# ICARDA IN NEWS

# 1983-84

International Center for Agricultural Research in the Dry Areas
ICARDA
P. O. Box 5466, Aleppo, Syria

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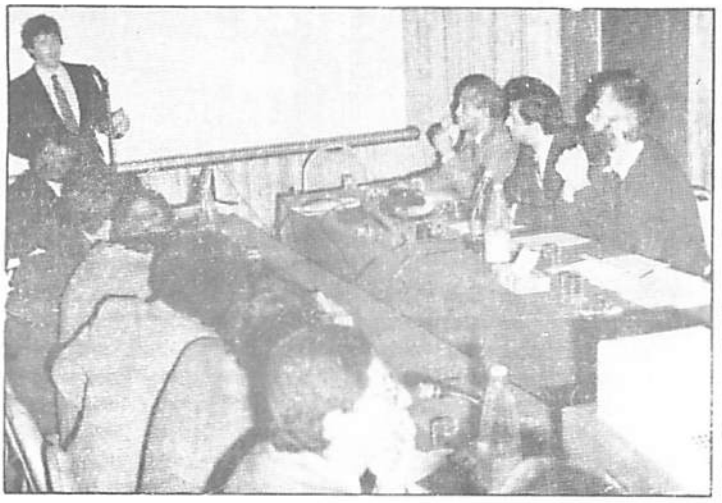

# Seminar on agricultural research in dry areas

DAMASCUS, (SANA) — Meetings of the second Regional Scientific Seminar on Agricultural Research, which is organized by the International Centre of Agricultural Research in Dry Areas (ICARDA), was opened on Sunday at the Cham Hotel.

The opening ceremony was attended by the Director General of ICARDA, Dr. Mohammad Abdulla Nour, the Director of the Desert Department, Mr. Hazem al-Samman, Director of the Crops Section at the Ministry of Agriculture, Mr. Fuad Kardous, experts from the Arab Centre for Studies on Dry Areas and Arid Zones, lecturers representing Syria, Tunisia, Morocco, Jordan, Turkey, the Sudan and the Democratic Republic of Yemen.

Director of the ICARDA's Agricultural Research Programme, Dr. Peter Copper made a speech in which he welcomed participants, explaining that this seminar is an important stage on the way to achieve integration among agriculture and livestock production systems, particularly the production of barley and fodders in arid areas.

Dr. Copper added that the ICARDA has studied dry areas for several past years and that there is a joint project between the Ministry of Agriculture and ICARDA to study the possibility of increasing barley production through the use of phosphate fertilizers.

Agricultural Economic Researcher, Dr. Ronald Jopier at the ICARDA talked about the arid areas in Syria, stressing that the notable expansion of barley cultivation in Syria is due to the use of agricultural mechanization. Dr Jopier called for increasing work and improving productivity in arid areas.

The Land Expert at the ICARDA, Dr Abdulla Matar, and Professor of Agricultural Economy at Tishreen University, Dr. Yousef Ammar read a joint research paper, in which they explained the factors affecting barley productivity in Syria after they had made a four-year study of the areas extending from the Syria coast to the Syrian desert (al-Badia).

In the light of the study, both researchers stressed that phosphate fertilizing is an important factor that helps increase production of barley.

Fighting weeds helps barley cultivation, they pointed out. The Seminar, which will last for two days, will continue its work today.

WORLD BANK NEWS

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## Notes and Quotes

**WORLD FOOD FORECAST.** At the annual meeting of the Consultative Group on International Agricultural Research (CGIAR) in Washington, November 5-9, World Bank Radio asked participants for a forecast of the world food situation at the turn of the century.

**Dr. Mohammed Nour, International Center for Agricultural Research in the Dry Areas (ICARDA), Beirut, Lebanon, and Aleppo, Syria.** The pessimists tell us that the world will be crawling with human beings and that the explosion in population is going to create more famines and more disasters. I do not subscribe to that. What I see is a levelling off of population growth...ICARDA increasingly joining hands with the national networks within the region, and also outside it, in order to increase the productivity of the land. I am very optimistic that the international agricultural research centers will become increasingly involved in the growth and consolidation of the gross national product in the agricultural field, and particularly in the basic food crops in countries of [the Middle East] and North Africa. This applies also to other countries of the Third World...I would consider that the year 2000 will dawn on us with more promise and more self-reliance as far as food is concerned.

# Taming orobanche

**ICARDA science writer Lynn Simarski charts a programme of refining plant control methods to curb a parasitic menace to Mediterranean crops**

DURING the growing season in the Mediterranean region, showy spikes of white flowers crowd the crops in many farmers' fields. The beautiful flowers are actually a weed called *Orobanche* (or Broomrape) — a serious parasite on legumes and other crop plants in the area.

"An infestation can wipe out an entire field of faba beans, given the right conditions," explains agronomist Dr Mohan Saxena, who heads the food legume improvement programme of the International Center for Agricultural Research in the Dry Areas (ICARDA), based at Aleppo, Syria.

ICARDA's mandate — to help improve food supply in North Africa and the Middle East — encompasses combating agricultural pests such as *Orobanche*. The weed attacks legumes such as faba bean, lentil, peas, and chickpea, as well as tomatoes, sunflowers, tobacco, and other crop plants in the region.

It probably does the worst economic damage to faba bean, says Saxena. Since the weed cannot survive without parasitising a host plant, it has probably plagued faba bean farmers since the crop originated. In fact it germinates only when stimulated by an excretion from a host plant's roots. The weed's roots, in turn, produce an outgrowth that penetrates the roots of the host and saps the crop's vigour.

Several traits of *Orobanche* make chemical eradication almost impossible. Its seeds — extremely tiny and almost weightless — are easily dispersed by wind. Once embedded in soil, dormant seeds can survive for more than 10 years. An infestation must be treated repeatedly, because only about one-tenth of a field's seeds germinate in a given year.

Farmers in North Africa and West Asia have evolved natural ways to fight this parasite. Syrian growers, for instance, plant lentils about a month after the growing season starts, so the weed does not have time to germinate. Other farmers reduce infestation by including a cereal crop — immune to *Orobanche* — between two faba bean crops. Some West Asian and Egyptian

*An Egyptian farmer in a faba bean field infested with orobanche*

farmers plant onion, garlic, or coriander between susceptible crops to prevent weed build-up.

ICARDA is refining these time-honoured methods and developing modern controls, explains Dr Saxena. The Center's weed scientists have worked with the American University of Beirut on a way to stimulate *Orobanche* germination without the host crop. When soil is sprayed with artificial root exudates, the weed emerges and dies because it has no crop to feed on. Wide use of the chemical is still prohibitively expensive, however.

Another new technique is to spray select herbicides such as glyphosphate several times on the crop at sub-lethal doses, so that the weed accumulates the poison as it attacks the host. "It looks as if *Orobanche* cannot break down the herbicide the way the host can," Saxena explains.

ICARDA has also sought naturally-resistant legume genotypes, or groups of plants with a certain genetic make-up, in countries where the weed is a problem. Three years of research have identified 14 lines of faba bean, more than a dozen lines of lentil, and 32 chickpea lines that either tolerate or are resistant to *Orobanche*.

The next step is breed resistance into genotypes already adapted to local environments around the region. "For example," Saxena explains, "a resistant variety from Morocco may not yield well under the abundant rainfall of the Syrian coast." ICARDA has sent resistant lines to breeders all over the region for evaluation and eventual incorporation into local crops.

Egyptian researchers have pioneered the way in releasing a faba bean cultivar for Egypt called 'Giza 402,' which produces high yields even in the presence of Orobanche. "The genotype will be distributed to Egyptian farmers because it's proven more resistant than any other line'" says Saxena. How 'Giza 402' resists the weed is still unclear, he says. The variety's large root mass may enable enough nutrition to reach the plant even with parasitism. The line could also have tougher cell walls that the parasite cannot penetrate.

*Orobanche* is so entrenched in the Mediterranean area that control rather than complete obliteration is the goal. Research on minimising the economic damage of this and other parasitic weeds was explored at a conference held at ICARDA earlier this year.

Middle East Agribusiness Vol. 4 No. 9 Oct 1984

# Forage production in intensive agriculture

Fahrettin Tosun, Dean, Faculty of Agriculture, Samsun, Turkey

Forages form the basis of every dairy cattle feeding program. Pasture, hay and silage are cheaper sources of nutrients than concentrates.

A pilot dairy improvement project is in progress in Turkey, based on improved forage production.

About 62 per cent of the total milk in Turkey is obtained from cows. The average milk yields of cows in Turkey (581 kg per cow) is very low as compared to the milk yield of developed countries.

In the project area, grasslands (pastures and meadows) are very limited covering only 6 per cent of the total area. Due to the high animal density in this area, the vegetation of pasture lands has been badly depleted. Therefore, reseeding of these grazing lands can markedly increase the forage production. In Erzurum, Turkey, a twofold increase in hay yield has been obtained by reseeding natural grazing land with a mixture of alfalfa and sainfoin with perennial grasses.

Another requirement of increasing the forage production of grazing lands is to develop a good irrigation and fertilization program. Hay yield of native meadows in Erzurum was 2 tonnes per hectare whereas the largest yield (5.7 t/ha) was obtained when 150 kgs of nitrogen, 120 kgs of phosphorus pentoxide and 150 kgs of potassium oxide per hectare were applied.

As in most dairy regions, the green chop from these pastures is a major feed source for at least five months of the year. This grazing period can be extended by grazing meadow aftermath during the mid-summer and a mixture of small grains with vetches during early spring and late autumn.

Fodder crops grown in the cropping area take the place of green chop during the nonpasture season, and they are also used to supplement deficient pasturage in season. The acreage of fodder crops in the project area, covering only 0.8 per cent of cultivated land, is very limited. Therefore, the acreage of fodder crops — namely annual legumes and cereals, alfalfa, sainfoin Gelemen Clover and some perennial grasses — will be increased in cropping land. The mixtures of annual legumes (*Vicia, Pisum* and *Lathyrus)* with annual forage cereals (barley, oats and triticale) are planted in the autumn and harvested early the next spring for hay production and/or for silage. Then these are followed by a summer crop such as corn, tobacco or soybean. Thus a double cropping in one year from the same field is possible. (A dry matter of about 8 tons per hectare was obtained from the mixture of *Vicia-Oats* when seeded 180 kg/ha and fertilised 80 kgs of phosphorus pentoxide per hectare in Syria [ICARDA, 1982].

Alfalfa and sainfoin can be grown as a pure stand and/or mixture with perennial grasses in crop rotation. In either case, in order to produce high forage production they should be irrigated and fertilized. The effect of nitrogen upon the hay yield of grasses is more pronounced than other elements. In addition, the application of nitrogen increased the percentage of crude protein of bromgrass from 10.4 to 13.6 per cent under irrigation.

The total digestible nutrient (TDN) value of forage is associated with several factors; the growth stage of the plant is the most important. The ratio of crude protein and digestible dry matter decreased while the ratio of crude fibre increased as the growth stage was delayed in alfalfa and sainfoin.

Sainfoin, being a perennial legume, has some advantages and disadvantages over alfalfa. The hay yield of alfalfa is higher than sainfoin but sainfoin is not known to cause bloat in animals even if it is grazed in the immature stage.

Because of the high rainfall and humidity in the region silage making from grass, corn and sorghum is a further possibility.

# Pflanzenzüchtung für den Nahen Osten

## Forschungszentrum in Syrien — Probleme durch Trockenheit und Kälte

Tagesspiegel, Berlin 13/10/84

Das größte Problem der Bauern im Nahen Osten ist das Klima. Getreide und Früchte sind extremen Temperaturschwankungen ausgesetzt, heiße Tage wechseln ab mit kalten Nächten. Minusgrade sind keine Seltenheit. Mit jährlichen Niederschlägen zwischen 800 und 200 Millimetern und teilweise auch darunter gehört der Nahe Osten, wie übrigens auch das nördliche Afrika und Teile der Türkei bis hin nach Pakistan, zu den Trockengebieten der Erde. Aber nicht nur, daß wenig Regen fällt, er beginnt in manchen Jahren auch viel zu spät, was verheerende Folgen für die Ernte hat.

Auch Schädlinge und Krankheiten können die Ernte zerstören. Das kann soweit gehen, daß Mehl von gesundem Weizen ein bis zu fünffach größeres Brot ergibt, als die gleiche Menge Mehl von kranken Ähren.

Diese Probleme könnten neue Pflanzensorten lindern, die widerstandsfähig gegen Trockenheit, starke Temperaturschwankungen und Schädlinge sind. Die Züchtung derartiger Pflanzen gehört daher zu den Hauptaufgaben des Internationalen Zentrums für landwirtschaftliche Forschung in Trockengebieten (ICARDA) im Norden Syriens. Auf einer kleinen Anhöhe unweit der Stadt Aleppo liegen die Institutsgebäude und Versuchsfelder des Zentrums — das Gelände wurde von der Regierung in Damaskus zur Verfügung gestellt.

### Im Jahr 1977 gegründet

Erst 1977 gegründet, ist ICARDA eines der jüngsten internationalen Forschungszentren, die sich speziell mit der Landwirtschaft in Entwicklungsländern beschäftigen. Schwesterinstitute sind beispielsweise das Internationale Reisinstitut auf den Philippinen, das Kartoffelinstitut in Peru oder IITA in Nigeria, das für die Landwirtschaft in den Feuchttropen zuständig ist.

Auf der ganzen Welt gibt es bisher zehn Forschungszentren dieser Art. Finanziert werden sie von internationalen Organisationen wie der Weltbank oder der OPEC und von zahlreichen Regierungen westlicher Länder. So beteiligt sich die Bundesregierung mit jährlich rund drei Millionen DM am Haushalt von ICARDA. Sie ist damit nach den USA der größte Geldgeber dieses Instituts. In den ersten Jahren hatte ICARDA erhebliche Schwierigkeiten. Die politische Lage im Nahen Osten war sicher ein Grund. Inzwischen jedoch erhält der Besucher den Eindruck, daß die Arbeiten in vollem Gange sind.

### Versuchsfelder mit Hartweizen

Auf den Feldern des Instituts wächst Weizen, vor allem Hartweizen, aus dem hier das dünne Fladenbrot gebacken wird. Es ist auffällig, daß auf den Versuchsfeldern das Getreide viel dichter und höher steht als bei den Bauern. Tatsächlich selektiert und testet ICARDA Sorten mit besonders hoher Resistenz gegenüber Trockenheit und Kälte. Vor allem aber wollen die Wissenschaftler mehr Sorten entwickeln, die sich den Gegebenheiten verschiedener Regionen besser anpassen. So sind in dem trockenen Hochland von Pakistan andere landwirtschaftliche Bedingungen zu berücksichtigen als in Libanon oder in Marokko. In all diesen Ländern aber gehört Hartweizen zu den wichtigsten Nahrungsmitteln, und der Bedarf an höherwertigem Saatgut ist daher groß.

Resistenzzüchtung gegenüber Schädlingen ist ein weiteres Ziel von ICARDA. Und die Ergebnisse? Ein Ende der Suche nach der idealen Weizensorte wird es wahrscheinlich nicht geben. Aber Fortschritte sind sichtbar.

Nicht nur beim Weizen wurden Erfolge erzielt, auch bei Gerste, die als Futtermittel unverzichtbar ist; denn ein Bauer im Nahen Osten oder in Nordafrika ohne stattliche Schafherde ist undenkbar. Da bisher die Bauern in der Region in der Hauptsache Nomaden waren und ihre Tiere überall weiden ließen, ist es verständlich, daß sie nun mit zunehmender Seßhaftigkeit vermehrt Futter anbauen müssen.

### Hülsenfrüchte als Fleischersatz

Eine große Rolle in der Ernährung der Menschen dieser trocken-heißen Gebiete spielen Linsen, Kichererbsen und schwarze Ackerbohnen. Sie enthalten hochwertiges Eiweiß und sind daher vollwertiger Ersatz für teures Fleisch. Doch um die Qualität der in der Region vorhandenen Sorten ist es nicht zum Besten bestellt. Krankheiten, Schädlinge und parasitische Blütenpflanzen, aber auch Trockenheit und Kälte machen den Bauern zu schaffen. Bei Kichererbsen kann das Institut nun einen Erfolg verzeichnen: Seit kurzem werden in einigen Gegenden Syriens, Jordaniens und des Libanons Erbsensorten angebaut, die bereits im Winter ausgesät werden können. Der erste Frühjahrsregen kommt dann den jungen Pflanzen zugute.

Hülsenfrüchte haben noch einen anderen Vorteil: Sie binden Stickstoff und erhöhen dadurch die Bodenqualität. Dies zeigt sich deutlich, wenn auf einem Feld, auf dem in einem Jahr Hülsenfrüchte angebaut werden, in der nächsten Saison Getreide gepflanzt wird. Die Ergebnisse sind besser als auf Feldern ohne Fruchtwechsel. Was das für den einzelnen Bauern bedeuten kann, wird klar, wenn man bedenkt, daß stickstoffhaltiger Kunstdünger besonders teuer ist.

### Probleme durch Bürokratismus

Zugegeben: der direkte Kontakt zu den Bauern ist nicht immer gegeben. So darf das Institut neues Saatgut nicht direkt an den einzelnen Landwirt abgeben. Die Verteilung erfolgt vielmehr in allen betroffenen Ländern über das Landwirtschaftsministerium. Und das klappt nicht immer: Bürokratismus, Besserwisserei, Transportschwierigkeiten, Kompetenzstreitigkeiten können den Weg einer neuen, vielleicht besseren Sorte vom Labor zum Bauern verstellen. Andererseits finden viele Versuche mit Bauern direkt statt; zum Beispiel testen Bauern des Niltales in Ägypten und Sudan traditionellen und modernisierten Anbau von schwarzen Bohnen. Was sich als erfolgreicher erweist, können sie mit eigenen Augen sehen.

Ist also der oft gehörte Vorwurf berechtigt, daß die Wissenschaftler in einem Elfenbeinturm sitzen ohne Kontakt zur Wirklichkeit draußen? Nun, sicher wird es immer wieder Forschungsergebnisse ohne sichtbaren praktischen Bezug geben, andere aber können eine Hilfe, vielleicht gar einen Durchbruch bedeuten und damit auch dem einfachen Bauern von Nutzen sein. Gerade in Instituten wie ICARDA, die für Entwicklungsländer tätig sind, werden nicht mehr unbedingt nur Sorten gezüchtet, die einen hohen Einsatz an chemischem Dünger oder Pflanzenschutzmitteln erfordern. Der Trend — so scheint es — geht wieder dahin, Saatgut den natürlichen Bedingungen einer Region anzupassen und bessere Anbaumethoden zu nutzen, zum Beispiel Fruchtwechsel statt Monokultur.

Petra Reategui

# Tapping the wheat potential

The diets of millions in the Middle East and North Africa depend on durum – a type of wheat used in such nutritious staples as bread, couscous, freke and bulghul. Research now promises to tap durum's potential by boosting the region's yield above current low levels.

World wheat research has tended to neglect durum in favour of the bread wheats more popular outside the Middle East. But the International Centre for Agricultural Research in the Dry Areas (Icarda) based in Aleppo, Syria, is focusing on durum as part of its brief of increasing food supplies in the region. It is collaborating in this research with the International Maize and Wheat Improvement Centre (CIMMYT).

The translucent golden-amber kernels of durum, also known as hard wheat, are tougher-textured than those of bread wheat and are particularly suitable for bulghul and couscous.

"Traditional ways of preparing durum in developing countries, which involve less processing, make it more nutritious than bread wheat products," explains Dr Jitendra P Srivastava, a durum breeder who heads Icarda's cereal programme.

"The bran, rich in protein, is not discarded in preparing durum products such as couscous, bulghul and freke. Durum is also generally higher in some nutrients than many bread wheats."

Mediterranean countries produce and consume a large share of the world's durum. The Middle East and North Africa grow 44 per cent, while Mediterranean Europe accounts for another 10.9 per cent. The Middle East and North Africa grow almost four-fifths of the durum produced in the developing world, and consume almost half the world's output.

*Collecting spikes of durum wheat*

"Durum is better suited than bread wheat to the moderate rainfall (300-450mm annually) of the Mediterranean area," says Srivastava. "In Morocco, Algeria, Tunisia, Jordan and Syria, durum is grown on two out of every three hectares planted to wheat."

In the 1950s North Africa exported durum, but today the region is the largest importer of durum in the world, importing 2.3mn tonnes in 1981-82. Durum production has not kept pace with regional demand – a trend with ominous implications for Mediterranean diets. Wheat-importing countries such as Morocco, Tunisia, Algeria, Egypt and Jordan face global durum prices on average 20 per cent higher than those of bread wheat.

Canada and the US grow the lion's share of exported durum. The rise in world bread production has far surpassed the modest increase in world durum output.

One reason for durum's fall to second place is disappointingly low North African yields. "Poor agronomic practices, irregular rainfall, diseases and unimproved varieties all contribute to low yields," explains Srivastava.

The eclipse of durum is partly due to historical events. Until 1920, for example, Egypt grew no bread wheat. But British scientists who brought their taste for European bread to the country favoured better local wheat varieties, and Egypt today grows virtually no durum. French control of North Africa and the Levant also gave a European bias to wheat research.

"More recently, when improved bread wheat varieties became available for the Middle East and North Africa in the 1960s and 1970s, durum was pushed to drier, less productive areas," notes Srivastava. As a result, local farmers can choose bread wheats that are of better quality and more resistant to disease than durum varieties.

National research programmes, in co-operation with Icarda and CIMMYT scientists, hope to change this picture by developing new types of durum. "Our breeding work at Icarda is stressing higher-yielding durum types with better disease resistance, nutritional quality and adaptability to the region's variable rainfall," explains Srivastava.

"Durum's production potential is still far greater than what's being produced now. Compared to bread wheat, however, the relatively modest investment in durum research has already paid handsome dividends. Over the long term, large-scale cultivation of durum will maintain diversity in the number of wheat species grown."

This year, Syria's agriculture ministry released a new durum variety, called Sham 1, for widespread cultivation. The line has a better yield than local varieties and is resistant to yellow rust, a major regional disease. Furthermore, its lustrous amber kernels are attractive to the consumer.

A number of other promising varieties are now being tested, in Syria and elsewhere, as part of the effort to give durum its due importance in the agriculture of the Middle East and North Africa.

**Lynn Teo Simarski**, Aleppo

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## Chickpea Yields Doubled by Winter Sowing

Researchers at ICARDA have developed large-seeded Kabuli chickpea cultivars for winter planting in Syria with yields twice as high as traditional spring-sown types. The new winter varieties and improved production practices could substantially improve Mediterranean region production, presently 500,000 tons.

Cheap protein supplied by legumes, including chickpeas, has become costlier in the last 30 years, explains Dr. K. B. Singh, an ICRISAT chickpea breeder posted to ICARDA's Food Legume Improvement Program. The region's population doubled over the period while chickpea yields remained static. Although the area under chickpea cultivation went up 14 percent, production increased only 11 percent. Dramatically higher yields are now possible, however, from ICARDA chickpea lines that can be planted in late November instead of March —exploiting the entire rainy season. Declining moisture and rising temperature make spring-planted types mature too early.

Winter-sowing not only boosts yields in the traditional producing areas, but also allows chickpeas to be grown in drier zones. The crop is normally sown in areas receiving a minimum of 400 mm annual precipitation, but new cultivars can be grown with 300 mm rainfall, since they can be planted earlier in the rainy season.

Six years of research has revealed that freezing temperatures and ascochyta blight disease are the two main hazards to winter sowing. New ICARDA lines being tested in 16 countries, from Morocco to Afghanistan, are surmounting these obstacles.

The joint ICARDA/ICRISAT program has developed a particular method to infect experimental chickpea fields with ascochyta blight. Using this technique, scientists have screened 14,000 germplasm lines of chickpea from which 17 ascochyta-resistant lines were identified. One such cultivar is ILC-482, which has been released for winter sowing by the Syrian Ministry of Agriculture, and is likely to be released in Lebanon. Syrian farmers have been positive in adopting ILC-482, according to Syrian and ICARDA scientists. Other varieties are expected to be released soon for Jordan and Cyprus.

A workshop on ascochyta blight and winter sowing of chickpeas held at ICARDA brought researchers from the region together to review the recent progress. The workshop proceedings are available from ICARDA.

Lynn Simarski, ICARDA.

News from CGIAR
Consultative Group on International Agricultural Research
Volume 4, Number 3 September 1984

# Ethiopia and the CGIAR

Ethiopia is the second most populous country in subSaharan Africa after Nigeria, but its GNP per person is the lowest. Yet Ethiopia has tremendous agricultural potential. It is the origin and center of diversity of many major food and cash crops and has more cattle, goats, sheep and donkeys than any other country on the subcontinent. While the efforts of ILCA and ILRAD to improve livestock production in the country are well known, this is only the tip of the iceberg; CIAT, CIMMYT, CIP, IBPGR, ICARDA, ICRISAT, IITA and IRRI also have collaborative relations with Ethiopian breeding and crop improvement programs.

CIMMYT for example has been exchanging wheat germplasm with Ethiopia since the mid-1960's. In 1983 two visiting scientists and three trainees came to CIMMYT from Ethiopia. CIMMYT is currently exploring with the Ethiopian government the posting of resident staff which may include two wheat scientists, an agronomist and pathologist. The principal objective will be to assist the national wheat program to improve productivity and production of wheat and to screen for stem rust resistance for which Ethiopia is one of the centers of diversity, or a "hot spot".

Last year the head of Ethiopia's bean research program visited CIAT to discuss the development of a joint bean project together with Kenya and Uganda. The creation of a regional testing network would be a major objective. According to Dr. Nickel, CIAT Director General, a number of Latin American bean varieties seem to be well adapted to Ethiopian growing conditions. While there is less disease pressure in Ethiopia, beans with a shorter cooking time than in Latin America will be necessary due to the scarcity of fuelwood. CIAT will be posting several bean scientists to Nairobi to support bean research in Ethiopia and Kenya.

CIP has been working with Ethiopian scientists since 1973 to tap the country's tremendous potential for potato production. Using CIP materials, an Ethiopian breeder geneticist at the University of Addis Ababa developed four promising varieties for mid-elevation (1850m) areas. With bilateral support from the Federal Republic of Germany,

CIP is now helping the Horticultural Development Department (HDD) in the Ministry of State Farms to increase its capacity for rapid multiplication of tuber seed and overcome storage problems, one of the major bottlenecks to increased production. CIP is collaborating with HDD to introduce the diffused light stores for tuber seeds that are being successfully adapted to other African countries. CIP has been supplying ILCA frost resistant clones to include in the rotation at their high altitude research site. While the potato has great potential in Ethiopia, consumption is low. Its value as a food and commercial crop has yet to be discovered. For instance in Rwanda, potatoes were introduced in the 1930's but did not become a popular food staple until the 1960's. Contacts have been strengthened with Ethiopia and

other east African countries through the storage expert that the U.K.'s Overseas Development Administration has seconded to CIP's regional Nairobi office.

IBPGR and Ethiopia have been collaborating since 1978 to collect and preserve Ethiopia's native crop species. In 1978, Ethiopia, with support from the German Agency for Technical Cooperation (GTZ), established a regional genebank in Addis Ababa. The Plant Genetic Resources Center (PGRC) is one of 38 institutes designated by IBPGR as a base or primary center for longterm storage of certain crops. The Ethiopian center houses the regional collection of barley. In addition to sponsoring three joint in-country collection missions for sorghum, barley and brassicas, IBPGR has arranged for local scientists to receive the training they need to maintain the germplasm facilities independently.

ICARDA has trained many Ethiopian scientists, particularly cereals and food legume researchers, through regional workshops, resident training, and senior fellowships. These include the leader of highland pulses research, a lentil/Kabuli chickpea breeder, an entomologist, and a weed control specialist. Together they represent the main pulses research team of the Ethiopian Institute of Agricultural Research. Each year ICARDA provides germplasm and several hundred breeding lines in international breeding nurseries, yield trials and agronomy trials. Ethiopia has made good use of this material through multilocational testing and one lentil and one chickpea are already at a prerelease stage. Efforts are currently underway to include Ethiopia in the next phase of the ICARDA/IFAD Nile Valley Faba Bean project in 1985.

In addition to exchanging sorghum germplasm, the Ethiopian director of sorghum research has been seconded to ICRISAT in Nairobi, through the support of the Organization for African Unity (OAU), to establish a sorghum and millet network in east Africa. IITA is also working closely with Ethiopia in maize breeding.

Ethiopia is a member of the International Rice Testing Network coordinated by IRRI. Some promising breeding lines and varieties from the international nurseries have been identified for irrigated and upland rice culture and for tolerance to low temperature. In an IRTP yield trial on an experimental station, improved varieties produced up to 8.0 tons/ha, whereas the traditional variety gave a yield of less than one ton/ha. During the directors' June meeting, Dr. Swaminathan met with Ethiopian officials and mapped out a strategy for greater collaboration. This will include research on a rice-teff cropping system, research on cold tolerance and waterlogging and a joint training program at the graduate level. Plans were also drawn up for training more Ethiopian scientists at IRRI in non-degree programs. IRRI and the Ethiopian Plant Genetic Resources Center (PGRC) are also setting up a joint program for collecting native rices. While in Addis, Dr. Swaminathan was invited by the PGRC to speak on "science and national food security" to university, ministry and development experts.

An important recent development is the collaboration between ILCA and the CGIAR crop centers. Dr. Jutzi, forage agronomist with ILCA's Highland Program pointed out that they are using materials from six international centers: highland potato clones from CIP; CIMMYT triticale nurseries and highland maize varieties; ICARDA oat and barley nurseries; CIAT beans and forage germplasm; and sorghum and soybean from ICRISAT and AVRDC.

T.. OPENING ANNOUNCEMENT

Mod. Plant research and plant cultivation are the main topics of today's programme. Our first item introduces ICARDA, the International Centre for Agricultural Research in the Dry Areas. And, after this, we deal with wild plants and their function in the developing of resistant cultivated plants.

T. MUSIC

Mod. Farmers in the tropics certainly don't have an easy job: there is rarely enough water, the fertility of the soil is often endangered, and pests and diseases profilerate better in the warm climate than in the moderate. In numerous institutes all over the world, scientists are working on solutions to these problems. One of these institutes is ICARDA, the International Centre for Agricultural Research in the Dry Areas.

Narr. ICARDA is one of the thirteen International Agricultural Research Institutes which are working in various tropical countries under the guidance of the Consultative Group on International Agricultural Research. The centre was set up in Aleppo, Syria, in 1977, and its main objective was the increase in crop yield in the dry areas. These stretch from Morocco in the West to North-Africa, Egypt, the Sudan, Ethiopia, and the Arabic countries all the way to Pakistan. Petra Reategui had the opportunity to ask the institute's director general, Dr. Mohamed Nour, about the work done at ICARDA.

T. INSERT NOUR/REATEGUI
CUE IN : "ICARDA is endeavouring..."
CUE OUT: ... a very valuable, practical feedback."

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In addition to the extensive research activities, ICARDA is also a training centre for young agriculturalists. Some 50 students attend the training courses every year, which last for six months, covering the entire period of plant growth.

ICARDA, like all the other institutes of the Consultative Group on International Agricultural Research, gets financial support from several countries in Europe, North America, Asia and the Arabic world. Other sources of support are from international organisations - such as OPEC, the Organisation of Petrol Exporting Countries, and IFAD, the International Fund for Agricultural Development.

The Middle East Magazine

No. 116 June 1984

# Secrets of a gene bank

A small building nestling in a rocky hillside south of Aleppo, Syria, shelters a priceless heritage – the world's major collection of genes (blueprints of inherited traits) of important Middle Eastern and North African crops.

The seed stock of 60-70,000 holdings for future breeding is part of the International Centre for Agricultural Research in Dry Areas (Icarda), whose main task is to improve food production.

"We're spearheading the effort to stem the loss of genetic variability in the region," says Dr Bhal Somaroo, head of Icarda's genetic resources unit. "We're also promoting the exploitation of genetic material for better agriculture."

The concept of a gene bank to safeguard plant resources for the future goes back to the pioneering work in the 1920s of taxonomist N I Vavilov at the Institute of Plant Industry in Russia, the first and most successful centre of genetic conservation.

Since the mid-1960s concern about the disappearance of germplasm has grown, particularly in relation to agricultural crops and their wild relatives, and a global network of genetic resource centres, including Icarda, has been established.

Icarda is strategically located, as many cultivated plants evolved in the Mediterranean and Near East.

The greatest variety of a plant's genes exist near its place of origin, as do the greatest number of pests that attack it. Plants with genes that resist such pests thus tend to be found where the plant first emerged. Most centres of genetic diversity happen to be in developing countries.

To preserve crop diversity for the future, Icarda expeditions collect germplasm called "land races".

"Such races – grown for a long time by farmers – have not been improved by scientists," explains Somaroo. "A land race is therefore adapted to a particular ecological environment. It also has an adaptable genetic make-up."

New scientifically-bred varieties are quickly replacing land races in most parts of the world. In the Near East and North Africa, for example, a new blight-resistant chickpea will probably supplant indigenous chickpeas.

In the future, however, the new chickpea could fall prey to an unknown insect. Breeders would then be able to draw genes from Icarda's seed collection that might prove resistant to the pest.

The growing awareness of germplasm's commercial value has led some countries to seal their borders to plant-collecting expeditions. But Icarda's international character gives it an advantage in genetic conservation work. "We're not too subject to the potential political pressure that can constrain the flow of germplasm between countries," notes Somaroo.

Icarda holds the genes of those crops for which it is responsible. The number of holdings for durum wheat and barley runs into the tens of thousands, and there are thousands of holdings for chickpea, lentils and faba beans.

Much of Icarda's stock is "active" – that is, sent to countries in the region for study or use in breeding programmes. A separate base collection is, however, to be left sealed for up to 25 years.

Geographical and genetic gaps in the gene bank are constantly being filled, and Icarda expeditions have sought germplasm from Syria, Jordan, Iraq, Turkey, Lebanon and Morocco. "We leave part of each collection with the host country and train local scientists in genetic conservation techniques to carry on after we leave," says Somaroo.

Last summer Icarda scientists explored Morocco for wild species of medic, a Mediterranean legume with potential as pasture. The centre's geneticists are part of a group sponsored by the International Board of Plant Genetic Resources to collect all land races of wheat in Morocco.

Lynn Teo Simarski, Aleppo

## Better yield and disease resistance from new wheat strains

Two new wheat varieties have been approved for large-scale cultivation in Syria. The new durum wheat variety, Sham-1, is suitable for zones A and B (with rainfall of 350 mm or more and 250-350 mm respectively), and the new bread wheat, Sham-2, for zone A. Both these varieties originated as breeding lines at the Centro Internacional de Majoramiento de y Trigo (CIMMYT), in Mexico. They were identified as promising for Syria by the International Center for Agricultural Research in the Dry Areas (ICARDA), based in Aleppo.

The Agricultural Research Center of the Syrian Ministry of Agriculture and Agrarian Reform and ICARDA jointly tested the new lines, along with local varieties, in research plots and on farmers' fields in Syria for four years for their disease resistance, yield, and adaptability. The testing established the new lines as new varieties superior to the local ones and suitable for cultivation in Syria.

The average yield of Sham-1 was 4849 kg/ha against 4257 kg/ha of the best local variety, Gezira 17, in zone A, and 3105 kg/ha against 4257 kg/ha in zone B. Sham-1 is resistant to most diseases, has better grain quality, and suffers less 'yellow berries' than Gizera-17. It is expected that this new variety will replace some of the low-yielding local varieties, such as Jori C-69. Appropriate seed treatment of Sham-1 for bunt is recommended before planting.

Sham-2, on average, yielded 3217 kg/ha against 2735 kg/ha of Mexipak, the best local variety. Sham-2 has also exhibited a high level of resistance to diseases, particularly the stem rust, leaf rust, and stripe rust, and has good grain quality. Its flour can be blended with weaker flours to improve their quality.

Both Sham-1 and Sham-2 mature a week earlier than the local varieties, thus giving extra time to farmers for land preparation for summer crops.

**Circle 203 on enquiry card**

نرجو وضع دائرة حول هذا الرقم لمزيد من المعلومات
ببطاقة الاستعلام



Note: Para. 3, line 4 should read, "kg/ha against 2953 kg/ha..."

# SYRIA UPDATE

Middle East Agribusiness

Vol. 4 No. 3 Apr 1984

by Damascus correspondent Elisabeth Tampier

THERE IS a curious paradox in Syrian agriculture today. The government is according top priority to agriculture in its current (1981-1985) development plan, with a record 17.2 billion Syrian pounds ($4.4 billion) slated for expenditure in this sector. The country has a good supply of river resources, abundant fertile land and a relatively skilled labour force (39 per cent of which is engaged in agriculture). Its agricultural potential is, in the view of experts, immense.

Achievements to date include notable successes, especially in the production of cotton and sugarbeets, as well as poultry, citrus fruits and vegetables. The 1983/84 cotton harvest was, according to the Cotton Marketing Organisation, a record one of 516,444 tonnes of seed cotton by early January, with small amounts still coming in. The yield per hectare, at 2.8 tonnes, was one of the highest among world cotton producers.

Estimates of agricultural growth vary, with a 1980 World Bank report rating it as high as 8.2 per cent in the 1970-1980 period, top among major Middle Eastern producers. Most experts believe it to be still well above the 3.3 per cent population growth, though rising living standards have also increased demand for products not available in sufficient quantities locally (especially meat and fruits).

Yet agronomists in Syria, both local and foreign, often express serious reservations about the country's agricultural prospects — at least in the short run.

Part of the problem lies in the perhaps overly ambitious plans of the national agricultural authorities. As one Syrian agronomist put it, "We have changed in a very short time from complete neglect of modern technologies in agriculture to a blind faith that science can provide all the answers right away."

Other related problems include the top-heavy bureaucracy, centrally controlled planning, pricing and marketing bodies too often isolated from producers, and inadequate studies before introducing technical innovations or large-scale projects. A recent example of this was the sudden and belated decision to plant a large maize crop in 1983, after a steep rise in world prices. Not surprisingly the attempt was a monumental failure. Attention is currently being drawn to the 'human and technical problems' obstructing development in some sectors of Syrian agriculture. If the picture that emerges appears unduly negative, it should not detract from the modest progress in overall agricultural production and the steady growth of agro-industries.

## Dryland farming

Nearly 90 per cent of the land cultivated in Syria depends exclusively on rainfall. There are sharp yearly variations in agricultural output directly related to the amount, distribution and frequency of rain. Variations are greatest in the zones of lower average precipitation.

Wheat and barley remain the major crops in the rainfed zones, although the agricultural authorities are encouraging the production of other crops such as pulses, olives, grapes, fruit and nuts in suitable areas (principally where rainfall is not less than 250mm in two out of three years).

Production of wheat has witnessed a modest rise over the past 20 years, despite an overall decrease in the areas cultivated. This is because improved seeds permit a significant gain in productivity. Whereas average yield in the 1960s was 0.8 tonnes per hectare, in 1978-1982 period it rose to 1.4 tonnes per hectare. A new wheat strain, Sham Two, just developed by the Agricultural Research Organisation and ICARDA, promises yields of over 3.2 tonnes per hectare compared to the best variety now in use, Mexipak, with a local average yield of 2.7 tonnes per hectare. Production in 1982, the last year for which figures are available, was 1.5 million tonnes, 29 per cent down on 1981 levels.

The rise in wheat production has not kept pace with demand. Whereas in the 1960s Syria was able to export small amounts of wheat in good years, it is now a major importer of wheat and wheat flour (over 600,000 tonnes of imports estimated for 1983). With the rapid development of local milling capacity — four new flour mills in 1982, two in 1983/84 and 10 more planned for the next few years — wheat flour imports will be increasingly replaced by unmilled wheat.

Syria remains an exporter of barley in good years (555,627 tonnes exported in 1982), but average yield has decreased by more than 20 per cent since the 1960s. A 1983 report by an ICARDA farming systems specialist gives an alarming picture of the drier zones of sedentary agriculture in north and north eastern Syria, where barley and sheep are the main products. The area studied, which represents 50 per cent of Syria's cultivated land and was formerly the major agricultural producing area, is characterised by serious soil erosion and depletion, with yield losses of up to 50 per cent.

The practice of fallow cropping was increasingly abandoned after mechanisation was introduced there in the 1950s, and the virtually total lack of input for soils has transformed agriculture into a 'mining activity', in the ICARDA writer's view.

Temporary migration of menfolk to urban areas and the Gulf has left a permanent farm labour force consisting increasingly of women and children, and agriculture is becoming a secondary source of income throughout the area, at a rapidly developing pace. Prospects for the future are bleak, so long as these areas continue to be marginal in national development priorities.

In a very few years reduced production in these zones could compromise progress in the irrigated and higher rainfall zones which now receive most attention because of their greater absolute potential. (See *Middle East Agribusiness*, volume 3, number 5, 1983, on plans to develop the higher rainfall regions of southern Syria.)

## Irrigated zones

It is eminently logical that Syria should try to expand its irrigated land area, given the relatively low annual rainfall and the abundance of river resources. But progress has been much slower than expected.

According to official figures the irrigated areas in Syria actually dropped from 567,000 hectares in 1981 to 555,000 hectares in 1982, after a steady increase in previous years. Whether this is due to the serious problem of salinisation or to other causes it has not been possible to ascertain.

Of the major crops grown in the Euphates basin — cotton, sugarbeets and wheat — the first two have shown remarkable increases in recent years. Cotton, Syria's major export till 1974 when it was overtaken by oil exports, has received renewed attention after a period of neglect. The record 1983/84 crop is due to better seeds, more use of fertilisers, improved pest control measures and ideal weather conditions. Production in 1982, already high for recent years, had been boosted by an 18 per cent price increase by the government. The 3 per cent price increase added in 1983 did not offset inflationary costs of fuel, fertilisers and labour.

Sugarbeet production (1.2 million tonnes in 1983, from 200,000 tonnes in 1980), while growing rapidly, is not yet sufficient to supply the country's seven sugar factories, including four new ones which are still running at reduced capacities. The sugar extraction rate was reported to have improved from 7.5 per cent in 1981 to 10.1 per cent in 1982. Full mechanisation of sugarbeet production was introduced in 1983 on state-owned farms, to serve as demonstration units for the co-operative sector.

The long-term trend to grow wheat as a winter crop on irrigated lands in the Euphrates basin should have a significant impact on the presently erratic and insufficient production of this important crop.

Recent independent studies in the lower Euphrates valley have shown that salinisation causes more than 4,000 hectares in this zone alone the disappear yearly from agricultural usage. The cost of bringing one hectare under irrigation, originally estimated to cost 12,000 Syrian pounds, is now close to 100,000 Syrian pounds, and productivity remains far below its full potential on irrigated lands in the area.

A major reason for this is the 'parcellisation' of plots, but a lack of co-operation between growers and agricultural authorities may contribute to low productivity. One study has suggested that in the absence of clear economic incentives, some farmers neglect or even sabotage crops they are obliged to plant (for example by seeding their useless salty soils), while giving their greatest attention to the small plots reserved for domestic consumption or free market fruits and vegetables.

## Extension services

A centrally planned agricultural policy can achieve positive results if growers are fully informed about goals and motivated to participate. Unfortunately this is far from being the case. Farmers have been known to destroy delicate soil-measuring apparatus and to desert villages *en-masse* when survey teams arrive because they were not told in advance the purpose of these measures and were sceptical that their interests were the primary consideration.

Growing awareness of the general problem has led on the one hand to calls for greater punitive enforcement to ensure crop production necessary to the national plan. On the other, it is probably a major reason behind the large-scale project to expand extension units throughout the country; 105 such units are scheduled to be opened in 1984 from a total of 600 planned by 1985, with three agricultural technicians to be trained per unit.

Until recently most extension work was carried out through the Peasants' Union but the function was regulatory rather than advisory. If positive co-operation is to be achieved, extension experts believe, a clear distinction must be made between these functions. The role of extension personnel should be to advise, organise and teach, not to enforce rules.

If extension is to fulfil its primary aim, to introduce technical improvements to farmers, national research services must be at a level parallel to the extension services. Technical findings should be subject to careful economic studies and analysis before large-scale implementation. Some experts in the country are concerned, however, that it is no use recommending technical innovations if the information on their economic viability is not available.

A recent vogue encouraged by the agricultural authorities — undercover cultivation — has already been compromised in the hoped-for achievements for this very reason. Undercover cultivation was given a major boost in recent years primarily to replace high-priced winter vegetable imports with local produce. A detailed economic study of a pilot project growing tomatoes and cucumbers, the major greenhouse crops, showed serious problems of economic viability and no profits at all if heating was necessary (which it usually is). High fuel costs are causing farmers to abandon greenhouse crops other than flowers and ornamentals.

## Mechanisation

A second trend, towards mechanisation, will undoubtedly progress because of rising labour costs and a dwindling farm labour population. Imports of farm machinery are given priority, and local production of tractors rose by 50 per cent in 1983 (to 4,500 units). At present most seeding is still done by hand, and the cotton crop is almost entirely hand-picked. In Syrian conditions, where farms tend to be small and plots non-contiguous, mechanisation requires a careful study of appropriate machinery. A particular problem of concern to experts is that the land levelling essential to avoid salinisation in irrigated zones requires complex machines and operating skills not accessible to individual farmers.

The problems outlined here are not unique to Syria, nor are they insurmountable. Time and experience will certainly solve some of them, as has already been shown in the largely successful Ghab Valley project in central Syria. There too experts were pessimistic because of the gap between the ambitious goals and local technical and human resources. But after 30 years of implementation real improvements have occurred both in the farmers' living standards and in agricultural production, as called for in the overall national development plan.

News from CGIAR
Consultative Group on International Agricultural Research
Volume 4, Number 1 March 1984

## ICARDA Nile Valley Project

The Sudanese National Research Program recently presented ICARDA's Nile Valley Project to ISNAR as the best project model so far experienced in Sudan. As a result ISNAR is starting a case study of the project to review its features and compare it to other projects.

The primary objective of the project is to increase faba bean production in the Nile Valley. The crop is a popular staple of local diets and demand for it is on the rise. The project is based on a multidisciplinary approach with extensive involvement of national scientists from government institutions and universities in both Egypt and Sudan, and location of many of the field experiments in farmers' fields. The research, both on farmers' fields and on the research stations, is conducted by national program scientists with ICARDA providing only administrative and technical backstopping. Annual work plans are laid down at joint coordination meetings before the start of each season.

## ICARDA Releases New Wheats

Two new wheat varieties for large-scale cultivation in Syria were approved recently by the Syrian Variety Release Committee. The new durum wheat variety, Sham-1, is suitable for areas with annual rainfall of 250 mm and above and the new bread wheat variety, Sham-2, is suitable for areas with annual rainfall of 350 mm and above in Syria. Both these varieties originated as breeding lines at CIMMYT in Mexico and were identified by ICARDA as promising for Syria.

The Agricultural Research Center (ARC) of the Syrian Ministry of Agriculture and Agrarian Reforms and ICARDA jointly tested the new lines, along with local varieties, in research plots and on farmers' fields for 4 years. These tests looked at disease resistance, yield, and adaptability. The testing established the new lines as new varieties superior to local ones and suitable for cultivation in Syria.

About 67% of the 1.22 million ha under wheat in Syria is planted to durum wheat and the remainder to bread wheat. Researchers hope that these new high-yielding varieties will be welcomed by Syrian farmers and consequently boost wheat production in Syria. The National Seed Organization of Syria is multiplying the seed of Sham-1 and Sham-2 for distribution to farmers.

**ICARDA News Release, December 1983**

## Farming Systems Research Newsletters

ICARDA released the first issue of its ***Farming Systems Research News for the Middle East and North Africa*** in October. Director General Mohamed A. Nour announced that the newsletter "will be published periodically with the major objective of improving communication among scientists in the region interested in FSR. We hope it will (a) generate a greater commitment to FSR activities, (b) encourage discussions and debate on new ideas in FSR, and (c) improve the dissemination of information on FSR in books, articles, workshops, etc. ICARDA has an interest in building a network of farming systems researchers in this region and this newsletter will be an important part of that network."

To receive the newsletter or to contribute pertinent information write to Paul Neate, Editor, ICARDA, P.O. Box 5466, Aleppo, Syria.

Another farming systems research newsletter is produced by the CIMMYT Eastern Africa Economics Program in Kenya. To receive or contribute to the newsletter write to CIMMYT, Eastern Africa Economics Program, P.O. Box 25171 Nairobi, Kenya; telephone 592054/592206.

S. Varma

# *Managing the Mountains for More Food*

Agriculture in the mountainous regions of the Middle East and North African countries is challenged not only by freezing winters but also hot dry summers and shallow soils. The yield potential of mountain varieties is low, and the technologies developed for lowlands are often not applicable to highlands.

The mountain farmer has received little support from agricultural research in his battle against the harshness of nature, compared to his neighbours in lowlands.

ICARDA (International Center for Agricultural Research in the Dry Areas), based in Aleppo, Syria, has developed plans to understand the plight and explore the potential of mountainous areas in the Middle East and North Africa. Serving the dry-area countries of the world, ICARDA is one of the 13 international agricultural research centers receiving support from the Consultative Group on International Agricultural Research (CGIAR) for their global effort to produce more food.

Nine of the countries served by ICARDA have high-elevation areas at altitudes of above 1000 meters: Afghanistan, Iran, Pakistan, Iraq, Turkey, Algeria, Morocco, Tunisia, and North Yemen. The high-elevation areas there account for about half of the wheat hectarage and over 91 million of the sheep and goat population. Agricultural research in lowlands had demonstrated higher economic returns from integration of crop and livestock research. This may be true in mountainous areas also, but needs to be evaluated.

The cereal programme of ICARDA has launched experiments at five high-elevation areas: three in Quetta in Pakistan and two in Morocco. Germplasm nurseries are also provided to Iran and Afghanistan. The major research activity is at Quetta where a collaborative project has been running for two years with the Arid Zone Research Institute (AZRI) of Pakistan and the Provincial Agricultural Research Institute, Saraib. The project receives support from ICARDA and the government of Pakistan but further support to strenghten it is being sought from a donor agency. The agroclimatic and socioeconomic conditions and production practices at Quetta bear similarities with other high-elevation areas in countries served by ICARDA.

**ICARDA and AZRI researchers evaluate a promising wheat cultivar at Quetta site in Baluchistan.** Photo: Varma

The major thrust of research at Quetta is on wheat and barley, the two most important cereal crops in mountainous areas, but some attention is also being paid to triticale, a man-made crop by crossing wheat and rye, which has shown promise in blends with wheat flour and as animal feed.

ICARDA has a handsome collection of wheat and barley accessions in its germplasm bank. The research approach is to cross the mountain varieties with the available high-yielding accessions of wheat and barley and then test the progenies at high-elevation sites. Appropriate agronomic practices are being developed for improving the productivity of wheat and barley. Significant response of wheat to fertilizer nitrogen has been recorded. Attempts are being made to identify adapted lentil varieties that would provide food to the people and some biological nitrogen to the soil. Rotation of such lentil varieties with cereals will be of great advantage.

Mr. Salah-Uddin Ahmed, Director of AZRI, Quetta, visited ICARDA recently to evaluate the Quetta project and formulate the future course of research with the Center's scientists. He told that the government of Pakistan had assured full support to the project.

More information is being gathered about the problems facing crop and livestock production in the high-elevation areas. Projects are also being designed for research in food legumes, farming systems, and rangeland management. When adequate resources become available, ICARDA has plans to locate necessary staff at Quetta to work with national scientists toward strengthening of the research capability of AZRI so it may better serve the needs of the small farmer in Baluchistan. Steps are being taken to train research staff from high-elevation areas so as to make expertise locally available for more effective research.

Large areas of potentially arable land exist in mountainous and submountainous regions: Baluchistan province in Pakistan alone has 5.4 million hectares. When such areas are brought into cultivation and when high-yielding varieties with resistance to pests and diseases and tolerance to stresses of physical environment become available, the food production in ICARDA's mountainous areas should be substantially increased.

S. Varma is Science Editor with ICARDA, Aleppo, Syria.

# The Arab food crisis

Of the $278mn in loans approved by Ifad in 1983, $34.3mn or 12 per cent went to the Near East and North Africa. This is much less than the allocations to Africa and Asia, which received 44 and 36 per cent of the total, respectively.

But although the state of the region's agricultural sector may be less desperate than in Africa and Asia, Ifad's annual report notes that "despite notable increases in agricultural production, the Near East and North Africa continues to face increasing deficits in the domestic supply of basic food staples."

In an attempt to deal with this "grave situation", Ifad's operations in the region in 1983 concentrated on reducing income disparities and creating employment by financing irrigation schemes benefiting small farmers. Ifad approved three loans for the region in 1983.

● **Morocco.** Ifad is lending SDR15.7mn (about $17mn) to the Central Haouz irrigation project. The project includes irrigation and drainage, land development, planting wind-break belts, constructing rural roads and improving extension services.

Of the total project cost of $425.9mn, the Arab Fund for Economic and Social Development is providing $55.5mn, the Kuwait Fund for Arab Economic Development $37.0mn, the Abu Dhabi Fund for Arab Economic Development $32.9mn and the Saudi Fund for Development $39.4mn.

● **Tunisia.** Ifad is lending some $7.3mn to the Sidi Bouzid irrigation project, which the fund itself initiated. The project will benefit some 6,800 families, and includes developing ground-water resources, improving water management and strengthening institutions involved in operating and maintaining the irrigation water supply. The total cost is $16.3mn, and the co-operating institution is the World Bank.

● **Sudan.** Ifad is to lend SDR9.5mn (about $10mn) for the rehabilitation of agriculture in the northern region. The project will benefit farmers in three districts, by providing irrigation equipment and spare parts through medium-term credit, will supply short-term loans for seasonal farm inputs, and will strengthen farm support services.

The project was initiated by Ifad, and will benefit 40,000 families. Of the total $23.1mn cost, the Opec Fund for International Development is to provide $8.2mn. The World Bank is the co-operating institution.

Ifad now has 23 projects under implementation in its Near East and North Africa division, and division director Samir Asmar says there is now "a more positive response from governments in their financial and moral commitment to the success of these projects". Although lending in his division focused last year on irrigation schemes, Asmar says that, in general, there is greater emphasis on rain-fed agriculture, and the next projects due for approval are in rain-fed areas.

Asmar is enthusiastic about Ifad's growing co-operation with the UN Children's Fund (Unicef) and the World Health Organisation (WHO). Last April, a joint Unicef-WHO team visited Ifad to identify possible areas of collaboration, which Asmar describes as an "innovative idea of combining production with nutrition and health".

Ifad has identified a project in Morocco combining the three agencies, which is expected to be submitted for approval in early 1985.

The fund is keen to encourage regional bodies involved in helping the small farmer and increasing agricultural production. In December 1981 it gave a $1.15mn grant to the Khartoum-based Arab Organisation for Agricultural Development (AOAD) to finance four training courses.

AOAD used the grant for two 12-week courses in Syria and Jordan, and two five-week courses in Khartoum, and had enough money left over to organise a workshop in Tunisia late last year.

According to the director-general of the AOAD/Ifad programme, Sayed Hussain Ahmad, it is management problems rather than a lack of finance that hinder many of the area's agricultural projects. The Tunis workshop was thus designed to discuss the obstacles to disbursement, and was attended by project directors or their deputies from some 15 of the most important Ifad-funded agricultural projects in the Middle East.

Sayed Hussain Ahmad sees management training as crucial. Projects are often managed by graduates with good technical qualifications but "no idea of the decision-making processes over the lifetime of a project".

He stresses the need for closer co-operation between financing agencies and project managers. There are often major differences between the contents of a project appraisal report and its actual implementation, because the appraisal report "doesn't reflect the life of the people", he says.

Ifad is also helping the Amman-based Near East and North Africa Regional Agricultural Credit Association (Nenaraca), to which more than 30 agricultural credit institutions belong. In May 1983 it gave the organisation a grant of $941,000.

The project lasts from 1983 to 1987 and includes six regional training courses for 15-25 staff from member institutions, with preference given to staff from the poorer countries.

One aim it "to devise and improve methods to encourage the farmers to take and process credit in a shorter period," says Ifad project controller Faysal Ruwayha.

He attaches particular value to the planned exchange of around 60 middle or upper-level staff as part of the project, and says "organisations will benefit from each other". He points out that many Ifad projects include a credit component.

The Nenaraca project conference/workshop and three seminar/workshops, and includes one will provide teaching materials adapted to local conditions.

Ifad also supports centres co-ordinated by the Consultative Group for International Agricultural Research (CGIAR), including the Aleppo-based International Centre for Agricultural Research in the Dry Areas (Icarda). In 1983 it approved grants for Icarda of $1.5mn to help with a Nile valley research programme on faba beans and $650,000 for research on cereals.

The Arab Centre for the Study of Arid Zones and Dry Lands (Acsad) also receives help from Ifad, which last year approved a $550,000 grant for research.

News from CGIAR
Consultative Group on International Agricultural Research
Volume 3, Number 3
September 1983

# CGIAR in Tunisia

Translation of Statement by
Mr. Adel Kamoun
Chef de Cabinet of His Excellency the Tunisian Minister of Agriculture
Tunis, June 1983

On behalf of his Excellency the Minister of Agriculture and on my own behalf, I am pleased to welcome you to Tunisia. I would like to express our pride at hosting such an eminent group of agricultural researchers. You will continue to be a great inspiration to us in the development of our own national organizations and contribute to our efforts to make great strides forward. Your choice of Tunisia as a venue for this important meeting is clear evidence of the importance the international agricultural research centers (IARCs) attach to the problems of agricultural development and to achieving self-sufficiency in food production in the developing countries of the world.

I wish particularly to express my thanks to Dr. Mohamed Abdulla Nour, chairman of the centers' directors, and chairman of the present conference, for his initiative and for his keen interest in widening the activities and the impact of the CGIAR in this part of the world.

Tunisia is fully aware of the pioneering scientific role of the IARCs, guided by the noble aims of combating famine and malnutrition. By improving the level of agricultural production and increasing yields of vital food crops they seek to secure an adequate income for farmers everywhere and achieve a stabilization of rural communities.

Since its independence, Tunisia has mobilized vital forces to raise the level of agricultural production. It has undertaken several development projects and has made available the water resources essential for agriculture. We have also endeavoured to set up the efficient infrastructure needed for such projects. These efforts have been enhanced by the priority afforded to agricultural development in the 6th 5-year plan of 1982-1985, which has immense popular support and which is considered a vital turning point in Tunisia's agricultural policy.

With regard to agricultural research, the Ministry of Agriculture fully supported and strengthened research projects by setting up many experiment stations throughout the country. It has also set up regional centers and has directed a great deal of material and moral support to agricultural researchers to help them concentrate fully on their work. Moreover, institutions involved in agricultural higher education are also conducting valuable research work, and contributing to the development of the agricultural sector.

We have endeavoured to link agricultural research more closely with educational programs, as well as with agricultural extension and development projects. Such links have undoubtedly contributed to the achievement of several important research results, and have allowed research to make an effective contribution to agriculture and the improvement of agricultural production. We are also determined to increase our efforts in research through greater levels of cooperation with other countries.

Tunisia has had a unique experience with several of the international centers since their inception. Such cooperation has resulted in the training of many scientists and in the strengthening of research programs. Our cooperation with CIMMYT dates back to the early 1960's and still contributes positively to the improvement of yields and towards the improvement of many varieties of wheat. Such pioneering experience is undoubtedly of great importance in the agriculture sector. Our relationship with CIP, now in its 8th year, has resulted in the establishment of a regional office in Tunis to serve the countries of the southern Mediterranean.

Three years ago we initiated a cooperative program with ICARDA. This involves the supply of experts and equipment to augment our national research efforts, particularly in the spheres of barley and food legumes. I am pleased to say that this cooperative effort is now beginning to yield results, despite the fact that it is still in its very early days. It is also planned to strengthen the contacts with ICARDA, so that the activities in Tunisia can become the regional basis for the North African (Al-Maghrab) countries.

In this connection I should not overlook the cooperation with the other international centers. We are very happy with this cooperation. We would welcome, though, any strengthening of this cooperation so that it can fulfill the needs of the Tunisian agricultural sector and help us realize our goals of improving agricultural production and achieving self-sufficiency.

The mission of the international centers is a noble but difficult one. We fully realize that it is very difficult for the thirteen centers to cover all the needs of the countries of the Third World in the agricultural sphere, though the majority of the centers are based in such countries. It is vital that the centers' efforts interweave with the efforts of the national research programs.

Such interaction is already a major component of the centers' programs, but they must work towards strengthening the various national research organizations, without which they cannot fully reach their goals. The difficulty of fully understanding the local farming communities, the wide variety of climatic conditions, social constraints, and the differing levels of technological abilities all require conducting specialized experiments and/or adapting the results obtained elsewhere, to suit local conditions.

It is the duty of the international centers to augment their own efforts by strengthening the cooperation and exchange of information with the national research programs so that their efforts will bear the hoped for results in the shortest time possible.

In conclusion I wish your meeting all success and I wish all the participants a happy stay among us in verdant Tunisia.

## Iranian agriculture officials tour ICARDA research facility

A delegation of Iranian agricultural officials recently were hosted by their scientific counterparts at the International Centre for Agricultural Research in the Dry Areas (ICARDA) in Aleppo, Syria.

The delegation was headed by Dr Abbas Al Zali, Deputy Minister of Agriculture. It also included Mr Hassan Tabatabai, Deputy Minister for Farm Organisations; Dr B Y Samadi, Deputy Minister for Agricultural Research; and Mr M H Mosavy, a member of the research staff of the Iranian Dry Farming Project.

The visiting agricultural scientists conferred with the host personnel to exchange ideas and publications and to explore further mutual co-operation. They toured the main research station at Tel Hadya and met with ICARDA's acting Director General and scientists working on its various programmes.

Dr Al Zali invited ICARDA personnel in turn to visit Iran.

## Syria and ICARDA review joint agricultural research

Senior scientists and administrators from the Directorate of Scientific and Agricultural Research (ARC) of the Syrian Ministry of Agriculture and Agrarian Reform, and the International Center for Agricultural Research in the Dry Areas (ICARDA), held their second annual meeting in September at ICARDA's headquarters in Aleppo, to review their joint agricultural research.

The meeting took place under the auspices of His Excellency the Minister of Agriculture and Agrarian Reform. Senior representatives of ACSAD (the Arab Center for the Studies of Arid Zones and Dry Lands), Aleppo University, Teshreen University, Damascus University and the Syndicate of Arab Agricultural Engineers also participated.

Co-operative agricultural research between ARC and ICARDA started in 1977 and achieved a sound footing in 1981/82 when over 152 trials in cereals, 48 in food legumes, and 31 in pasture and forage crops were conducted in Syria. The trial sites were spread from Dera'a in the far south to Kamishly in the far north, and from Gableh and Lattakia in the Syrian cost to the range and steppe areas near Salameiah and Aleppo. These trials were repeated in 1982/83.

Thirty scientists and technicians were trained in ICARDA through the joint programme on different aspects of agricultural research during the 1982/83 season.

Among the notable achievements of the joint research have been the identification of a chickpea cultivar ILC 482 for winter sowing in Syria, and several promising lines of lentils, durum and bread wheats, and forage and pasture crops. About 1.5 tonnes of pure seed of ILC 482 was provided to the National Seed Organization for multiplication and distribution to farmers.

A joint annual report of the work has been prepared. It was distributed and discussed at the meeting to formulate the research strategy for the 1983/84 season.

This news item appeared on page 8 of the May 13, 1983 issue of:

PROVINCIAL AND DISTRICT NEWS (Pakistan)

# Stress laid on proper research of mountainous regions

ISLAMABAD, May 12: Dr. E.H. Matheson, Director, High Elevation Research of International Centre for Agricultural Research (ICARDA) said here on Monday that the mountainous regions of Pakistan deserved proper attention for research and development so that their neglected potential was utilised.

The agricultural expert said that his centre had keen interest in the development of the highland and dry regions of the country.

Dr. Matheson made these remarks at his meeting with Dr Amir Mohammad, Chairman, Pakistan Agricultural Research Council here on Monday. Dr. Matheson visited PARC, accompanied by Dr. M. Tahir, Senior Scientist, Cereals, CARDA.

Dr. Matheson said his centre is ready to work in collaboration with the Pakistani scientists for the realisation of the objective of using the potential of such dry areas.

Dr. Matheson and Dr Tahir are actively participating in a collaborative research programme between the Government of Pakistan and ICARDA scientists at the Arri and Sariab research station Quetta.

1. According to a Press release, the visitor's mission on this occasion in the first instance is to involve with PARC in the further planning of a much expanded programme of agricultural research in Baluchistan, which hopefully will be initiated in 1934.

Secondly, the visitors who left for Quetta on Monday will hold technical discussions with scientists there on aspects of the current programme.

Thirdly, they expect to finalise arrangements for the visit of several national scientists to ICARDA's base programme in Syria where they will be guests of the centre which provides training for junior scientists from Pakistan and other countries of the regions.—APP.

# يوم حقلي يقيمه المركز الدولي للبحوث الزراعية في المناطق الجافة «ايكاردا»

## وزير الزراعة ومحافظ حلب يتفقدان حقول زراعة الاصناف المبشرة من الشعير والقمح

**اقام المركز الدولي للبحوث الزراعية في المناطق الجافة « ايكاردا » يوما حقليا في تل حديه حضره السيد وزير الزراعة والاصلاح الزراعي الاستاذ عماش جديع والسيد المحافظ الاستاذ محمد موالدي والرفيق جاسم الحسين رئيس مكتب الفلاحين الفرعي والاستاذ عبد المنعم حموي رئيس فرع الهيئة المركزية للرقابة والتفتيش والمهندس وليد الحافظ مدير الزراعة والاصلاح الزراعي والدكتور نعسان محمد المدير العام لمؤسسة اكثار البذار وأعضاء الاسرة الزراعية وعدد من الاساتذة في كلية الهندسة بجامعة حلب وممثلون عن وزارة التخطيط .**

وقد كان في استقبال السادة الحضور الدكتور محمد عبدالله نور المدير العام للمركز ومعاونه الدكتور عدنان شومان والمهندس احمد موسى العلي رئيس دائرة العلاقات العامة. وبعد الترحيب بالضيوف القى السيد الدكتور محمد عبد الله نور كلمة تحدث فيها عما يقوم به المركز الدولي للبحوث الزراعية في المناطق الجافة من أعمال ودراسات في مجال تحسين سلالات بعض اصناف المحاصيل الزراعية وزيادة انتاجيتها ، واعقب ذلك عرض صور « سلايد » عن نشاطات المركز في المجالات المختلفة . وقام بعدها السيد وزير الحسين وصحبهم بجولة عامة في مزارع الدولة صحبهم فيها السيد المدير العام ومعاونه وخبراء المركز، واطلعوا خلالها على حقول زراعة الاصناف المبشرة من الشعير والقمح الطري والقاسي وحقول زراعة الحمص الربيعي والاليات الجديدة الخاصة بزراعته وحصاده.

كما اطلعوا على الزراعات الرعوية الحولية والاعلاف الممكن الاستعاضة بها عن البور لدى برنامج الاعلاف والثروة الحيوانية . واطلعوا كذلك على طرق مكننة المحاصيل البقولية ضمن برنامج البقوليات ، والزراعات البديلة لزراعة الشعير في المناطق الجافة . كما زاروا قسم الاغنام والمراعي في المركز واطلعوا على الاعلاف التي تقدم للمواشي .

وبعد جولة موسعة في حقول المركز الدولي قام السيد الوزير والسيد المحافظ والرفيق رئيس مكتب الفلاحين الفرعي وصحبهم بزيارة مواقع الابنية الرئيسية التي يجري تنفيذها من قبل مؤسسة الاسكان العسكرية الفرع ٣ وكان في استقبالهم مدير الفرع المهندس مأمون مدرس الذي شرح لهم مراحل انجاز الاعمال في هذه المباني التي ستضم مخابر حديثة وبيوتا زجاجية وقاعات للمحاضرات والاجتماعات ومكتبة عامة ومكاتب للموظفين وعدد من المناز لوتبلغ نفقات هذا المجمع في حدود ٣٠ مليون دولار .

كما زاروا المختبرات التي تجري فيها فحوص الحبوب ودرجة انباتها وقسم الكمبيوتر واعقب ذلك مناقشة عامة بين ضيوف المركز والخبراء والفنيين العاملين فيه .

وفي الساعة الثالثة والنصف بعد الظهر انتهت هذه الجولة

# رئيس مجلس الوزراء يرعى المؤتمر السنوي لتاريخ العلوم في جامعة حلب

**حلب ــ سانا ــ تحت رعاية السيد الدكتور عبد الرؤوف الكسم رئيس مجلس الوزراء يفتتح في الخامس والعشرين من الشهر الحالي المؤتمر السنوي الثامن لتاريخ العلوم عند العرب والذي ينظمه معهد التراث العلمي العربي في جامعة حلب .**

وسيلقى في حفل افتتاح المؤتمر الذي يستمر يومين كلمات السيد راعي المؤتمر ورئيس جامعة حلب ومدير معهد التراث العلمي العربي والسادة العلماء المشاركين. وسيعقد المؤتمر خمس جلسات علمية يناقش فيها اكثر من ٢١ بحثا تتعلق بمنهج البحث العلمي عند ابن ابي اصيبعة وتحقيق في سيرته واثاره ، وطب النقراء عند الرازي وابن الجزار والمصادر التراثية العربية في تراجم المتطببين ومؤلفاتهم العلاجية في الطب القديم حسب مذهب ابن سينا ، والمصطلح الطبي في كتاب عيون الانباء لابن ابي اصيبعة ،والتخصص والولاء البيئي في النبات ، وبداية المعاجم النباتية عند العرب ، والمخطوطات العربية في الفن والزراعة ومصادرها القديمة وميزاتها وحدود منتوجاتها ، ونهاية الارب في علم الابار عند العرب والتناظر في عمارة التراث.

وسيرافق انعقاد المؤتمر افتتاح ثمانيه معارض لانواع الخطوط العربية واللوحات والصور الفوتوغرافية الاثرية والتراث التشكيلي والشخصيات العربية التراثية والات رفع الماء والمخطوطات العربية والمنتجات الحرفية التقليدية.

كما ستعقد الهيئة العامة للجمعية السورية لتاريخ العلوم عند العرب اجتماعها السنوي حيث ستناقش التقارير