقاية النبات، قصر المؤتمرات، دمشق، سورية، 19-23 تشرين الثانى/نوفمبر، 2006. 251 صفحة (عربى) و 247 صفحة (انكليزى). الجمعية العربىة لوقاية النبات، بيروت، لبنان.

صفاء قمرى، المركز الدولى للبحوث الزراعىة فى المناطق الجافة (اىكاردا)، ص.ب. 5466، حلب، سورىة
خالد مكوك، المركز الدولى للبحوث الزراعىة فى المناطق الجافة (اىكاردا)، ص.ب. 2416، القاهرة، مصر
صلاح الشعبى، الهيئة العامة للبحوث العلمىة الزراعىة، دوما، ص.ب. 113، دمشق، سورىة
أحمد الأحمد، المركز الدولى للبحوث الزراعىة فى المناطق الجافة (اىكاردا)، ص.ب. 5466، حلب، سورىة

الجمعية العربىة لوقاية النبات

ص.ب. 6057-113، بيروت، لبنان

البريد الالىكترونى: aspp@terra.net.lb

الصفحة الالىكترونىة: www.asplantprotection.org

الهيئة العامة للبحوث العلمىة الزراعىة

دوما، ص.ب. 113، دمشق، سورىة

طباعة واخراج: صفاء قمرى ونوران عطار

حقوق الطبع محفوظة

ملخصات البحوث

المؤتمر العربي التاسع لعلوم وقاية النبات



تنظيم

الجمعية العربية لوقاية النبات

بالتعاون مع

الهيئة العامة للبحوث العلمية الزراعية، سورية

19-23 تشرين الثاني/نوفمبر 2006

قصر المؤتمرات، دمشق، سورية

إعداد

صفاء قمري، خالد مكوك، صلاح الشعبي وأحمد الأحمد

تحت رعاية السيد رئيس مجلس الوزراء في الجمهورية العربية السورية



كتاب ملخصات البحوث

المؤتمر العربي التاسع لعلوم وقاية النبات

19-23 تشرين الثاني/نوفمبر 2006

قصر المؤتمرات، دمشق، سورية

إعداد

صفاء قمري، خالد مكوك، صلاح الشعبي وأحمد الأحمد

تحت رعاية السيد رئيس مجلس الوزراء
في الجمهورية العربية السورية

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الهيئة العامة للبحوث العلمية الزراعية

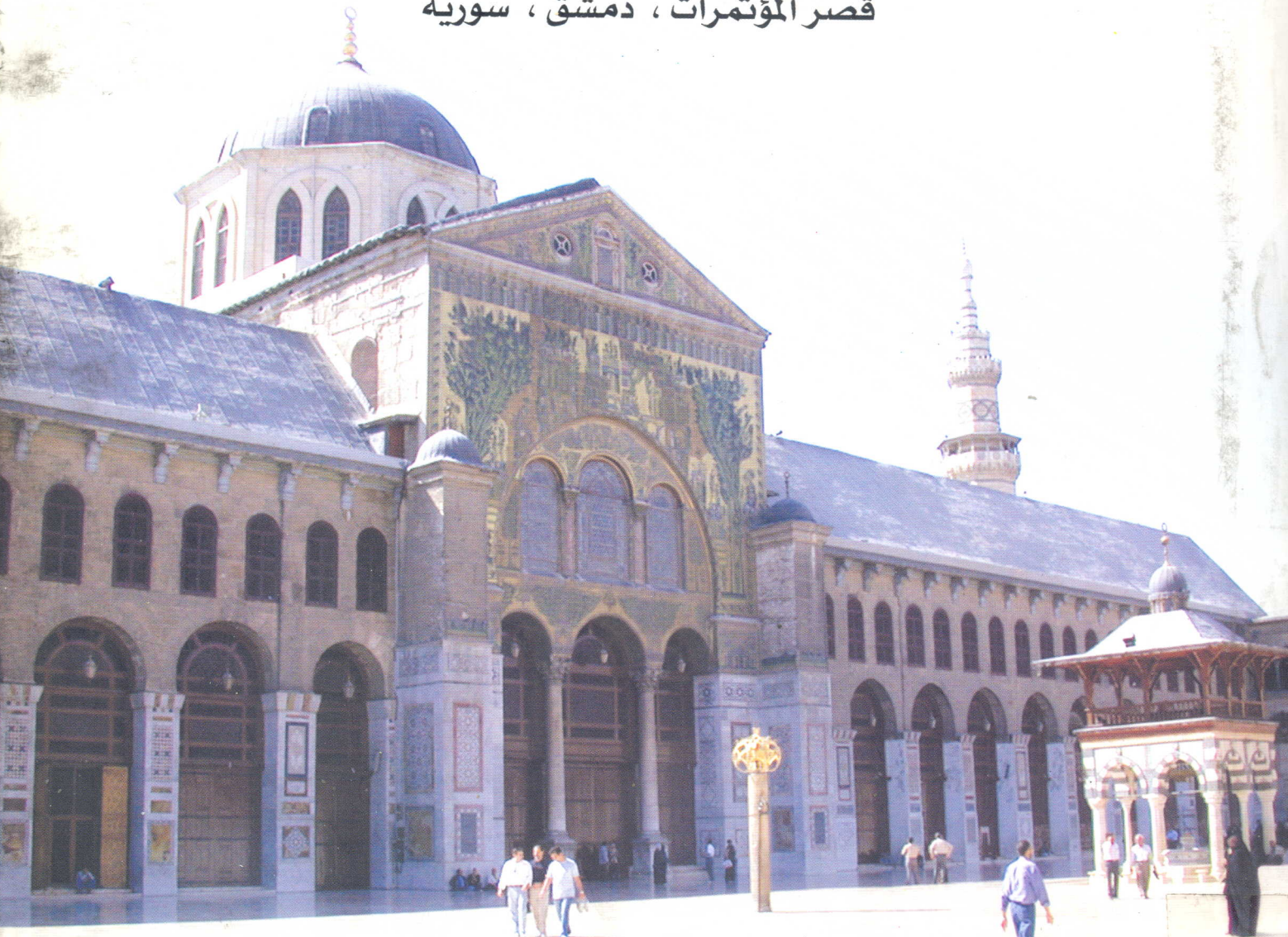


كتاب ملخصات البحوث

المؤتمر العربي التاسع لعلوم وقاية النبات

19 - 23 تشرين الثاني/نوفمبر 2006

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تنظيم

الجمعية العربية لوقاية النبات

والهيئة العامة للبحوث العلمية الزراعية، سورية