



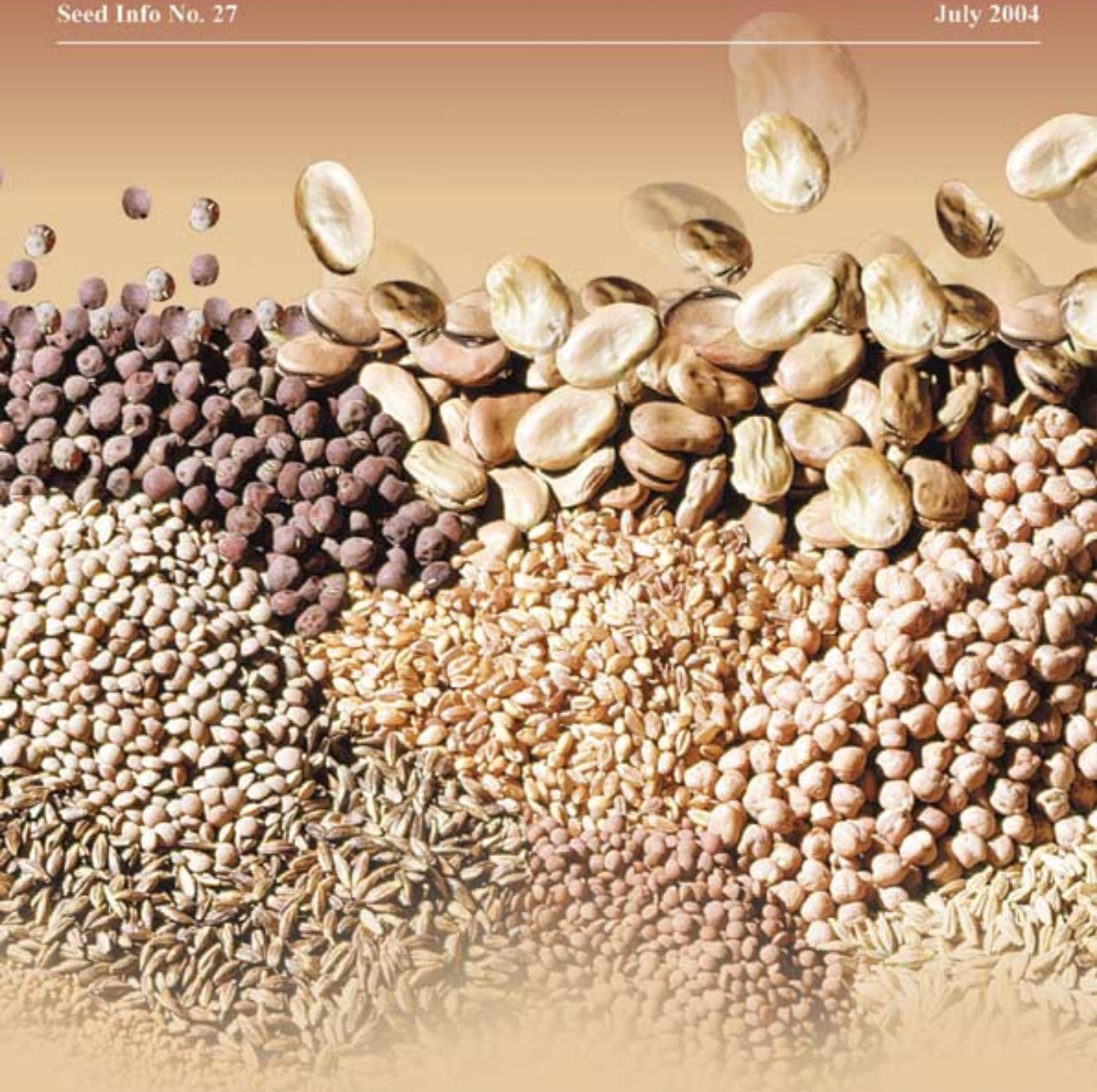
SEED INFO

Official Newsletter of the WANA Seed Network



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EDITORIAL NOTE

Seed Info aims to stimulate information exchange and communication among seed staff in the Central, West Asia and North Africa (CWANA) region. The purpose is to contribute towards the development of stronger national seed programs which supply quality seed to farmers.



The last issue of *Seed Info* focused on trends in seed legislation in developing countries with emphasis on deregulation. Following the grant of patents on living materials in the early 1980s and the conclusion of international agreements in Trade Related Aspects of Intellectual Property Rights (TRIPs) of the WTO in 1993, Intellectual Property Rights have gained importance in the seed sector worldwide. In the **VIEWS** section of this issue we feature the Intellectual Property Rights (IPRs) on Seeds with emphasis on patents and breeders' rights by your regular contributor N.P. Louwaars, from Wageningen UR, The Netherlands. We also bring you updates on recent meetings of the African Seed Trade Association, (AFSTA), the Egyptian Seed Association (ESAS), the International Seed Testing Association (ISTA) and the International Seed Federation (ISF).

The section on **SEED PROGRAMS** includes news from Afghanistan, Algeria, Ethiopia, Iran, Morocco and the Central Asian Republics. The FHCRAA activities in Afghanistan describes the four new projects being implemented under the Rebuilding Agricultural Markets in Afghanistan Program (RAMP) dealing with demonstration and technology transfer, establishment of village-based seed enterprises, potato seed production and the introduction of protected agriculture. From Algeria we report on the establishment of the national seed association, as a focal point for the private sector. Country reports from elsewhere present crop variety releases of cereals, legumes and forages across CWANA. It is expected that the national seed programs will play a greater role in the adoption and diffusion of these new crop varieties.

For a seed testing laboratory to be accredited, it must establish a quality system, but, to keep the accreditation valid, it should ensure that the system is properly implemented. The evidence for successful establishment, implementation and improvement of a quality system is ascertained by the audit. Hence obtaining and maintaining accreditation depends on inspection by an independent audit. In the **HOW TO** section, your regular

contributor, Abdoul Aziz Niane, presents the procedures for auditing a seed testing laboratory to ensure that all aspects of its quality system are effective, fully implemented and adhered to by its staff at all levels.

The **RESEARCH** section is aimed at capturing information on adapted research relevant to seed program development in the region or elsewhere. In the last issue we presented an article comparing forage seed production at a research station and at farm levels in northeast Syria. On the other hand, indigenous forage species play an important role in the long-term sustainability of rangelands because of their adaptation to the environment. They could be alternative feed resources compared to exotic or imported forage species with high demand for scarce water resources. However, the availability of seed of indigenous forage species is a major limiting factor. In this issue we present efforts undertaken on seed production of indigenous forage species in Dhofar Jabal region in southern Oman.

Seed Info encourages exchange of information among professionals to broaden our understanding of issues that affect the seed industry nationally, regionally or globally. We encourage our readers to take the lead in sharing their views through this newsletter.

Have an enjoyable read.

Zewdie Bishaw, Editor

WANA SEED NETWORK NEWS

This section presents information related to the WANA Seed Network. It provides updates on the progress of Network activities and reports on the meetings of the Steering Committee and WANA Seed Council.

Network Publications

The WANA Seed Network continues to implement its primary function: the exchange of information through various technical and non-technical publications. The WANA Variety Catalogue has been updated and is being printed. The Catalogue assembles information on crop varieties (and their synonyms) as well as breeders/maintainers of varieties grown in the region. It contains all information provided by Country Representatives of the WANA Seed Network up to 31 December 2003. The DPVCTRF, Morocco and the Seed Unit at ICARDA made the final preparation and editing of the publication. The catalogue is also updated on the ICARDA Seed Unit website. For more information or access to some of the network publica-

tions, please visit the website at http://www.icarda.cgiar.org/seed_unit/SeedUnit/home.htm. If you need hard copies of the publications, please contact the WANA Seed Network Secretariat, Seed Unit, ICARDA, P. O. Box 5466, Aleppo, Syria; Fax: ++963-21-2213490; E-mail: z.bishaw@cgiar.org.

Change of Address

The Country Representative of Iraq, Dr Awad Issa Abbas now has an e-mail address to facilitate fast and direct contact on Network related matters. Moreover, he has been appointed the Director of Field Crops Research in State Board of Agricultural Research which replaced the defunct IPARC. His address is: Dr Awad Issa Abbas, Field Crops Department, State Board of Agricultural Research, Ministry of Agriculture, Baghdad, Iraq; E-mail: awadabbas@yahoo.com; aplid-res@yahoo.com.

The headquarters of the Turkish Seed Industry Association has moved to a new location in Ankara, but the telephone and facsimile numbers remain the same. The contact address is: Ayhan Elçi, General Secretary, Turkish Seed Industry Association, Mithatpasa Caddesi Fazilet Apt. No: 50/4, Yenisehir, Ankara, Turkey; Tel: ++90-312-4320050, 4322650; Fax: ++90-312-4320050; E-mail: ayhane@turkted.org.tr; turkted@turkted.org.tr; Web site: <http://www.turkted.org.tr>.

NEWS and VIEWS

News, views, comments and suggestions on varieties and seeds are included in this section. It is also a forum for discussion among professionals in the seed sector.

Intellectual Property Rights on Seeds

Introduction

Intellectual property rights (IPRs) intend to provide an incentive for investments in research through the provision of exclusive rights on the commercial exploitation of an invention. The first international agreement on patents was concluded in Paris in 1883, but this excluded, among other things, living organisms and agricultural methods. It was deliberate for of ethical (against privatising life forms), practical/legal (difficulty to describe a variety in an industrial manner) and political reasons (food security).

The USA introduced plant patents for vegetatively propagated (ornamental) crops in 1930 in order to protect breeders whose plant materials could easily be misappropriated once released. Several European countries took another approach and

developed a protection system that was specially designed for plant varieties with criteria and scope of protection that significantly differ from the industrial patent system. These laws on plant breeders' rights were harmonised in 1961 leading to the establishment of the International Union for the Protection of New Varieties of Plants (UPOV).

Despite these developments, intellectual property rights were and are still based on national legislation. There is no such thing as an international patent or breeders' rights.

Patents and breeders' rights

Since the early 1980s when utility patents were first granted on living materials in the USA, and 1993 when the international agreements in Trade Related Aspects of Intellectual Property Rights (TRIPs) of the WTO were concluded, IPRs have gained importance in the seed sector worldwide.

At present, 54 countries have signed a UPOV Convention on Plant Breeders' Rights and in recent years several others have developed their own laws without joining the international organisation. Few countries recognize patents on plant varieties like the USA. Most have chosen to exclude plant varieties from this very powerful system, mainly because they consider that it does not fit into the agricultural sector.

It could be argued that new varieties don't comply with the requirements for patents such as novelty, non-obviousness (inventive step) and the description that allows others 'skilled in the art' to reproduce the invention. UPOV provide solutions to such issues by designing different criteria for protection of varieties i.e. distinctness, uniformity, stability and novelty. In addition, breeders' exemption was introduced to allow breeders to freely use protected varieties for further breeding. The 'farmers' privilege', furthermore, allow farmers to save and re-use seed of protected varieties. These two exemptions are not included in standard patent laws.

However, the rights of plant breeders have become stronger in many countries, following the subsequent UPOV Conventions as a result of the developments in the commercial seed sector in the member countries.

In addition, the developments in biotechnology increase the patenting of genes or biotechnological methods that effectively patent plant varieties in which such genes have been introduced. Such varieties may thus not be available for further breeding or seed saving. A recent high-court ruling in Canada in favour of Monsanto and against a

farmer who used a mixture of roundup-ready and conventional canola varieties confirms that the patent on the gene in Canada extends to all materials containing that gene. Monsanto believes that the Canadian court ruling will affect the patent situation in other countries.

Different international agreements

When the TRIPs agreement was concluded, ministries for environment developed the Convention on Biological Diversity providing sovereign rights over genetic resources. In order to avoid a conflict between IPRs (private) and national rights, the CBD concluded that IPRs should be recognized. At the same time it was agreed that the International Treaty on Plant Genetic Resources for Food and Agriculture should conform to TRIPs.

Governments are now facing the challenge to design national laws that bring these three international agreements in line with national policies, such as those on rural development, food security, and indigenous peoples and their knowledge.

Many developing countries interpret the TRIPs requirements to have a minimal impact on their farmers, and have chosen the 1978 UPOV Convention. This model law provides a rather wider scope for "farmers' privilege" allowing seed saving and exchange. Some countries such as India refer to the term farmers' rights in this context, providing a very wide privilege and benefit sharing arrangement for farmers. Some other countries and organizations combine breeders' rights with aspects of biodiversity policy. The African Union is a good example with its African Model Law. Both these developments are meant to adapt breeders' rights to developing country conditions where most farmers use farm-produced seed instead of commercial seed from the formal sector, and where the implementation of strict intellectual property rights is considered neither feasible and nor fitting into the agricultural tradition.

Strengthening breeders' rights?

With the ongoing developments in biotechnology, the increased role of the patents may marginalize the breeders' rights system. Bilateral trade negotiations force countries to develop much stronger IPR laws than initially intended. For example Chile has to include patents for plant variety protection.

Breeders may also look for ambiguity in existing laws to obtain stronger protection, such as the case in China to protect breeding methods, hybrid varieties, etc even though varieties are specifically excluded from the patent system.

In a recent call to strengthen the breeders' rights system itself, it was suggested to put a limited time

frame on the breeders' exemption. Pioneer proposed that breeders should not be allowed to use protected materials from their competitors within the first 10 years of protection. The proposal was tabled during a seminar on IPRs following the 2004 ISF Annual Congress in Berlin, Germany. This proposal was opposed by the Limagrain, a French-based multinational seed company, who claimed that history shows that the breeders' exemption is essential for advances in breeding.

Choices ahead

The seed industry and governments that intend to develop this important sector need to be aware of these developments and could use the solutions developed in other countries. IPRs intend to favour investments in research and access to materials developed elsewhere and are thus important for the seed industry. It is important to balance the rights and obligations of the breeders. Strong rights may favour companies with strong research capacities making smaller seed companies dependent. Weak rights may turn away private investors and will require continued government investments to prop up the infrastructure of the public research.

IPRs can be considered a contract between the inventor and society in which the former obtains a monopoly right on the commercialization of the invention in return for benefits for society, such as disclosure, exemptions etc. Since societies differ in their stages of development, countries should be able to develop their own decisions regarding the extent of the rights that are optimal in their conditions and should not be pressed by other countries to adopt laws that are stronger than the internationally agreed minimum rights (e.g. TRIPs). In this process of balancing the rights, they should, however, take into account the benefits of harmonisation at the regional and international levels and its legal and technical implementation.

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African Seed Trade Association Fourth Annual Congress, Hammamet, Tunisia

The African Seed Trade Association (AFSTA) represents the seed industries in Africa and adjoining island states. It is a non-profit, non-political association with a mission to promote the development of seed industries and national seed associations, which will facilitate farmers' access to improved seeds in member countries. To date, the association has 58 members in 29 countries. In

2004, the following new members joined the association: Seed Association of Mali (ASSEMA), Mali; Seed Association of Guinea (APIDIA), Guinea; Seed Association of Morocco (AMSP), Morocco; Seed Co. International, Botswana; Espace Vert, Tunisia; and Wolf & Wolf Seeds Inc., USA

The 4th AFSTA Annual Congress was held 24-26 March 2004 in Hammamet, Tunisia and attracted 170 delegates from 38 countries. Apart from discussion on important topics during the technical sessions, the congress was an excellent opportunity for meeting, exchanging ideas and trading for the delegates.

Delegates included representatives from regional and international organizations: the International Seed Federation (ISF), the Organization for Economic Cooperation and Development (OECD), the International Seed Testing Association (ISTA), the Asia Pacific Seed Association (APSA), the African Organization for Intellectual Property (OAPI), the Food and Agriculture Organization (FAO), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), the German Agency for International Cooperation (GTZ), the International Union for the Protection of New Plant Varieties (UPOV) and the International Center for Agricultural Research in the Dry Areas (ICARDA).

Prior to the congress, a UPOV facilitated regional seminar on protection of new plant varieties was held on 23 March 2004. African speakers also presented the status of plant variety protection in their sub-region. OAPI presented the case of 16 countries in Western Africa. To date only Kenya, South Africa and Tunisia are members of UPOV from Africa.

The first topic of the congress was a comparative analysis of the African seed sector and the global seed industry. The African seed industry is in various stages of development in terms of regulations and the commercial seed market. It is suggested that each sub-region should develop a harmonized regulatory system for certification, plant-variety protection and phytosanitary measures; and establish a regional catalogue of plant varieties.

The second topic of the congress addressed the appropriate intellectual property rights for Africa. A strategy to establish a synergy between the traditional and commercial agricultural systems was proposed and discussed with an action plan for its implementation. The action plan discussed the introduction of farmers' privilege, as applied in

traditional agriculture, as a form of plant improvement in seed legislation, the recognition of farmers' rights as a component of intellectual property in terms of plant breeding, and the introduction of the access control to all improved plant genetic resources for food and agriculture.

The third topic dealt with Material Transfer Agreement (MTA) provided under the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) and its impacts on the African seed industry. The discussion enabled participants to better understand the MTA and its application to the seed industry.

The fourth topic focused on trade in biotechnology products from genetically modified crops and seeds in Africa. Countries that have acceded to the Cartagena Protocol on Biosafety must have biosafety systems in place to regulate transboundary movement of living modified organisms in order to comply with the protocol. African countries that had acceded to or signed the protocol by the end of February 2004 include Botswana, Burkina Faso, Cameroon, Egypt, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Malawi, Mauritius, Mozambique, Nigeria, Senegal, South Africa, Tanzania, Tonga, Tunisia and Uganda. Egypt, Malawi, South Africa and Zimbabwe have biosafety legislations in place whereas others are in the process of setting up such systems.

The fifth topic covered the seed market from African small-scale farmers' perspectives and factors influencing access to seeds. It was pointed out that apart from the socio-economic factors, harmonization of seed legislation significantly contributed to the improvement of the African farmers' access to quality seed, the basis of the development of African Agriculture.

The sixth topic presented the situation of the seed market in the North Africa sub-region. The seed trade between the countries in the sub-region are limited and it greatly depends on the external seed market. Harmonizing of seed legislations and creating/strengthening national seed associations are important to facilitate the seed trade in the sub-region.

In 2004, establishing and strengthening national seed associations is among the priorities of AFSTA. Funding is already available from the American Seed Trade Association, and FAO pledged to support the establishment and reinforcement of the national seed associations in Eastern Africa. AFSTA continues to organize technical training on seeds and biotechnology. It will strive to increase its membership for financial stability, and actively

participate in the harmonization process of seed legislation in the sub-regions. *AFSTA Secretariat, P. O. Box 2428 KNH, Nairobi, Kenya; Fax: ++254-2-727-861; E-mail: afsta@kenyaweb.com; Website: http://www.afsta.org*

Egyptian Seed Association Annual Conference, Cairo, Egypt

The Egyptian Seed Association organized an annual conference from 19-21 April 2004 in Cairo, Egypt under the theme, *Seed Industry: Future and Challenges*. The main purpose of the event was to exchange ideas and share experiences by bringing together the expertise of public/private seed companies, research institutes, universities and international organizations to enhance the performance of the national seed sector.

A total of 350 participants attended the meeting representing, the Egyptian, African and European seed companies as well as representatives of the People's Assembly, Ministries of Agriculture, Trade and Social Affairs, agricultural universities, agricultural research centers and NGOs from Egypt.

The participants made the following key recommendations at the end of the conference:

Future policy for the seed industry

- Develop a national seed industry strategy and enabling policy environment for the development of infrastructures and resources
- Speed up reforms and amendment of seed laws (Law No. 53 of 1966) for field crops according to national and international norms
- Limit the role of government to quality control and restrict its involvement in seed production
- Develop procedures for and adopt protection of IPRs to facilitate UPOV membership and protect breeders' rights
- Create the necessary mechanisms and legal framework for establishing seed companies
- Encourage seed companies to produce seed of all crops such as vegetables, fruits, medical and aromatic plants including self-pollinated and forage crops
- Encourage seed companies and agricultural research institutions to develop crop varieties of high productivity and good quality

Release and protection of crop varieties

- Establish variety release mechanisms providing equal opportunities for all seed companies
- Establish the necessary procedures to facilitate membership of all seed-related international organizations

- Limit the test period of field crops for registration to a period of two years
- Develop a system to register selected local varieties and encourage other parties to participate in the evaluation
- Encourage seed production of important crops to make Egypt as a major global seed supplier

Future approaches for development

- Strengthen the role of the private sector in seed production, marketing and export, and ensure collaboration between seed producers, research centers and universities through ESAS
- Ensure the development of new technologies in the seed sector applicable to all crops and varieties including GM crops
- Ensure that Egypt is represented in all seed-related meetings organized by international organizations
- Support and strengthen the gene bank and develop mechanisms for access to genetic resources by agricultural research institutions and seed companies and establish protocols to protect germplasm ownership
- Support linkages between research institutions, seed producing agencies and the Egyptian Seed Association
- Endorse the Code of Ethics developed by ESAS for the seed industry and ensure its enforcement

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International Seed Federation Annual Congress, Berlin, Germany

A total of 1284 delegates and accompanying persons representing the seed industry in 58 countries participated in the ISF Congress in Berlin on 24-26 May 2004. The regional seed associations from Europe, East Europe, Asia-Pacific, South America and Africa were also represented. Moreover, representatives from FAO, ISTA, OECD and UPOV also attended the congress. Twenty-four exhibitors displayed products ranging from software to sophisticated agricultural machinery.

Technical meetings were well attended. In the Breeders Committee, where among others, intellectual property and sustainable agriculture were discussed, two position papers were debated and presented to the general assembly for adoption. The Vegetable and Ornamental Section meeting drew large numbers and a position paper on the definition of terms describing plant reaction to pests and

pathogens was adopted. Guidelines for the handling of a dispute on essentially derived varieties of lettuce were also adopted.

The general assembly on 26 May 2004 adopted four position papers and amendments to the ISF trade and dispute settlement rules, which can be viewed on the ISF website. ISF welcomed the decision taken at the ISTA congress that allowed all ISTA accredited public and private company laboratories to issue orange certificates.

Given the complexity of the questions related to intellectual property protection of plant related inventions and access to plant genetic resources for plant breeding and varietal development, an international seminar on Protection of Intellectual Property and Access to Plant Genetic Resources was held on 27-28 May 2004. A total of 175 persons from the public and private sectors in industrialized and developing countries participated in the meeting. The proceedings of the seminar will be published later in the year. For more information, contact the ISF Secretariat.

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Global Status of Transgenic Crops in 2003

Global area of GM crops

In 2003, the global area of transgenic crops grew by 15% compared with 12% in 2002. The estimated global area of GM crops for 2003 was 67.7 million ha. The figure includes a provisional estimate of 3 million ha of GM soybean in Brazil, officially approved for planting for the first time. The 67.7 million ha of GM crops in 2003 was grown by 7 million farmers in 18 countries as compared to 6 million farmers in 16 countries in 2002. The increase in area between 2002 and 2003 of 15% is equivalent to 9 million ha.

During the eight-year period from 1996 to 2003, the global area of transgenic crops increased 40 fold, from 1.7 million ha in 1996 to 67.7 million ha in 2003, with an increasing proportion grown by farmers in developing countries. Almost one-third (30%) of the global transgenic crop area of 67.7 million ha in 2003, equivalent to over 20 million ha, was grown in developing countries where growth continued to be strong. The absolute growth in GM crop area between 2002 and 2003 was almost the same in developing countries (4.4 million ha) and industrialized countries (4.6 million

ha), with the percentage growth more than twice (28%) in the developing countries of the South compared with the industrialized countries of the North (11%).

Global value of GM crops

In 2003, the global market value of GM crops was estimated to be \$4.5 to \$4.75 billion, having increased from \$4 billion in 2002 when it represented 15% of the \$31 billion global crop protection market and 13% of the \$30 billion global commercial seed market. The market value of the global transgenic crop market is based on the sale price of transgenic seed including any technology fees that apply. The global value of the GM crop market is projected at \$5 billion or more, for 2005.

Despite the on-going debate in the European Union, there is cause for cautious optimism that the global area and the number of farmers planting GM crops will continue to grow in 2004 and beyond. Taking all factors into account, the outlook for the next five years indicates continued growth in the global area of GM crops to approximately 100 million ha, with up to 10 million farmers growing GM crops in more than 25 countries. *Source: CropBiotech Update Special Edition January 14, 2004*

CONTRIBUTIONS from SEED PROGRAMS and PROJECTS

In this section we invite national seed programs, projects, universities, regional or international organizations to provide news about their seed related activities.

Future Harvest Consortium to Rebuild Agriculture in Afghanistan (FHCRAA)

A CGIAR Future Harvest Consortium to Rebuild Agriculture in Afghanistan (FHCRAA) was established with a USAID grant in 2002. ICARDA is the lead center for the Consortium where several achievements have been made in forming a strong basis for the development of agriculture in Afghanistan.

The FHCRAA was able to attract funding for four projects under RAMP for a period of three years starting in 2004. The four projects focus on: (a) Demonstration and technology transfer; (b) Village-based seed enterprise development; (c) Potato seed production; and (d) Protected agriculture. The RAMP projects operate in five main crop production provinces of Afghanistan, namely; Ghazni, Helmand, Kunduz, Nangrahar and Parwan.

Demonstration of new agricultural technologies

The overall objective of the project is to increase

agricultural productivity and rural incomes by demonstrating available improved technologies in farmers' fields, focusing on improved varieties of field and vegetable crops that are adapted to local conditions, improved irrigation and appropriate crop management practices. The demonstration fields are designed to show farmers the advantages of improved varieties and crop management practices, compared with their traditional practices. The demonstrations will include a limited number of very specific technologies so that the farmers can easily understand the packages.

A total of 1000 on-farm demonstrations will be conducted in 27 districts within the five target provinces. The demonstrations will focus on six principal crops such as wheat, rice, mung bean, potato, onion and tomato, and key inputs and management practices, including improved varieties, fertilizers, seed rates, weed control, irrigation practices, transplanting (rice, onion), etc.

Establishment of village-based seed enterprises

The village seed enterprise program will help farmers to gain rapid access to quality seed of the most profitable adapted varieties. It is planned to develop a total of 20 village-based seed enterprises in five target provinces. Each enterprise is expected to produce at least 100 tonnes of quality seed per year. When all enterprises are operational this amounts to more than 2000 tonnes of quality seed each year benefiting at least 40,000 farm families annually.

To implement the project, potential seed production and marketing units were identified and a training course on seed production technology and enterprise management was organized for technical staff of FHCRAA, the Ministry of Agriculture and Livestock, NGOs, etc. in February 2004. Moreover, two follow-up courses were conducted in Jalalabad and Kunduz for farmer seed producers in May 2004 to train farmers on seed production technology and enterprise management issues for operating small seed enterprises at the local level.



Farmers visiting a seed multiplication field in Afghanistan

Seed potato production and marketing

The project aimed at quality seed multiplication and marketing to increase potato production in Afghanistan. The main activities include:

- Enhance the capacity of the tissue culture laboratory in Kabul; provide equipment and train personnel in screen house management
- Establish and operate a variety selection system
- Establish basic seed production both in the laboratory and in the field
- Train farmer seed producers in selected provinces, supply them with disease-free seed and provide technical supervision, field demonstrations, etc.
- Produce seed through the informal system and seed producers' groups
- Construct and adapt seed storage facilities for participating farmers in higher elevations and cold storage for seed producers in the plains
- Design a seed marketing and promotion plan among seed producers' groups and develop seed marketing infrastructure in potato growing areas
- Establish contact between farmers in the different provinces and districts through cross visits and field days
- Continuously move seed between districts to reduce storage costs



On-farm seed potato production in Afghanistan

Introducing protected agriculture for cash crops

The project will promote the adoption of low-cost and sustainable protected agricultural systems to produce high value crops, using marginal or otherwise non-productive lands and water more efficiently, by establishing a central demonstration and training site in Kabul and simple greenhouse structures at selected pilot sites with participating farmers. The activities include:

- Establishment of a protected agriculture center at the Badam Bagh Research Station in Kabul for demonstration, technical backstopping and training
- Introduction of plastic house facilities and production practices to farmers in 28 selected pilot sites

- Training programs in plastic house installation, preparation and management (including plug trays), and in integrated production and protection management (IPPM)
- On-the-job training of farmers, national agricultural research staff, extension agents and technicians in Afghanistan and in leading farms abroad
- Production of training manuals and technical booklets in the local language
- Provision of specifications, technical advice and, where necessary, equipment to a local plastic house fabrication workshop

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National Seed Association Established in Algeria

In line with its policy to promote national seed associations in Africa, the African Seed Trade Association, with the financial support of the American Seed Trade Association (ASTA), is implementing a project to establish new seed associations or strengthening the existing ones to efficiently achieve their objectives.

Under this project, the Algerian Seed Association (ASA) was established on 14 April 2004 during a one-day founding meeting in Algiers where the board members were elected, the constitution and bylaws adopted and short-term action plans were defined. Representatives of the Ministry of Agriculture attended the meeting and agreed to work with the association to create an enabling environment for the private sector participation in the national seed industry. AFSTA was represented by its president who at the meeting stressed the importance of harmonization of the seed regulations in the countries of North Africa sub-region.

Under the same project, a two-day training program on management of a seed association will be organized for members of AFSTA in Nairobi, Kenya. The AFSTA Secretariat will inform members about the dates and details of the course.
Source: E-Review, African Seed Trade Association, April 2004

Plant Variety Protection Enacted in Turkey

In 2004, a new law on the protection of new varieties and plant breeders' rights has been enacted in Turkey. Moreover, related directives have been prepared for implementation. The law provides a good opportunity for domestic or foreign plant breeders and seed companies to increase their

efforts to register new and better varieties. These developments will positively affect the national seed sector including the cut flower business. At present, most of the cut flower varieties are not available in Turkey due to lack of variety protection.

Since the mid 1980s, there is remarkable progress in the Turkish seed industry. To date, there are over 120 private seed companies dealing mainly with seed of hybrids, vegetables and forage crops. A new seed law has been prepared and submitted to the Turkish Parliament to replace the existing ones. The law covers new developments and issues in the seed sector such as genetic resources conservation, organic seeds, GMOs, etc. The present reforms in the seed sector will enable the breeders, producers and farmers, the main players of the seed sector, to be organized and represented under one umbrella.

At present several activities are undertaken to increase the production and use of certified seed. The main objective is to increase production of hybrid seeds of vegetables and increase use of certified seed of wheat and barley. *K. Yalvac, Seed Division, General Directorate of Agricultural Production and Development, Ministry of Agriculture and Rural Affairs, Milli Mudafaa Caddesi No 20 Kat, 8/814 Kizilay, Ankara, Turkey;*
E-mail: kyalvac@tarim.gov.tr

Modern Tissue Culture Laboratory and Greenhouse Facility Established in Syria

The General Organization for Seed Multiplication (GOSM) through a grant from the Japanese Government has established a modern tissue culture laboratory, greenhouse and quality control facility in Aleppo. Sumitomo Company and System Science Consultants Inc. made the design and supplied the equipments for all facilities under the supervision of Japan International Cooperation Agency, while GOSM was responsible for civil and construction works on the site. The project is aimed at enhancing local capacity to produce disease-free high quality potato seed reducing seed imports to the country.

The facility is located on a 10 ha site, 4.75 ha of which is used for the tissue culture laboratory, greenhouse and quality control facilities. The tissue culture laboratory is equipped with modern sterilization, water purification, media preparation, culture and growth rooms for proper incubation and growth of tissues and in vitro plants to produce nucleus materials for transfer to the greenhouse.

The greenhouse facility has 3240m² area of three equal separate rooms fitted with state-of-the-art



Greenhouse facility for potato seed production in Syria

equipment. The quality control facility has an area of 300m² of 8 equal rooms fitted with necessary equipment. The total project cost was estimated at about US\$ 4 million.

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Crop Varietal Releases Across CWANA Region

ICARDA distributes improved germplasm through international or specialized nurseries for evaluation or use by NARS. The germplasm supplied by ICARDA is either used directly for selection, crossing or both to develop crop varieties adapted to local farming conditions. Such close partnership between ICARDA and NARS led to the development and release of several crop varieties currently used by farmers across the CWANA region. The year 2003/2004 appeared to be successful in terms of variety releases across the region as some excerpts from *The Week at ICARDA* are reported below.

Nile Valley Region

The Ethiopian National Variety Release Committee released two lentil varieties, '*Teshale*' (ILL 7978) and '*Alem Tena*' (ILL 7980). These varieties are erect, resistant to rust and wilt root-rot complex, high yielding, and have red cotyledons which are preferred by the consumers. '*Teshale*' produces an average of 2.2 tonnes ha⁻¹ compared to 1.6 and 1.7 tonnes ha⁻¹ from the improved variety '*Adaa*', and the best local check, respectively. '*Alem Tena*' produces an average of 2.5 t ha⁻¹ compared to 2.2 tonnes ha⁻¹ from the improved variety '*Alemaya*' and 2.3 tonnes ha⁻¹ from the best local check.

'*Teshale*' and '*Alem Tena*' were introduced from ICARDA international nurseries in 1996. Ethiopia has released seven varieties of lentil to date, all of which originated from ICARDA-supplied germplasm.

North Africa Region

New lentil varieties were also released in Morocco. '*Chaouia*' and '*Abda*' both have high levels of rust

resistance, produce around 2 tonnes ha⁻¹ and have large cream-colored seeds with yellow cotyledons, which are preferred by consumers. The new varieties mature early which allows them to escape *Orobanche* attacks. '*Chaouia*' was developed from a cross between '*Laird*' and '*Precoz*' (ILL4605) and '*Abda*' was a derivative of L-24 and '*Precoz*'.

West Asia Region

Jordan

Five new cereal varieties were released in Jordan by the National Variety Release Committee at its meeting on 29 March 2004, at the National Center for Agricultural Research and Technology Transfer (NCARTT) in Baqa'a, Jordan. The characteristics of the wheat and barley varieties and their performance over the last three years at experimental stations and farmers' fields were presented to the committee.

Bread Wheat:

1. '*Amman*' (Tsi/Vee'S) originated from ICARDA (RWYT-MRA trial in 1989/90)

Durum Wheat

2. '*Um AIs*' ('Omrabi 6') originated from ICARDA (RWYT-trial in 1988/89)

Barley

3. '*Uta'a*' (Roho/A.Abiad//6250/1161) two row introduced from ICARDA (BYTLR-MW trial in 1995/96)
4. '*Yarmulke*' (Esp/1808-4L//Harmal-02) two row introduced from ICARDA (BYTLR-MW trial in 1995/96)
5. '*Throe*' ('Kathraia') six-row introduced from Cyprus in 1996/97

The varieties are currently under large-scale seed multiplication and will be distributed to farmers in the 2005/06 crop season.

Yaser Momany, NCARTT, Baq'a, Jordan; E-mail: momany55@yahoo.com

Iran

In February 2004, a kabuli chickpea variety was released in Iran under the name '*Arman*' (FLIP90-96), after years of testing under different growing conditions both on the station and in farmers' fields. '*Arman*' has a 56% yield advantage over presently grown varieties such as '*Bivanij*', '*Jam*', and '*Hashem*', a 100-seed weight of 36g, an erect growth habit, and a high protein content of 26.5%. '*Arman*' is also resistant to *Ascochyta* blight and is recommended for growing in the mild- and moder-

ately cold-winter areas of Gachsaran, Golestan, Ilam, and Kermanshah provinces.



Assessing performance of chickpea variety Arman in Iran

Central Asia and Caucasus Region

Azerbaijan

The State Commission on Testing and Protection of Breeders' Achievements has released two bread wheat varieties, 'Azametly-95' and 'Nurlu-99', from CIMMYT-ICARDA-Turkey nurseries supplied to Azerbaijan. During four year trials, these varieties demonstrated good resistance to diseases, including yellow rust, and their suitability for irrigated conditions in lowlands and foothills. In addition to maturing early, both varieties have a potential productivity of 7-8 tonnes ha⁻¹. About 20 tonnes of seed will be distributed to farmers in different areas of Azerbaijan in 2004.

Kyrgyzstan

'Jamin', a facultative wheat variety, has been released as a spring crop for mountainous areas in Issyk-Kul and Naryn provinces in Khyrgyzstan. Besides maturing early and producing high yields, this is the first facultative wheat variety released in Kyrgyzstan since 1978.

With a productivity potential of about 6 tonnes ha⁻¹, it is resistant to yellow rust and, therefore, may soon replace 'Intensivnaya' (released in 1978), which has become susceptible to yellow rust but is still grown on about 50% of the total wheat area in Kyrgyzstan. About 70 tonnes of 'Jamin' seed will be produced in 2004.

Georgia

Three new varieties of vetch were released in Georgia. All three varieties are rich in digestible dry matter, which makes them particularly suitable as green fodder. Since these varieties are cold tolerant, they can be planted in late autumn or early winter.

Vicia dasycarpa, variety 'Abigi', has dark green leaves with a stem height of about 86.6 cm. It flowers in spring and produces about 18 pods per plant (0.16 kg seeds). In dry areas, 'Abigi' produces an average of 6.2 tonnes ha⁻¹ of hay and its vegetative period lasts between 170 and 175 days.

Vicia narbonensis, variety 'Abika', has dark green leaves and a stem height of about 92cm. It flowers in spring, and produces about 12 pods per plant (0.11 kg seeds). 'Abika' yields 7.3 tonnes ha⁻¹ of hay and 0.54 tonnes ha⁻¹ of seed, and its vegetative period is between 150 and 155 days.

Vicia sativa, variety 'Abiza', has a short stem of 68.7 cm. It produces dark green leaves and flowers in spring. 'Abiza' produces 21 pods/per plant (0.17 kg seeds) and yields 9.3 tonnes ha⁻¹ of hay. The vegetative period is between 170 and 175 days.

HOW TO

In this section we provide technical/practical information that seed sector staff may find useful. The guidelines are simple for technical staff involved in seed production and quality control to follow.

How To No 29: Auditing of a Seed Testing Laboratory

Quality assurance is a process of planning, acting, checking and adjusting. ISTA defines audit as 'the periodic check which a laboratory must perform to ensure that all aspects of its quality system are effective, fully implemented and adhered to by its staff at all levels'.

For a seed testing laboratory to be accredited, it needs to establish a quality system and to keep the accreditation valid, it needs to prove that the system is being implemented and continuously improved. The practical evidence of successful establishment, implementation and improvement of a quality system is the audit report. Thus, obtaining and maintaining the status of accreditation depends on the results of audit reports.

How to audit

According to the Seed Testing Laboratory Accreditation Standards of ISTA, audits must be performed in order to verify the laboratory's testing capability and must address all elements of the quality system.

Auditing starts by setting and communicating the timetable, the component of the system to audit, the list of people to meet and the documents to inspect; being flexible, if necessary, to make changes in the procedures. Using the quality system based on which the laboratory was accredited, the audit checks the performance of the people, facilities and equipment through interviews, verification of test reports, information on calibration of equipment, error surveys, customer complaints and the preventive/corrective actions taken during the period audited. The audit report includes a full record of

how, when and what has been inspected and recorded in such a way that, if necessary, it can be repeated by another person. Both positive and negative results should be fully recorded, discussed with the management, timely corrective actions requested and the potential effects of deficiencies discovered should be reported to the clients.

Who performs the audit?

Any accredited laboratory with an established quality system must have an audit schedule or procedure on the basis of which the laboratory management requests the quality manager to plan and ask an independent and qualified person to carry out the audit.

Types of audit

There are two types of audit: internal and external. A qualified person, preferably from a different section within the same laboratory, may carry out internal audits. In the ISTA accreditation standard, such audits must be part of the quality system and are performed at least annually. The formal external ISTA audits form the basis for initial acceptance of the laboratory for accreditation. The audits are subsequently conducted every three years to maintain the status of accreditation. External auditors assigned by ISTA carry out the initial audits and report to the ISTA secretariat. The external auditors consist of a quality system specialist, who leads the mission and look at the completeness and integrity of the system, assisted by a technical auditor to look at the technical details of the different components within the systems.

The result of the audit and the appropriate corrective actions taken thereafter determine whether accreditation status is granted and maintained thereafter for a laboratory. *Abdoul Aziz Niane, Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria; E-mail: a.niane@cgiar.org*

RESEARCH NOTES

Short communication of practical oriented research or relevant information in agriculture or seed technology are presented in this section.

Seed Production of Indigenous Rangeland Forage Species in the Sultanate of Oman

by

S. K. Nadaf, S.M. Al-Farsi and S.A. Al-Hinai¹

Bulk seed multiplication of two rangeland forage species viz. *Cenchrus ciliaris* L (UAE Accession No. MAF-120) and *Coelachyrum piercei* Benth (UAE Accession No. MAF-116) was entrusted to the Seed and Plant Genetic Resources Laboratory

during November 1999 under Phase II of the Arabian Peninsula Research Program (APRP) of ICARDA. Initially 6 g of *Cenchrus ciliaris* L and 8 g of *Coelachyrum piercei* Benth were received for seed production. Seed multiplication was carried out at the Agriculture Research Station in Sohar under drip irrigation from March 2000 to February 2002. Total seed yield collected through six harvests was 13.6 kg and 12.6 kg, respectively for *C. ciliaris* and *C. piercei* in a span of 600 days. It has been observed that both forage crops produced comparatively more seed yield in summer than in winter season. The studies clearly indicated that seed production of *Cenchrus* and *Coelachyrum* is possible throughout the year in Oman. Non-synchronous formation of panicles and early shattering of seed were the problems encountered during seed harvesting in both grass species. New experiments have been initiated to further investigate these problems.

Introduction

The Sultanate of Oman has a large area of rangelands in the Arabian Peninsula especially in Dhofar Jabal areas in the southern part of the country. The indigenous forage species play an important role in the long-term sustainability of rangelands because of their adaptation to the environment. They could be alternative feed resources compared to exotic or imported forage species with high demand for scarce water resources. However, the availability of seed of indigenous forage species is a major limiting factor. More than 60 germplasm accessions of different indigenous forage species have been collected under Phase I of APRP (ICARDA) from 1998-2001. The collections represent part of the genetic diversity of rangeland forage species used by grazing animals. However, few forage species (e.g. *C. piercei*) have been investigated and found capable to emerge under adverse conditions and produce good quality forage as compared to Rhodes grass. The seed of indigenous rangeland forage species have to be multiplied in large quantities before they are evaluated for forage productivity under the existing irrigation system or for reseeded in degraded rangelands.

Large-scale seed production of perennial forages such as Rhodes grass, Kikuyu grass, Prairie grass etc. is carried out under sprinklers in countries like Australia, Canada and the United States. In India, seed production of grass species is carried out under rainfed conditions in established crop stands. In Oman all forage seed of grass species were hitherto imported from abroad. There was no research conducted to assess the possibility to produce seed of any forage species. Therefore, the program was initiated to explore the prospects of seed production

of two indigenous rangeland grass species viz. *C. ciliaris* and *C. piercei* under the hot arid climatic conditions of Oman.

Materials and Methods

Seed multiplication of two rangeland forage species viz; *C. ciliaris* (UAE Accession No. MAF-120) and *C. piercei* (UAE Accession No. MAF-116) were entrusted to the Seed and Plant Genetic Resources Laboratory in November 1999 under Phase II of APRP of ICARDA. Accordingly, 6 and 8 g of *C. ciliaris* and *C. piercei*, respectively were supplied to Seed and Plant Genetic Resources Laboratory where seed multiplication was carried out at the Agriculture Research Station in Sohar under drip irrigation from March 2000 to February 2002.

The experiment was planted in loam soil (sand (48.3%), silt (31%), clay (19.7%) and pH of 7.7. The soil has soluble cations (med./100g) of 8.8, 9.8, 1.7 0.6 and 20.9, for Ca, Mg, Na, K and SEC, respectively. The soluble anions (med.100 g) was 0.05, 31.6 and 0.1 for N%, av. (PPM) and av. (med./100g).

From each species, one to two seeds were sown at 2.5 cm depth in loam soil at drip points spaced at 50 cm distance in lines spaced at 50 cm apart. Each species had 20 drip lines with 50 drip points to accommodate 1000 plants in an area of 250 m². About 10 to 15 granules of systemic insecticide, carbofuran (Furadan) were scattered around each hill to protect the seed from ants. The crop was fertilized with 150 kg each of N, P₂O₅ and K₂O ha⁻¹ year⁻¹ in the form of urea, triple super phosphate and potassium sulphate, respectively. The entire amount of phosphorous and potassium fertilizers were applied after seedling establishment while 1/3 of N was applied in two split doses i.e. 1/2 N with P and K or after each harvest and the remaining 1/2 N at flag leaf emergence.

The crop was initially irrigated very lightly with water of about 0.8 dS/m (15 minutes/day) until germination. The duration of irrigation was increased by 5 minutes every week for one month. Afterwards the crop was irrigated daily for 20 to 30 minutes.

Although the initiation of germination was noticed in few hills from the fourth day, in most of the hill points germination was observed only during the second week after sowing. The panicle initiation started first in *C. piercei*. The two species took about 15 days to attain 50% heading from the day of panicle initiation. The crops were physiologically mature in about three months i.e. during the last

week of June 2000. The mature seeds were manually harvested from each plant by grasping the panicles from 4 to 15 July 2000, when the first cut was made at a height of 10 cm from ground level. The second crop came to heading within 25 to 30 days and was harvested during the second week of October 2000. The two species appeared to produce tillers continuously and they were harvested for seed whenever the species showed more than 70% maturity. The data on seed yield (collected) was recorded after cleaning the harvested produce.

Results and Discussion

The details of germination, plant stand, days to 50% heading and maturity, and seed yield (collected with husk) in each harvest for *C. ciliaris* and *C. piercei* are given in Tables 1 and 2, respectively.

In the first harvest, the highest seed yield was collected from *C. ciliaris* (2.8 kg) followed by *C. piercei* (2.2 kg). Subsequent seed harvests were of low magnitude but consistent with plant stand with respect to indigenous grass collections (Tables 1 and 2). Germination of 0 to 4% was observed in each species in the initial test carried out using husked seed immediately after harvest while it was between 27 and 40% after four months of storage indicating seed dormancy.

In a span of about 600 days, the total seed yield was 13.6 kg and 12.6 kg for *C. ciliaris* and *C. piercei*, respectively. It has been observed that summer crops produced comparatively more seed yield than in the winter season in both grass species. These studies clearly demonstrated that seed of grass species such as *Cenchrus* and *Coelachyrum* can be produced throughout the year in the Gulf climate of Oman.

Problems encountered during seed multiplication

Both grass species are non-synchronous in panicle initiation of tillers. Moreover, shattering of seed from panicles of earlier tillers was high before panicles from late tillers reach maturity. It was difficult to assess a proper harvesting period for panicles of all tillers at one time. Therefore, harvesting has to be started either when earlier formed panicles attain maturity showing signs of shattering (which would indirectly delay cutting time) or all at one compromising time losing some immature seed of late emerging panicles. Furthermore, some mechanism should be developed to collect the shattered seed from the ground.

Although shattering of earlier panicles was less noticed in *C. piercei*, tillering appeared to be continuous throughout the growing period with no sign of cessation. This made it very difficult to decide the optimum harvesting time.

Future aspects of research in seed multiplication
The seed multiplication exercise was successful in raising the crops and producing satisfactory amounts of seed from two rangeland forage grass species which are germplasm of UAE collections. It has been planned to carry out the following activities with main objectives to:

- Investigate the effect of irrigation systems (drips or sprinklers) to decide which system to be used in commercial seed production of indigenous rangeland forage species
- Extend large scale seed production in different sites under an appropriate irrigation system

based on activity (1) for each indigenous rangeland forage species

- Distribute seed of selected indigenous rangeland forage species for performance testing in the farmers' fields (on-farm trials)
- Distribute the seed of selected indigenous rangeland forage species for reseeding in the degraded rangelands

Experiments were already initiated in March 2003 under Phase II of APRP-ICARDA to investigate the appropriate stage of maturity for harvesting seed of such rangeland forage species.

Table 1. Germination (%), plant stand, days to 50% heading and seed yield (kg) at each harvest of *Cenchrus ciliaris* L. during the year 2000-2002.

Number of harvests	Germination in the field (%)	Plant stand	Days to 50 % heading	Days to maturity	Seed yield (husked) kg	Germination (at harvest)	Germination (4 months after harvest)
I	70	65	65	105	2.8	0-3	27
II	-	60	32	72	2.3	0-4	33
III	-	45	55	90	1.9	0-2	28
IV	-	40	42	75	1.4	0-2	32
V	-	35	38	70	1.3	0-2	35
VI	-	25	40	70	1.4	0-2	40
VII	-	25	45	85	1.2	0-3	38
VIII	-	25	38	72	1.3	0-2	42
Seed yield (kg)	-	-	-	-	13.6	-	-

Table 2. Germination (%), plant stand, days to 50% heading and seed yield (kg) at each harvest of *Coelachyrum piercei* L. during the year (2000-2002).

Number of harvests	Germination in the field (%)	Plant stand	Days to 50 % heading	Days to maturity	Seed yield (husked) kg	Germination (at harvest)	Germination (4 months after harvest)
I	65	50	67	110	2.2	0-3	40
II	-	45	25	68	2.8	0-3	38
III	-	35	42	75	1.8	0-3	35
IV	-	32	40	60	1.5	0-2	37
V	-	30	44	65	1.1	0-4	41
VI	-	20	44	62	0.9	0-2	38
VII	-	20	40	70	1.2	0-2	37
VIII	-	15	42	64	1.1	0-2	35
Seed yield (kg)	-	-	-	-	12.6	-	-

¹Address: Seed and Plant Genetic Resources Laboratory, Agriculture Production Research Center, Ministry of Agriculture and Fisheries, P.O. Box 50, PC 121, Oman

MEETINGS and COURSES

Announcements of meetings, seminars, workshops and training courses appear in this section. Please send us national, regional or international announcements for workshops, seminars and training courses organized in your country for inclusion in the next issue.

Conferences

Asian Seed Congress 2004, 13-17 September 2004, Seoul, South Korea. The Asia and Pacific Seed Association (APSA) will organize the congress in collaboration with the Korean Seed Association from 13-17 September 2004 in Seoul, Korea. The congress offers an opportunity to meet and interact with practically key people in the glob-

al seed industry. About 500 delegates from more than 50 countries are expected to participate. The 2004 Congress will address the following issues: (i) FAO treaty on plant genetic resources; (ii) PVP issues -new perspectives; (iii) Seed industry in Korea; (iv) ICRISAT and seed industry in Asia; (v) Seed enhancement for healthy seedlings; (vi) Organic seeds; and (vii) Forage seed for animal production in Asia. For more information contact: APSA Secretariat, P.O. Box 1030, Kasetsart, Post Office Bangkok 10903, Thailand; Fax: ++66-2-940-5467; E-mail: apsa@apsaseed.com; Website: <http://www.apsa.com>.

5th ISTA - SHC Seed Health Symposium, 10-13 May 2005, Angers, France. The list of topics include: (i) Innovations in seed health testing; (ii) New diseases and emerging seed borne pathogens; (iii) Methods of standardization and evaluation of comparative tests; (iv) Seed contamination from infected plants; (v) Chemical and physical seed treatments; (v) Seed health and the international movement of seeds; and (vi) Quality assurance in seed health testing. For more information contact: Véronique Binoit, GEVES-SNES, Rue Georges Morel, BP 24, 49071 Beaucouzé, Cedex- France; Tel: ++33-2-451225803; Fax: ++ 33-2-47225801; E-mail: veronique.binoit@geves.fr.

AFSTA Seed Congress 2005, 16-18 March 2005, Yaoundé, Cameroon. The congress will be held 16-18 March 2005 in Yaoundé, Cameroon. For more information contact: AFSTA Secretariat, P O Box 2428 KNH, Nairobi, Kenya; Tel: ++ 254-2-727-860; Fax: ++ 254-2-727-861; E-mail: afsta@kenyawe.com. Website: www.afsta.org.

LITERATURE

Literature, books and journal articles of interest to readers are presented here. Please send list of seed publications on policy, regulation and technology to the Editor for inclusion in *Seed Info*.

Newly Released ISTA Publications

International Rules for Seed Testing, Edition 2004



The International Rules for Seed Testing is approved and amended at ISTA Ordinary and Extraordinary Meetings on the basis of advice of the ISTA Technical Committees. The 2004 edition includes the latest changes approved by the ISTA Extraordinary Meeting in 2003.

The Edition 2004 (valid from 1 January 2004) is available in a binder and includes the Annex to Chapter 7 (Price: CHF 365).

Don, R (ed.). 2003. ISTA Handbook for Seedling Evaluation. The handbook is a valuable guide with detailed instructions and illustrations, and is vital if the principles of seedling evaluation are to be applied uniformly. The 3rd edition includes many tropical, subtropical, flower and tree species (Price: CHF 250; 232 pp.)

Leist, N. and S. Kramer (eds.). 2003. ISTA Working Sheets on Tetrazolium Testing, first Edition: Volume I-Agricultural, Vegetable and Horticultural Species (Price: CHF 250; 176 pp.); and **Volume II- Tree and Shrub Species.** (Price: CHF 250; 153 pp). The Tetrazolium Working Sheets volume I and II include detailed and standardized description to conduct and evaluate tetrazolium tests for determination of viability from agricultural, horticultural and forest seed. All ISTA publications are available from ISTA Secretariat on-line at: website: <http://www.seedtest.org>

WANA Secretariat. 2004. WANA Catalogue of Crop Varieties



The WANA Catalogue of crop Varieties, published under the umbrella of the WANA Seed Network, compiles the list of varieties released in member countries and their synonyms. For hard copy please contact: WANA Seed Network Secretariat, Seed Unit, ICARDA,

Aleppo, Syria; Fax: ++963-21-2213490; E-mail: z.bishaw@cgiar.org.

Training Handbook on Property Rights. The Institute of International Agriculture, Michigan State University, has launched a new online training handbook on intellectual property rights. The objective of the book is to provide basic information regarding the management of intellectual properties concerning the types of agreements used in transferring intellectual properties from one organization to another or one researcher to another. It is also intended to provide awareness of the important sections of agreements and provide a base for organizations in various countries to develop standard intellectual property transfer agreements that are in accordance with the respective country's laws and the organization's policies.

The book can be downloaded from the website <http://www.iaa.msu.edu/iprworkbook.htm>.



Emerging Seed Testing Technology

Maxx Automation AB has developed the SeedsScanner 2003 using the latest technology to reduce the manual work involved in the number determination of other seeds in cereal species by 90%. The scanner improves the efficiency and working environment and minimizes the large amount of routine manual work, reducing the quantity of seeds to be inspected. The species include wheat, barley, rye, oats and triticale.

The SeedsScanner 2003, analyses seed samples and divides them into two fractions. The larger fraction contains the most uniform and typical seeds, and the smaller fraction contains non-typical seeds. The

larger fraction is considered to be free from contaminants and is not analysed by visual inspection. Any seed kernels from other species that may be present in the sample will be found in the smaller fraction, and only this fraction will be further analysed. Therefore, only about 5-10% of the seeds in the original sample need manual examination. A robot handles the samples and the samples in containers in the machine are treated gently, avoiding any change in the nature of the original samples. The machine has a self-cleaning function and a low noise level, and has been designed to meet quality assurance requirements. Windows 2000 is used as the operating system. The decision algorithm is based on linear discriminant analysis and the classification is based on the statistical analysis of 22 morphological, color and textural features extracted from seed kernel images. The image analysis system can be used for statistics and for sorting by length, width, area and color.

The SeedsScanner 2003 is operating as a tool for the determination of other seeds by number in cereal species at the Seeds Department of Norwegian Agricultural Inspection Service, the Swedish Seed Testing and Certification Institute and Analycen Nordic AB, Sweden. In Sweden the SeedsScanner 2003 is used for testing seed lots prior to cleaning which is useful for large cereal seed companies with own certification laboratories. The SeedsScanner is used to work both with: (i) cleaned seed samples for final certification purpose, and (ii) unprocessed seed samples for testing the quality of seed lots prior to cleaning in seed plants.

If the quality of the unprocessed seed sample is known seed lots with difficult problems will be rejected quickly for seed purpose. In some countries (e.g. Sweden), the unprocessed seed samples can be analyzed in the laboratory to determine the percentage of cleaned seed, germination and admixtures with difficult other crop/weed seeds to calculate payment to contract growers. Tests for detecting admixtures in the seed samples has to be done accurately and very fast particularly during the peak season. SeedsScanner 2003 will provide better solutions for accuracy and flexibility. For more information contact: Jaan Luup, Maxx Automation AB, Alsikegatan 4, 753 23 Uppsala, Sweden; Tel: ++46-18-155560; Fax ++46-702-244126; E-mail: jlp@elektronik.st; Website: <http://www.maxx.se>.

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Fax: ++ 963-21-2213490, 2225105, 2551860; E-mail: z.bishaw@cgiar.org; Website: <http://www.icarda.org>

cgiar.org/seed_unit/SeedUnit/home.htm

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