



SEED INFO

Official Newsletter of the WANA Seed Network



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EDITORIAL NOTE

Seed Info aims to stimulate information exchange and regular communication among seed staff in the Central and West Asia and North Africa (CWANA) region. The purpose is to help strengthen national seed programs and thus improve the supply of quality seed to farmers.



The WANA Seed Network corner provides information on the ECOSA 2010 Seed Conference. It covers highlights of the General Assembly, Technical Workshop and Seed and Seed Technology Fair held from 28–31 October 2010 in Istanbul, Turkey. Members and representatives of ECO member countries from Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, Turkey, and Uzbekistan attended the conference. Members of the Afghanistan Seed Association (ANSOR), Seed Association of Kyrgyzstan (SAK), Seed Association of Tajikistan (SAT), Turkish Seed Union (TÜRK TOB) and its Sub-Unions (TSÜAB, etc.), and the recently formed Seed Association of Pakistan (SAP) participated in the conference. ECOSA members, representatives from the ECO Secretariat, FAO, ICARDA, OECD, ISTA, UPOV, and the public and private seed sectors from various countries also attended the conference.

In the **NEWS AND VIEWS** section, we present the second part of the article on ‘Reconciling UPOV and integrated seed systems’ by Niels Louwaars from Wageningen University, The Netherlands. Part 1 introduced the two intellectual property rights (IPR) systems that currently exist in the seed industry. Part 2 of the article aims to reconcile development, food security and agro-biodiversity policies and their effect on seed systems, leading to approaches integrating seed systems development with IPR that countries have to implement following the WTO and bilateral trade agreements. This section continues with an analysis of seed systems and the possible solutions to the problems that may arise.

There is news from regional and/or international organizations such as the African Union Commission (AU), the International Union for the Protection of New Varieties of Plants (UPOV) and the Association of Official Seed Analysts (AOSCA). AU reports on a case study initiated on integrated seed system development

across Africa under the African Seed and Biotechnology Program. UPOV reports on the outcome of its ordinary assembly meeting where key decisions were made regarding membership, approval of guidelines, etc. and AOSA Rules for Seed Testing. There is also news about a newly enacted biosafety law in Turkey.

The section on **SEED PROGRAMS** includes news from Afghanistan, Iran, Pakistan and Turkey. The news from Afghanistan is the enactment of the seed law whereas the news from Iran covers the release of barley varieties developed from germplasm provided by ICARDA through the international nurseries network. The news from Pakistan and Turkey focuses on the formation or role of existing seed trade associations in strengthening the national seed industry. There are also some highlights on the seed industry in Turkey.

The **RESEARCH** section aims to capture information on adaptive research or issues relevant to seed program development in the region and beyond. This issue features an article entitled ‘Redesigning a purity testing system: development of an ergonomic, high-vision, continuous-flow seed inspection system’ by Adriel Garay et al. from Oregon State University (OSU). The article describes an ergonomic, high-vision system, the Ergo Vision System (EVS), for grass seed purity testing developed through a partnership between OSU Seed Laboratory and Mater International (supplier of tabletop seed-testing equipment) and OEM (laboratory equipment manufacturers). The performance of the EVS shows greater flexibility, speed, accuracy, and productivity, and better comfort and working conditions for the analysts and supervisors alike.

Seed Info encourages the exchange of information in the national, regional, and global seed industry. We encourage our readers to share their views and news through this newsletter. Your contributions are most welcome in Arabic, English, or French.

Happy New Year!

Zewdie Bishaw, Editor

WANA SEED NETWORK NEWS

This section presents information on the WANA Seed Network, including network activities and reports of the meetings of the Steering Committee and the WANA Seed Council.

ECOSA 2010 Seed Conference a Success

In 2009, the Board of Directors of the ECO Seed Association (ECOSA) outlined activities for 2010 which included providing assistance to establish new seed associations and strengthen existing ones; expanding the membership by enlisting private and public seed companies in the region and beyond; seeking financial support from donors for regional activities; and organizing a Second ECOSA Seed Congress.

The Second ECOSA Congress was organized along with the Seed and Seed Technology Fair from 28–31 October 2010 at the Istanbul Trade Fair, Istanbul, Turkey. The seed conference was organized under the theme Promoting Seed Trade: Procedures, Technologies and IPR. ECO, FAO and ICARDA were members of the international organizing committee (IOC), which also included ISF, ISTA, OECD, and UPOV.

General Assembly

The ECOSA Second General Assembly was held on 28 October 2010 in Istanbul, Turkey. Members and representatives of ECO member countries from Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan, Turkey, and Uzbekistan attended. The national seed associations represented were the Afghanistan Seed Association (ANSOR), Seed Association of Kyrgyzstan (SAK), Seed Association of Tajikistan (SAT), Turkish Seed Union (TÜRK TOB) and its Sub-Unions (TSÜAB, etc.), and the recently formed Seed Association of Pakistan (SAP). Members and delegates from ECO Member States, representatives of the ECO Secretariat, FAO, ICARDA, OECD, ISTA, and UPOV were also present.

The President of ECOSA presented the annual report detailing the progress made and difficulties encountered in strengthening ECOSA. The General Assembly after thorough discussion developed an action plan for strengthening the

membership in preparation for the ECOSA 2011 Congress in Turkey.

Technical Workshop

H.E. Dr Mehmet Mehdi Eker, Minister of Agriculture and Rural Affairs (MARA) of Turkey, addressed the ECOSA 2010 Technical Workshop. The workshop had three thematic areas: (i) Plant variety protection (PVP) in the development of the seed industry in the ECO region; (ii) DUS testing and its significance in the seed industry; and (iii) Significance of seed treatment in the seed industry and future trends. Resource persons from UPOV, OECD and Syngenta provided background information and current trends in the seed industry. These presentations were followed by a discussion on how these issues are organized in practice and implemented at the national level, for example, in Turkey or elsewhere. The technical workshop provided useful information to the participants of ECOSA 2010.

Seed and Seed Technology Fair

ECOSA aims to explore and promote the seed trade by serving as a forum for public and/or private seed companies within and beyond the ECO region, and by sharing experiences among stakeholders of the regional and/or global seed industry. Therefore, ECOSA 2010 ran alongside the Seed and Seed Technology Fair, held from 28–31 October 2010 at the Istanbul Fair Center, where a large number of seed and seed-related technology companies participated. About 100 public and private seed companies, equipment suppliers, etc., from Turkey, Europe, Asia, and the Americas exhibited at the Fair.

ECOSA 2010 participation

About 100 participants from Afghanistan, Azerbaijan, Egypt, Ethiopia, France, Iran, Iraq, Pakistan, Kazakhstan, Kyrgyzstan, Pakistan, Switzerland, Tajikistan, Turkey, and Uzbekistan participated in the ECOSA 2010 Technical Workshop.

Zewdie Bishaw, ICARDA, P.O. Box 5466, Aleppo, Syria; E-mail: z.bishaw@cgiar.org; *Vebbi Eser*, General Directorate of Agricultural Research, MARA, Ankara, Turkey; E-mail: veser@tagem.gov.tr; and *Thomas Osborn*, FAO, Rome, Italy; E-mail: thomas.osborn@fao.org

Opening of Technical Workshop



H.E. Dr Mehmet Mebdî Eker, Minister of MARA, Turkey; Dr Fatih Unlu, Deputy Secretary General, ECO, Iran; Dr Vebbi Eser, ECOSA President, Turkey; and Dr Zevdie Bishan, ICARDA, Aleppo, Syria

Sessions of Technical Workshop



Seed and Seed Technology Fair





ICARDA Organizes Seed Enterprise and Management Course

ICARDA is implementing a number of agricultural projects in many countries across the Central and West Asia and North Africa region including Iraq, Libya and Yemen. ICARDA is the only CGIAR center with a functional Seed Unit that addresses seed system constraints to ensure that research impacts reach farming communities. The primary objective is to strengthen national seed systems, both formal and informal by: (i) supporting the public seed sector to become more effective and competitive, (ii) stimulating private seed sector participation through policy influence, (iii) designing alternative seed delivery systems for resource-poor farmers, and (iv) capacity development of human resources in the seed sector. The Seed Unit is involved in several integrated projects executing the seed delivery component in these projects.

The Rainfed Agriculture and Livestock Project (RALP) in Yemen is supported by the World Bank with the objective of promoting the improvement and use of crop landraces to increase agricultural production and productivity in rainfed areas. The project promotes on-farm conservation and participatory improvement of prominent landraces and the establishment of sustainable farmer-based seed production by encouraging farmer groups to organize themselves as seed producer groups and forming provincial associations.

The Australian Centre for International Agricultural Research (ACIAR) funds the project for the development of conservation cropping systems in the dry areas in northern Iraq. The project is based on the priorities of the Iraqi Ministry of Agriculture's national strategy within the broader context of the government's policy to boost agricultural production.

The ARC-ICARDA Collaborative Research Program funded by Libya Jamahiriya includes the implementation of three research-for-development projects focusing on integrating rainwater harvesting in agricultural systems for improved productivity; integrated improvement of wheat and barley-based cropping systems in rainfed and irrigated areas; and the improvement of small ruminant productivity.

The three projects have one common objective: to increase crop production and productivity through the development and dissemination

of new crop varieties, seeds and production practices. Within this context, the Seed Section organized the train-the-trainer course on Seed Enterprise and Financial Management from 1–11 November 2010 at ICARDA headquarters at Tel-Hadya, Aleppo, Syria. The primary objective of the course was to provide an overview of the technical, economic and organizational aspects of seed enterprise development and management for participants who are directly involved in the implementation of these projects in their own countries. The course included five participants from the General Seed Multiplication Corporation (GSMC) in Yemen; three from the Department of Agriculture, Mosul University, and the private sector in northern Iraq; and three from the Agricultural Research Center in Libya. All participants are from national organizations which are project partners and involved in the development of seed enterprises working with farmers. The participants are expected to transfer the knowledge acquired to their colleagues by organizing follow-up in-country courses.



Zevdie Bishan, P.O. Box 5466, Aleppo, Syria; E-mail: z.bishan@cgiar.org

NEWS AND VIEWS

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

Reconciling UPOV and Integrated Seed Systems¹

Part 1 of this article introduced the two key intellectual property rights (IPR) systems that are

¹This article appears in two parts. The first part appeared in SeedInfo No 39 described the history of IPRs in plant breeding and the seed systems. This second part covers IPRs and the concept of integrated seed systems

used in the seed industry. Part 2 aims to reconcile development, food security and agrobiodiversity policies and their effect on seed systems, leading to approaches of integrated seed systems development with IPR that countries have to implement following the WTO and bilateral trade agreements. It continues with an analysis of seed systems and the possible solutions to problems that may arise on introduction of IPRs in developing countries.

2. Seed Systems

Historical developments

Why is there so much debate about IPRs in the seed industry in developing countries and emerging economies? Seed is an important vehicle for improving agricultural output. It helps realize major development goals such as food security, poverty reduction and sustainable rural development, as well as effective management of agro-biodiversity. The availability of and access to quality seed by farmers is a key developmental issue. Conventional seed-sector development concepts are based on a linear approach in which policies are directed at developing seed systems by guiding them through a number of stages from the traditional to commercial sector. Seed policies in developing countries have long concentrated on this approach which aims to transform farmers' seed systems into formal and later on, into fully commercialized seed systems. This has resulted in large investments in the public seed sector, including government or contract seed growers' schemes, seed processing and storage facilities, certification and quality control agencies, etc. With structural adjustment policies, government involvement in seeds is reduced through privatization of (public) enterprises including selling off to a foreign investor (e.g. Malawi) or by promoting competition between domestic and foreign entrepreneurs (e.g. Turkey). However, the formal sector is unable to secure seed provision to all farmers except for commercial seed crops like maize and vegetables. These formal systems commonly provide less than a one fifth of the total seed need in developing countries and in some cases just a few percent.

Currently, the focus is on stimulating entrepreneurship in seed supply with special emphasis on seed marketing creating the demand side, provision of credit facilities, and organizing

agro-input dealers (e.g. Alliance for a Green Revolution in Africa²). Such developments are likely to make formal seed supply a lot more sustainable compared to public-sector seed provision. However, seed of self-fertilizing and smallholder farmer crops provide little incentives for commercial seed production. Therefore, integrated approaches to seed system development are needed.

Integrated seed systems

This concept recognizes the importance of both the formal and the farmers' seed systems, each with their advantages and limitations. They need to operate side-by-side, since they serve the needs of different types of farmers and different types of crops. The concept of integrated seed systems stresses that government policies (and laws) support both commercial seed sectors for commercial crops, and farmers' seed production for less commercial seeds. The latter could be done by extending seed quality knowledge to farmers (e.g. on recognizing seed transmitted diseases) or seed cleaning and storage technology. It stresses the importance of connecting knowledge and genetic resources in the two systems through, for example participatory approaches to breeding, reintroduction of genebank-materials and small seed enterprise development assisting farmer groups to gradually enter the formal seed sector.

Such a diversified approach creates challenges for both scientists and regulators, but the linear model has been shown to over-simplify reality, leading to ineffective or even counterproductive regulations and investments. For example, seed laws that focus on regulating only formal systems may indirectly affect both farmers' systems and the emergence of small-scale seed enterprises. Ethiopia is currently developing a new seed proclamation which provides different levels of seed quality control for different sub-sectors. Regulations that affect these integrated seed systems include not only seed laws, but also regulations on intellectual property rights. There is thus a need to reconcile plant breeders' rights (UPOV) and patent systems (WIPO) with the needs of farmers in developing countries.

IPRs in integrated seed systems

IPRs are important in a mature commercial seed system. They provide protection to those

²<http://www.agra-alliance.org/section/work/seeds>

who develop new varieties or new inventions. Harmonization of these laws is important to support the international seed trade. IPRs thus intend to contribute to the welfare of society. Maximizing welfare in society means for the seed sector that rules created to support the commercial sector do not impinge on the vast majority of farmers that depend on their own or locally acquired seed. The UPOV system recognizes this by making an exemption for farmers to reproduce their own seed (of some specified crops) and the European Union exempt smallholder farmers from paying a royalty on own-produced seed. The patent system does not recognize such exemptions!

Seed security for smallholder farmers requires an exchange of seed at the local level for both farmer and modern varieties. The UPOV system allows such exchanges for farmers who consume all their produce within the household. This interpretation of the 'private and non-commercial use' exemption in Article 15(1)i of the UPOV Act is too narrow for developing countries to adopt. Some argue that breeders will not exercise their rights on such locally exchanged seed, but it may be wiser to extend the interpretation of this article to allow free exchange among smallholder farmers. The definition of 'smallholder' may be based on land holding (not supported), income or production levels, or traded quantities. Introducing such an exemption is removing most of the debate between Breeders' Rights and Farmers' Rights, as the latter is mainly concerned with smallholder farmers.

Nevertheless, when Plant Breeders' Rights are made responsive to the needs of different seed systems, there may still be bottlenecks regarding IPRs. Patents increasingly rest on plant materials, and more and more these are not connected to transgenics (GMOs). Patents commonly do not include exemptions that apply to farm-saved or locally exchanged seed; this means that Farmers' Rights may still be severely challenged. It may be interesting to look at the European Biotechnology Directive of 1998. This Directive, which regulates the patentability of biotechnological inventions, contains a novelty that is relevant here. It explicitly states that if plant varieties fall within the scope of a patented invention, farmers are allowed to reproduce their own seed if such would be allowed under Plant Breeders' Rights. This means that the farmers' privilege also applies to patents.

It is possible to reconcile UPOV with the needs of the diversity of seed systems that are important for agricultural development and food security in developing countries. Such an approach will significantly reduce the opposition from countries to the UPOV system, and is likely to contribute to the application of the harmonized UPOV rules across a wider range of developing countries.

*Niels P. Louwaars, Centre for Genetic Resources, Wageningen University, P. O. Box 16, 6700 AA Wageningen, the Netherlands;
E-mail: niels.louwaars@wur.nl*

Integrated Seed System Development in Africa

The African Seed and Biotechnology Program (ASBP), developed by the African Union Commission together with FAO, and duly supported by the Heads of State, aims at supporting the increased availability of good seed of superior varieties for farmers throughout the continent. In an integrated approach, it takes into account the diversity of countries, farmers and crops.

In October 2010, a meeting was held in Addis Ababa to discuss this approach with a number of case study countries that represent a large part of the diversity in the continent. The concept of integrated seed system development recognizes the existence of different seed systems in each country at the same time. These include, for example:

- Farmers' seed systems, based on saving and local exchange of seed
- Community seed systems aimed at local sales or seed security
- Formal seed systems with public and private components
- 'Closed' – value chain enclosed seed systems (e.g. arranged by processors, exporters)
- Seed relief operations

Such different systems may require different types of support and control. National policies thus have to take into account this diversity. Seed regulations and breeders' rights laws thus need to be framed in such a way that they support development and at the same time, they should not unnecessarily impinge on other useful seed systems.

The concept and associated policies on investments, regulation and public initiatives

can serve as an umbrella for existing and future initiatives. It will be tested in five countries in the coming months, leading to a wrap-up meeting early in 2011, which will inform the ASBP and AU member states.

Janet Odeme, African Union Commission, Addis Ababa, Ethiopia; E-mail: edemej@africa-union.org and Niels P. Louwaars, CGR, Wageningen University, P. O. Box 16, 6700 AA Wageningen, the Netherlands; E-mail: niels.louwaars@wur.nl

Turkey Enacts GMO Regulation

A regulation on the commercial use of GMOs prepared under the biosafety law became effective from 26 September 2010 in Turkey. The regulation endorsed by the Ministry of Agriculture and Rural Affairs (MARA), includes applications for GMO sales, imports, exports, evaluation of applications, monitoring and controlling, and marketing GMO products to prevent consequences arising from their use in human, animal and plant health as well as environmental and biological diversity.

The law requires well-controlled research on GMOs for experimental or developmental purposes and prevents risks to the environment and living organisms. According to the regulation, the import of GMOs requires an official document prepared by the authorities of the source country or a chemical analysis from an internationally accredited laboratory. The regulation empowers MARA to carry out analyses or to control GMOs. MARA will record GMO products granted import permits and the importing firms; the law also applies to products imported free and for public use.

The Undersecretary of Customs will regulate the passage of GMOs through customs. The import of GMOs used other than for consumables and animal feed production purposes will be carried out collaboratively by the related Ministries and institutions such as the Scientific and Technological Research Council of Turkey (TUBITAK), Universities, etc. The import of products containing GMOs or GMO compounds will require prior authorization of the GMO content.

For exports, on the other hand, the procedure will be in line with the demands of the importing country and the Ministry will keep record of GMOs permitted for export. Transit passages will be handled according to the terms and conditions of the Ministry's permit and Customs Law, and

require measures to prevent GMO contamination to the environment (e.g. sealing the transportation vehicles). The Ministry controls and supervises measures taken and keeps record of the results.

The Scientific Committee sets the standards how GMOs produced and handled using containment facilities. GMOs or GMO compounds launched on the market should fulfill the requirements of the Turkish Food Codex. The product package should bear a label stating that the product contains a GMO or is produced from a GMO compound.

In the event of a violation of the terms of the regulation, or if new scientific data emerges about the potential risks of using GMOs and products with GMO content, the decision concerning the products may be canceled by the Scientific Committee and the products will be withdrawn from the market.

Source: Anatolia News Agency, 15 August 2010

UPOV News

Annual ordinary meeting

The Council of the International Union for the Protection of New Varieties of Plants (UPOV) held its annual ordinary session on 21 October 2010 and made several decisions. The Council noted a modest increase, three percent, in the overall number of applications (13,019) for plant variety protection in 2009. A record number of 86,325 titles were also registered in 2009, representing a six percent increase on figures for 2008. In 2009, the number of plant genera and species for which there were agreements between members of the Union for cooperation in the examination of distinctness, uniformity and stability exceeded 1,400 (a three percent increase on 2009).

Examination of laws

The Council decided that the Draft Law on Plant Variety Protection of Tajikistan was in conformity with the provisions of UPOV's 1991 Act. Tajikistan is in a position to deposit its instrument of accession to the 1991 Act of UPOV once it adopts the draft law.

Grant of observer status

UPOV granted observer status to the Association for Plant Breeding for the Benefit of Society and to European Coordination Via Campesina for the

Council, the Administrative and Legal Committee (CAJ), the Technical Committee (TC) and the Technical Working Parties (TWP) similar to that of CropLife International.

Information and guidance

The Council adopted a number of guidance and information documents relating to:

- a) Conditions and limitations concerning the breeder's authorization in respect of propagating material; the definition of variety; and a revision of the explanatory note on variety denominations;
- b) Guidance documents on the examination of Distinctness, Uniformity and Stability (DUS) and on DNA-profiling; and
- c) Information on software that would be made available by members of the Union to all other members of the Union.

A full report of the decisions of the Council at its forty-fourth ordinary session is available at: http://www.upov.int/en/documents/c/index_c44.htm.

Seminar on PVP and Symposium on UPOV

A seminar on the role of PVP in public-private partnerships will be held in Geneva on 11 and 12 April 2011. A symposium focused on plant research will be held in Geneva on 21 October 2011, as a part of the 50th anniversary of UPOV. For further information about UPOV, please contact: UPOV Secretariat: Tel: +41-22-3389155; Fax: +41-22-733 0336; E-mail: upov.mail@upov.int; Website: www.upov.int

AOSA Rules for Testing Seeds

AOSA announced that the 2010 AOSA Rules for Testing Seeds are now available. Updated annually, the AOSA Rules for Testing Seeds is a set of dynamic, continually evolving methods that reflect contemporary and progressive research in seed testing. The Rules consist of four volumes:

1. AOSA Rules for Testing Seeds, Volume 1. Principles and Procedures
2. AOSA Rules for Testing Seeds, Volume 2. Uniform Blowing Procedure
3. AOSA Rules for Testing Seeds, Volume 3. Uniform Classification of Weed and Crop Seeds
4. AOSA Rules for Testing Seeds, Volume 4.
5. Seedling Evaluation

These publications set the standard for seed testing in North America and are used internationally. The Rules are available electronically on CD or as printed hardcopies. The Rules CD can be purchased for \$75; this includes a set of licenses to print a hardcopy of the four volumes. Information and order forms are available from the AOSA website: <http://www.aosaseed.com/publications.htm>.

The AOSA Board approved a Tentative Rule Proposal on 14 October 2010. The section of the AOSA Rules for Testing Seeds affected by this change is 5.2 Identification and Cultivar Determination. The purpose of the Rule is to add additional or optional test methods to identify ryegrass growth types. Detailed procedures for the two PCR-based test methods will be published in the AOSA Cultivar Purity Handbook. Complete information, including supporting documentation and test procedures, is available on the AOSA Rules Committee website³. Use of a tentative rule is not mandatory. The purpose of a tentative rule is to give seed laboratories the opportunity to apply and evaluate a new method of testing seed before the method is submitted as an official rule proposal.

The primary functions of AOSA, Inc. are to:

- Establish the AOSA Rules for Testing Seeds.
- Contribute to the refinement and modification of the rules and procedures for seed testing.
- Ensure that testing procedures are standardized between analysts and between laboratories.
- Influence and assist in the enforcement of appropriate seed legislation at state and federal levels.

For more information, please contact: Anita Hall, Association of Official Seed Analysts, Inc., 101 East State St., #214, Ithaca, NY 14850 USA; E-mail: aosa.office@twcny.rr.com.

CONTRIBUTIONS FROM SEED PROGRAMS AND PROJECTS

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

Afghanistan Enacts a Seed Law

Government of the Islamic Republic of Afghanistan has enacted a Seed Law published by

³http://www.seedtechnology.net/rules_committee.htm

the Ministry of Justice in Official Gazette 1005 of 16 December 2009. This new Seed Law covers true agricultural seeds and vegetatively propagated planting materials. Comprising four Chapters and 29 Articles, the Seed Law will regulate seed production and marketing, seed trade (import and export) as well as all seed-related research activities in the country.

FAO with the financial support of the European Union has worked collaboratively with the Ministry of Agriculture for several years in developing the Seed Law and produced a final draft in August 2006. They submitted to the Ministry of Justice after intensive consultation with stakeholders nationwide and inputs by international experts, including ICARDA seed specialists.

Final official publication of the Seed Law is welcome news for seed producers and farmers across Afghanistan with the hope that it will bring better organization and positive changes in the seed industry, attracting foreign investment into the country's agricultural sector together with modern technology and improved knowledge. The law is also expected to put important institutional arrangements in place including a National Seed Board, an independent Seed Certification Agency, and a Variety Release Committee.

A strong foundation has already been laid for the Seed Law including a rapidly growing private seed sector, an active National Seed Association, a quality control system with international standards, and a functional National Seed Secretariat. With these developments, Afghanistan's seed industry is surely heading in a positive direction to which the Seed Law now serves as the formal guide and reference for all stakeholders and other relevant parties to follow.

Source: FAO Press Release

Iran Releases New barley varieties

In Iran, irrigated barley production is important in the temperate agro-climatic zone. Irrigated barley is grown on about 320,000 ha in the temperate zones with an average grain yield of 3.3 t ha⁻¹. Terminal drought, competition from summer crops for irrigation water, and haying-off limit barley production in these areas. New cultivars tolerant to terminal drought and haying-off, and with high grain yield, yield stability, early maturity, and high water productivity, together

with appropriate agronomic practices, are logical strategies to increase grain yield and production of irrigated barley in the temperate agro-climatic zones.

The Seed and Plant Improvement Institute (SPII) has released two new high-yielding barley varieties, Fajr 30 and Yousef, for the temperate irrigated zones. Yousef has been released based on its high grain yield and yield stability as well as its desirable agronomic characteristics which have contributed to its adaptation to terminal drought prone areas. Yousef yielded about one ton more grain than the check variety in farmers' fields. The highest yield for Yousef was about 9 t ha⁻¹. Fajr 30 has been released because of its high grain yield and yield stability and other desirable agronomic characteristics leading to its wide adaptation in the temperate areas of Iran. This variety is moderately susceptible to powdery mildew, resistant to lodging, and tolerant to low temperature and drought.



A seed multiplication field of Yousef variety released in Iran

In Iran, about 250,000 ha of irrigated barley are also grown in the cold agro-climatic areas. Bahman has been released based on its desirable agronomic characters which have contributed to its wide adaptation in these colder areas of the country. This cultivar is moderately susceptible to powdery mildew, resistant to lodging, and tolerant to low temperature and drought.

These three released varieties are selections from international nurseries received from ICARDA. The Dryland Agricultural Research Institute in Iran has reported that three other barley varieties (two winter/facultative and one spring variety), all derived from ICARDA's nurseries, are performing consistently well in national trials. These varieties are candidates for release in the 2010-11 crop seasons.

Samad Mobasser, SPCRI, Karaj, Iran; E-mail: sa_mobasser@yahoo.com

ICARDA Assists the Lebanon Seed Sector

The Lebanese Agricultural Research Institute (LARI) is responsible for variety development, seed production and distribution of major cereal and legume crops such as wheat, barley, lentil, and chickpea. The private sector companies focus on horticultural crops, introducing mainly hybrids for testing adaptability, performance, and quality for eventual commercialization of new varieties. LARI and ICARDA have long collaborated in cereal breeding, on-farm variety trials, and dissemination of improved crop varieties. In recent years, the agricultural sector has been neglected in favor of other sectors such as tourism. Although LARI still have seed production, processing, storage, and quality assurance facilities, seed production and distribution activities have declined significantly over the years.



Wheat seed having been cleaned, treated and fumigated for dispatch to Lebanon

In an effort to revive the seed sector, the Ministry of Agriculture requested ICARDA to provide support with the provision of foundation seed of ICARDA's most promising lines/varieties suitable for Lebanon. ICARDA provided the Ministry of Agriculture with 15 MT of foundation seed of wheat, barley, lentil, and chickpea to revive the seed sector in Lebanon. MoA and LARI will use the foundation seed to initiate a two-year seed multiplication program to produce adequate amounts of certified seed by the year 2012. LARI will multiply the foundation seed on its own farms and later on contract with seed growers to produce a sufficient quantity of certified seed. The certified seed will be processed at LARI facilities and will be distributed to farmers.

Hassan Machlab, ICARDA-Terbol, Beka'a Valley, Lebanon; E-mail: h.machlab@cgiar.org

Private Sector Forms Seed Association in Pakistan

In order to encourage investment, the Government of Pakistan declared the seed business as an industry in 1994 and allowed concessions at par with other industries. A national seed policy was announced enabling the private seed sector to enter the seed business and contribute to national development. Declarations of the seed industry spurred the private sector seed business and now, a decade and a half later, more than 665 seed companies are operating in the country varying from multi-national seed corporations to large, medium and small domestic seed companies. Despite such an increase in number, the seed industry has not been represented at regional or national levels. After several consultation meetings among various stakeholders, the 'seed persons' of Pakistan have established a national Seed Association of Pakistan (SAP) to support and facilitate the seed business in the country.

The need for a national seed association has been felt for some time among seed industry actors. In 2008, an informal meeting of seed people was held at Roberts Cotton Associates in Khanewal to discuss the formation of a seed association. National seed companies from Hyderabad, Multan and Sahiwal and leaders of existing seed associations such as the Association of Seed Companies of Pakistan (Sahiwal) and Chambers of Seed Industry of Pakistan (Multan), attended the meeting. The meeting reached a consensus for the formation of a national Seed Association of Pakistan.

On 9 June 2009, a meeting was convened at Multan for the seed companies to approve the formation of a national-level seed association. The meeting unanimously endorsed the idea and approved funding to facilitate an interim set up to follow up registration of the association with the government. The meeting also formed a Central Executive Committee (CEC) of the association.

The CEC called its first meeting on 20 June 2009 at Multan and appointed a seven-member expert committee mandated to develop the Memorandum and Articles of Association and ensure the formation and registration of the Seed Association of Pakistan (SAP). The CEC on 1 February 2010 unanimously appointed Mr. Shahzad Ali Malik and Dr. Qaiser Rashid as its first Chairman and Vice Chairman.

In March 2010, SAP applied for registration to the Director General, Trade Organizations, Ministry of Commerce, and the authority issued a license for its registration on 27 August 2010.

Although SAP is new, it has made an active start by participating in government policy making and statutory matters. SAP attended the first National Seed Council meeting and has requested the Government of Pakistan to let SAP provide input to proposed amendments to the Seed Act 1976, Truth in Labeling Seed Rules 1991, National Seeds Policy and Plant Breeders' Rights bill before they are adopted. SAP also plans to call a national conference to lay down a road map for moving the seed and the agriculture sector forward in Pakistan.

The association intends to carry out its objectives for the improvement of the national seed industry in particular and the agricultural sector in general in Pakistan. SAP plans to join international seed associations such as ECOSA, APSA and ISTA and put Pakistan on the global seed map.

The Association's address is Seed Association of Pakistan (SAP), 40-M, Johar Town, Lahore, Pakistan; Tel: +92-42-35315744, E-mail: sap.40mlhr@gmail.com.

Syed Irfan Ahmad, Editor, The Seed News, Islamabad, Pakistan; E-mail: seednews@hotmail.com

Seed Industrialists and Producers Sub-Union of Turkey

TSÜAB (Tohum Sanayicileri ve Üreticileri Alt Birliği = Seed Industrialists and Producers Sub-Union of Turkey), established under the Seed Law (No. 5553), is a professional organization having the status of a public corporate body. It is one of the sub-unions of the Turkish Seed Union (TÜRK TOB). TSÜAB officially become a representative of the Turkish seed industry on its establishment in 2008. According to the Law, all seed companies operating in Turkey must become member of TSÜAB.

TSÜAB members are involved in plant breeding and variety development, foundation and certified seed production, processing, packaging, marketing, and distribution as well as seed import and export both in domestic and foreign markets. Currently there are 370 TSÜAB member companies of which some are large integrated companies involved from variety development

to seed marketing and many are small companies specialized in seed production and/or distribution.

TSÜAB is responsible for representing the Turkish seed industry and contributes to its development within the statute of its bylaws. It encourages the formulation and implementation of national seed policies, the preparation and enforcement of science-based seed regulations, the harmonization of national legislation with international standards, and takes administrative decisions to facilitate and assist private industry. The sub-union also represents the rights and interests of its member companies on every platform.

TSÜAB promotes faster private seed sector growth and investment; accelerated variety registration and release procedures; compliance of member companies to its ethics; creation of fair competition and an enabling environment for the seed industry; plant breeders' rights; provision of varieties and quality seed to farmers; assistance to member companies for cooperation with foreign companies; and capacity development of human resources.

Table 1. Average domestic certified seed production during 2007–09 crop seasons

Crops	Average seed production (MT)	Private sector seed production (%)
Wheat	198,780	56
Barley	25,660	49
Maize	25,870	100
Sunflower	8,100	100
Potatoes	49,800	100
Cotton	12,000	100
Sugar beet	1,130	100
Vegetables	2,530	100
Forage crops	3,260	59
Total	327,130	68

Source: TSÜAB

The Board of Directors, Board of Supervisors and Disciplinary Board, elected by the General Assembly every two years, direct the activities of TSÜAB. The Sub-Union has a Secretariat which is responsible for facilitating and implementing policies and decisions made by the Board. The Board of Directors and the Secretariat are responsible for protecting the rights and interests of its members and are authorized to interact with the government and national and international organizations. TSÜAB is very active in the preparation of regulations related to the seed industry and trade.

Highlights of the Turkish Seed Industry

1. Agriculture in Turkey

Turkey is an important producer of agricultural and horticultural crops on a global scale. The major crops are cereals, legumes, sunflower, potato, vegetables, sugar beet, cotton, and forages. Although winter cereals occupy the largest cultivated area and production, some industrial and vegetable crops constitute the bulk in terms of monetary value.

2. Turkish seed industry

The seed industry constitutes the basis of the agricultural sector. In Turkey, agro-ecological diversity and the diversity of products required by the processing industry and consumers provide an opportunity for the seed industry to work on various crop species and varieties. Currently, over a thousand plant varieties of more than 150 crops are under seed production. In excess of 300,000 MT of agricultural and vegetable seed, either in certified or standard category, is produced each year.

Turkey is among the top 15 countries in the world with respect to the total amount of certified and standard seed produced. The Turkish seed industry, not only produces for a dynamic domestic market but also for export, has accomplished significant progress in the favorable agro-ecological zones of the country and where market opportunities exist with gradual increases from year to year. The seed industry makes consistent efforts to increase its technical capacity.

3. Seed Policy and legislation

From mid-1980s the government adopted several policy measures which include: (i) abolishing state monopoly on seed and creating opportunities for private sector; (ii) establishing the necessary infrastructure for seed production and marketing; (iii) liberalizing procedures and prices for seed import and export; (iv) providing low interest credit for investments in the seed sector; and (v) encouraging foreign investments in the seed sector.

Turkey has made every effort to update its seed legislation in order to increase domestic and international seed trade and bring new crop technologies developed elsewhere to its agricultural sector. The national seed industry operates within the framework of Seed Law No. 308 (21 August

1963), Seed Law No. 3976 (21 February 1994) and Seed Law No. 5553. Turkey has a Plant Breeders' Rights Act dated 2004 and is a member of UPOV. Harmonizing Turkey's seed legislation with that of EU is nearly complete. With the establishment of TSÜAB and other professional organizations, some seed and planting material related public services will be delegated to these corporate bodies.

4. Structure of the seed industry

Approximately 370 seed companies are currently operating in Turkey of which a few are multi-nationals, some are direct foreign investment companies and many are domestic firms. While some of the national companies are direct importers, a significant proportion of them also carry out domestic seed production. Besides, a large number of companies undertake research and a couple of them have successfully developed their own breeding programs, especially vegetables using their own germplasm and technical capacity. Although modern seed production started in the early 1950s, the development of the private sector started during the last 25 years. Private seed companies have predominately ensured seed supply for vegetables, turf grasses, sugar beet, maize, and sunflower for many years. However, the private sector has begun its involvement in winter cereals and cotton seed only during the last couple of years. At present, the public sector is largely involved in wheat, barley, food legumes, and some forage crops. Nevertheless, the interest of the private companies in some of these crops is also increasing (see Table 1).

5. Seed processing capacity

Although seed processing capacity has increased significantly over the last 20 years, there is a huge gap in seed processing capacity among the seed companies. About 100 seed companies currently own processing facilities whereas many companies depend on contract seed processing and packaging. High volume seed-processing facilities using up-to-date technology, especially in agricultural crops, have emerged lately. Some of these private seed companies have also established their own seed quality control laboratories where seed quality analysis is carried out using the state-of-the-art equipment and well-trained qualified staff.

6. International seed trade

Turkey's international seed trade has shown gradual and steady increases. In recent years, total international seed trade is approximately USD 200–220 million per annum, consisting of two-thirds imports and one-third exports. While Turkey imports seeds of some agricultural crops and most vegetables, it exports particularly maize, sunflower, cotton and some vegetable seeds. Both import and export trends are on the increase. Currently, numerous domestic seed companies are establishing partnerships with foreign private seed companies dealing especially with variety development and seed production.

7. Linkage with international organizations

Since the early 1960s, Turkey has been in technical cooperation with ISTA and OECD in seed testing and certification, respectively. Turkey gained an equivalency status with some EU seed schemes in 1989. The central seed-testing laboratory is an ISTA accredited laboratory. The country produces seed of almost all crop varieties under the OECD seed schemes. It was included in the OECD Vegetable Seeds Scheme in 2007 and its equivalency with the EU was extended until 2012. Turkey currently is a member of ISF (International Seed Federation), ESA (European Seed Association) and EESTNET (Eastern European Seed Network). Furthermore, it is among the founders of the Seed Association of the Economic Cooperation Organization (ECOSA), established in 2010.

RESEARCH NOTES

Short communications on practical research or relevant information on agriculture or seed technology are presented in this section.

Redesigning a Purity Testing System: Development of an Ergonomic, High-Vision, Continuous-flow Seed Inspection System

by

Adriel Garay Sherry Hanning and Sabry Elias⁴

The need and the opportunity

Rapid changes in the seed industry require

⁴ Oregon State University, Seed Laboratory, Corvallis, OR973431-3002, USA; This article was first published in ISTA News Bulletin No 139, April 2010 and reproduced with permission from ISTA Secretariat.

innovations in seed testing systems. In Oregon, USA, the grass seed sector has changed by quantum leaps to respond to the faster pace of the modern global grass seed industry, yet the purity testing methods generally had not changed for many decades where innovation to improve it was urgently needed.

Oregon is the home of a very modern and dynamic grass seed industry. Grass seed has to be harvested, cleaned, tested, labeled and shipped to other states and countries around the globe within a very short period to respond to market demands. There is strong seasonal surge in purity test requests and any delay in immediate delivery of the results is a problem for seed growers, cleaners, dealers and users. The OSU Seed Laboratory (OSU-SL) found itself needing to respond to short time demands of its customers where faster, more effective and efficient system was urgently needed. Hiring a large number of temporary assistants and implementing extended hours of expensive overtime with the regular staff could not solve the problem and was seriously straining the budget.

Purity inspection depends on analysts painstakingly inspecting samples to distinguish and identify seeds correctly. In this regard, grass seeds present more challenges than larger seeds. For example, most other seeds (crop or weed) found in a grass seed sample typically belong to the same grass family (*Poaceae* spp). This is, in part, because selective herbicides cannot effectively control many grass species in the field, and seed cleaners cannot separate other seeds of similar size and shape. Yet, any seed contaminant in a sample still needs to be distinguished and identified correctly based on fine morphological features, all of which require high-quality vision for a correct determination of seed type. These factors indicated clearly that the purity testing system needed urgent innovations.

Limitations of conventional purity board system

The conventional purity board has not changed since purity testing began over 100 years ago (Figure 1). Anyone who has tested the purity of small seeds is familiar with this method, where the analyst is expected to carry out the work in a hunched-over working position, holding a hand lens in one hand and forceps or a slide in the other to move the seeds. If analysts are examining very small seeds, they are even afraid of breathing normally for fear of blowing the small seeds away.



Figure 1. A photo from the middle of the last century from the OSU-SL archive, showing the hunched working position of a seed analyst using a hand lens and forceps, which often caused discomfort and affected productivity

Lack of comfort and the equipment and tools used by the analysts are limiting factors for productivity. Another limitation is lack of preliminary working sample preparations. For example, samples that had abundant inert material need to be separated manually. The task of separating such particles individually is not just difficult, but limits productivity, especially if the sample has high proportion of fine, lightweight and small particles. After examining the needs of the industry, the weaknesses of the conventional system and the slow flow of grass seed testing, the OSU-SL concluded that a better, faster and cost-effective system had to be developed in order to respond to the needs of the industry.

The new Ergo Vision System (EVS)

The new EVS was conceived as an integrated approach with two major components: first, the equipment with all the essential components to enhance analyst performance; and second, a procedure for prior preparation of samples to further enhance analyst performance. The equipment would allow the analysts to work more comfortably, differentiate particles clearly and correctly and achieve higher productivity. Preliminary sample preparations (blowing, screening, filtrations, etc.) would reduce the need to remove most particles by hand.

The OSU-SL collaborated with Mater International and OEM Inc both from Corvallis and focused on assessing the flow of the seed purity inspection process; and by applying a systems approach, identified multiple opportunities for process improvement. After three years of

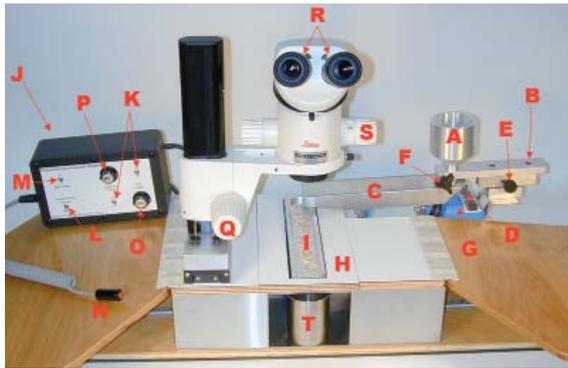


Figure 2. Ergo Vision System: A Funnel (feeds the sample); B Funnel holder plate; C Feeder tray; D Back plate of bulk feeder tray; E Funnel adjustment knob; F Funnel clamp knob; G Feeder vibrator; H Removable cover; I Inspection tray; J Feeder control panel; K Feeder switches; L Remote switch; M Main power switch; N Hand switch; O Bulk speed dial; P Inspection speed dial; Q Main focus knob; R Eyepiece focus; S Magnification setting; T Collection cup.

incremental improvements, the team achieved the new EVS (Figure 2) that is popular at the OSU-SL. The system is a flexible modular system that integrates ergonomics, continuous seed flow, a choice of optical systems, precise feeder controls, interchangeable inspection trays and seed hoppers, and a hand or foot switch to stop and start the vibratory feeders. In addition, the whole microscope mount can be adjusted back and forth, and the eyepiece can be adjusted to the needs of the operator.

In one case, the optical system was mounted on the opposite side to accommodate a left-handed analyst. Users may tailor the system to fit their needs and accommodate their physical characteristics or applications. Video systems can be incorporated and are used by the laboratory for group demonstration and teaching. In essence, the concept with the new system is to have the equipment, with all its essential components, fit the needs and potentials of each individual analyst.

Operation of Ergo Vision System

The procedure includes the following steps:

1. The working sample is placed in the sample holding funnel. Funnels and inspection trays of different sizes can be used to accommodate seeds of different sizes. The seed flows from the funnel to trays that are calibrated to the desired level.
2. The feeder tray moves the seeds to the inspection tray where the seeds are inspected. The speed of seed flow can be controlled

by adjusting the vibration of the seed tray as desired by the analyst. The inspection trays are designed to spread the seeds uniformly. They are interchangeable, so that very small seeds such as bent grass (*Agrostis* spp.) to large seeded species such as wheat stay within the field of view.

3. The seeds are examined using a high quality microscope, Mantis Inspection Viewer or video camera. The magnification can be adjusted depending on the kind of seed and the kind of contaminants being inspected.
4. The image clarity can be enhanced by fiber optic or LED lighting (not shown in Figure 2) directed to the viewing area.
5. The flow of seed can be stopped at any time to make a closer examination of any object and to separate the contaminants from the sample.
6. The inspected seeds are automatically deposited from the inspection tray into the sample-holding cup in the front of the inspection station.

Once analysts use an EVS inspection station, they can see the twin benefits of increased comfort and productivity. With the EVS, a long day of purity analysis is no longer as physically demanding. A survey conducted in the purity section of the laboratory provided an insight on the performance of the EVS showing greater flexibility, speed, accuracy, productivity, and better comfort and working condition for the analysts and supervisors alike.

Current applications

The EVS was developed with features that can allow a broad range of applications. These features, combined with better preparation of the working sample before submission to the analyst, have allowed the EVS to be used for many examinations. Some successful examples at the OSU-SL are:

- a) The working samples for purity separations already blown, which removes lightweight inert material. This allows the analyst to examine the lightweight material separately from the heavier particles. Presenting the sample in discriminated manner by particle size (rather than mixed ones) allows more detailed inspection of each fraction and reduces the need for removing some particles manually by the analyst.
- b) The working sample for bulk examination



Figure 3. The EVS being used where the analyst sits in an ergonomically correct position and uses both eyes at optimum magnification. The seeds flow continuously and the process can be started and stopped any time to remove contaminants.



Figure 4. Application of EVS for determination of seeds in soil-seed bank tests at OSU-SL; seeds are clearly distinguishable due to preliminary preparation of the sample.

for noxious weed seeds (AOSA), other seed determination (ISTA) or sod quality examinations (Oregon), is presented after precise screening. This makes it possible to examine each particle size fraction separately at optimum magnification at all times (Figure 3).

- c) Soil seed-bank tests are always been difficult because seeds covered by soil are difficult to differentiate from other particles. To simplify the process, the soil sample goes through a filtration process to eliminate clay particles, followed by drying and screening. With this process, all sand particles, plant material and seeds become differentiated and identified (Figure 4).

In addition to seeds, the EVS may be used for identifying other particles. For example, with the appropriate magnifying lens, it has been used for identifying different pollen grains. In theory, larva of different insects, minerals with different features, computer chips of different shapes, etc; may be identified and separated as long as there

are proper descriptors for each type of particle. Our experience has demonstrated that with proper adaptations and validations it may be used for examinations that had not been possible before at such high production speed.

All of the above would be of academic value if the innovation did not have any impact on the service quality in terms of speed. The estimation at OSU-SL has shown that, depending on the analyst, the use of the EVS has resulted in an improvement in efficiency of about 20–30%. Data collected through the years, for the peak testing season (August–October), demonstrate that the turn-around time has been improved. For almost a decade, prior to 2001, the delay in purity testing used to be more than 15–20 days and made many customers very unhappy. Since the transition to the new system, around 2002–04, the purity testing results are reported consistently in less than a week, well within customer expectations.

Conclusions

The experiences of the analysts and the results achieved and presented in this article lead to the following conclusions:

The productivity of the analysts can be limited by the lack of an adequate system (including equipment, tools, sample preparation, proficiency, comfort, etc.) to carry out purity testing. This was clearly demonstrated in the conventional system, where the analyst was simply equipped with a purity board and a hand lens. Using such a system and despite the use of overtime and a large staff, large backlog situations were experienced.

An improved system, consisting of proper sample preparation and the use of an EVS, can enhance the performance of each analyst and as a result the service capacity of the whole laboratory. This is demonstrated by the fact that after switching to the new system, the laboratory has significantly reduced the waiting time for purity test results.

Improved systems for purity work such as the one described, produce other important benefits including reduced health concerns, improved morale, reduction of absences, increased learning speed and greater proficiency.

In addition to accuracy and speed of services, one of the constant worries in a seed-testing laboratory, like in any other service business, is cost control. In the experience being described, cost control was reflected from reduced temporary or

regular staff, less paid overtime work, and higher proficiency and productivity of regular staff. This overall development has been possible thanks to the contributions of a team that worked on the design, development and evaluation of the EVS from the respective organizations. It is worth noting that the article does not promote a certain company, but the technologies aimed at advancing purity testing in general.

Source: *ISTA News Bulletin No 139, April 2010*

MEETINGS AND COURSES

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

Conferences

AFSTA 2011, 13–17 March 2011, Lilongwe, Malawi. The African Seed Trade Association arose out of a need to have a regional representative body for the seed industry, which could also serve to promote the development of private seed enterprises. Malawi was instrumental in holding its preparatory meeting in 1999; and AFSTA in going back for its 2010 congress after a little over a decade. For more information on AFSTA 2011 please contact: AFSTA, P. O. Box 2428 - 00202, Nairobi, Kenya; Tel: +254 20 2727853 or +254 20 2727860; Fax: +254 20 2727861; E-mail: afsta@afsta.org; www.afsta.org

ISTA Annual Meeting 2011, 13–16 June 2011, Tsukuba, Japan. The International Seed Testing Association (ISTA) announces its Annual Meeting, to be held from 13–16 June 2011 in Tsukuba, Japan. The ISTA Annual Meeting provides the opportunity to meet other seed experts and to exchange experiences. The aim of the meeting is to discuss and decide on proposals for changes to the ISTA International Rules for Seed Testing, and business items of the Association, with the international participation of ISTA delegates and representatives from both the seed industry and governments, including experts in seed technology, scientific research and laboratory accreditation.

Agricultural Biotechnology International Conference 2011, 6–9 September 2011, Johannesburg, South Africa. This conference

aims at providing an in-depth understanding of the advances and innovations that are significant and sustainable in moving nations towards a global bioeconomy. ABIC 2011 will bring together leading international researchers in the AgBio sector with industry partners and investors under the theme ‘Agricultural Biotechnology for Economic Development’. Agricultural biotechnology is no longer viewed as just part of the agricultural sector, but recognized as a significant player in economic development at national and international levels (<http://www.abic2011.co.za/>).

The ABIC Foundation is accepting applications for a travel bursary for ABIC 2011. The deadline for submission of applications is 15 February 2011 with award announcement set for April 2011. The bursary will cover the cost of travel, accommodation and meals while attending the conference, as well as registration fees to attend ABIC 2011. The annual bursaries were created to encourage ABIC attendance from among young scientists in emerging nations. In this way, the ABIC Foundation assists promising new researchers by making the ABIC network of ag-biotech contacts more accessible. For more details, please contact: abicfoundation@abic.ca.

Courses

Seed Business 101

The course was created with input from industry executives to accelerate the careers of promising new employees. By selecting and sponsoring employees to attend this course, companies acknowledge past performance and invest in accelerated professional development. The course also offers invaluable insights and perspective to seed dealers and companies offering products and services to the seed industry, including seed treatments, crop protection, seed enhancement and technology, machinery and equipment, etc. The goal of the course is to enhance participants’ career performance and help them develop skills and knowledge. The course is designed to focus on optimum operations of the five major functional areas of a seed company. (i) Research and development; (ii) Production; (iii) Administration; (iv) Operations; (v) Sales and marketing. Participants will acquire a broad understanding of the major aspects of a seed company’s operations and cross-departmental knowledge of best practices for profitability.

This course will be offered in four locations in California and Idaho between November 2010 and February 2011. Each session will be limited to 30 participants. For more information contact: Jeannette Martins (jmartins@ucdavis.edu) or Michael Campbell (mlcampbell@ucdavis.edu) or register at: http://sbc.ucdavis.edu/education/seed_business.html

LITERATURE

Books and journal articles and other literature of interest to readers are presented here. Please send information on seed and other agriculture related publications on policy, regulation, and technology to the Editor for inclusion in Seed Info.

Books

Yadav, S. S., D. L. McNeil, Robert Redden, and S. A. Patil, (eds.). 2010. Climate Change and Management of Cool Season Grain Legume Crops. Legumes are major source of food and feed worldwide particularly in developing countries. Climate change is likely to exacerbate the effects of heat and drought stress and in the future push legume production into more marginal lands. The book covers all aspects of legume production technologies, plant ecological response, nutrient management, biological nitrogen fixation, molecular approaches, potential cultivars, biodiversity management under climate change.

Also covered are various aspects of legumes management under climate change including:

- Production management technology, ecology and adaptation, diseases, and international trade
- Physiology and crops response to nutrients, drought, salinity, and water use efficiency
- Biodiversity management, molecular approaches and biological nitrogen fixation
- Climate change and strategies

The book presents a comprehensive and up to date review of research on different cool-season grain legume crops, nutrient management, biotic and abiotic stress management, agronomical approaches to drought management, salinity, drought, weed management, water use efficiency, and impact on international trade around the world. The book will be of great value to legume breeders, grain producers, agronomists, scientists,

academic researchers, graduate students, traders, and farmers in the developing and the developed world. Published by Springer (www.springer.com), ISBN 978-90-481-3708-4; Price: £153; 460 pp.

Roe, D. and J. Elliott. 2010. Poverty and Biodiversity Conservation. The degradation of ecosystems and loss of biodiversity are a common cause of poverty and social conflict. Protecting biodiversity and reducing poverty would therefore seem to be strongly linked. Yet despite this, conservation and development have often found themselves in conflict, with climate change adding further complexity to the debate, while also increasing the urgency of finding ways forward.

The book is a collection of policy documents, journal articles and reports focusing on the decline in funding for conservation, lack of attention for biodiversity in development policy and the social implications of protectionist conservation. Other important topics include the roles and responsibility of conservation NGOs towards local communities and the implications of REDD (reduced emissions from deforestation and degradation) as a climate mitigation strategy. A final section looks ahead to the potential for conservation-poverty partnerships. Published by Earthscan (www.earthscan.co.uk), ISBN 978 1 84407 843 1 (paperback); Price: £24.99; 397pp

Websites

Rust SPORE

FAO has launched a website to track the advance of Ug99, the devastating strain of wheat stem rust and other wheat rusts. The aim of Rust SPORE is to deliver up-to-date information on the status of wheat stem rust, monitor important new strains of the disease, and provide easy access to reliable global data.

Information is based on field data from national surveillance teams in cooperating countries, trained in the use of harmonized surveillance protocols and forming an international rust surveillance network. The recent report of Ug99 in South Africa has raised further concern about the spread of this disease, which presents a severe threat to the world's wheat crops. There are now seven recognized variants of the strain, to which 90% of global commercial wheat varieties are vulnerable.

Rust SPORE is part of FAO's Wheat Rust Disease Global Program and an important part.

of the BGRI efforts to mitigate the effects of wheat rust diseases globally. Rust SPORE is presently focusing on stem rust and Ug99, but will be expanded to incorporate other wheat rust threats in the near future. For more information, please visit the website at:

<http://www.fao.org/agriculture/crops/rust/stem/en/>

GIPB

The Global Partnership Initiative for Plant Breeding Capacity Building (GIPB) has launched the Plant Breeders' Directory (PB-Directory) as part of its on-going efforts to foster an all-inclusive global network of scientists, policy makers and other stakeholders engaged in the conservation, use and dissemination of plant genetic resources for food and agriculture. This new tool enables individuals to network with colleagues worldwide, permitting them to interact with people working on themes of mutual interest, explore the works of others, create or join interest groups, etc. Members can update their profile and new members can join the directory to build a community for crop improvement. For more information, visit PB-Directory at: http://km.fao.org/gipb/index.php?option=com_community&view=frontpage&lang=en.

Seed Orchards

Seed Orchards, is a working party of the International Union of Forest Research Organizations. The main scope is to facilitate exchange of information on the research and progress of seed orchards and seed crops. Seed orchards are the link between research and breeding towards better forests, and better forests help in solving future problems of the world, like shortages of raw materials, energy,

global warming, and sustainability. Scientific research for improving seed orchards and discussion for sharing experiences and progress are keys to that goal. This research group draws together those interested in research and management strategies concerning the genetics of seed orchards, management of seed production, flowering, seed physiology and technology, injuries and protection, economics, seed dormancy, testing and storage; impact of seed orchards on ecosystems on landscapes, and conservation. For more information, visit the website at: <http://www-genfys.slu.se/staff/dagl/SeedOrchardResearchGroup/>

World Agriculture: Problems and Potential

World Agriculture is a new peer-reviewed scientific review journal directed towards opinion formers, decision makers, policy makers, and farmers. The first issue was released in April 2010. The journal gives an independent, unbiased assessment of the impact of new technology, population and climate change on agriculture. It will also address issues of change and development in ecology, forestry and fisheries which are economically and culturally important. For more information, please visit the website at: <http://www.world-agriculture.net/>

Seed Newsletter

Iowa Seed and Biosafety

This is the newsletter of the Seed Science Center and Biosafety Institute for Genetically Modified Agricultural Products published by Iowa State University in Ames, Iowa, USA. The newsletter keeps abreast of current developments related to the activities of the Center in the US and global seed industry. For more information, please visit the website at: <http://www.bigmap.iastate.edu>.

The views published in Seed Info are those of the contributors and do not necessarily imply the expression of any opinion on the part of the Editor, the WANA Seed Network, or ICARDA.
