



# SEED INFO

Official Newsletter of the WANA Seed Network



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## EDITORIAL NOTE

**S**eed *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.



Formal seed system requires mandatory varietal and seed certification, where seed production fields are inspected and seed lots are tested for quality, for the commercialization of certified seed. Such mandatory system requires huge investment, and many developing countries lack the physical, financial and human resources for implementing such comprehensive certification schemes. In the 1980s, the FAO proposed an alternative seed certification scheme called *Quality Declared Seed (QDS)* to replace stringent and costly mandatory certification schemes. Above all, the QDS system proposed realistic and achievable field and seed standards; and shifted the responsibility for seed quality from certification agencies to seed producers. In the **NEWS AND VIEWS** section Britt Granqvist from BriAgri ApS Consultancy Company in Denmark provides readers with the practical advantages of introducing and implementing a QDS system for local seed production and marketing by small-scale farmers, taking into consideration the experiences of Tanzania. There is also news on the AFSTA Seed Congress 2009 in South Africa, and the World Seed Congress in Antalya, Turkey, the establishment of an investment fund for African seed companies by AGRA and AAC and the global growth and adoption of biotech crops.

The Alliance for a Green Revolution in Africa (AGRA) and the African Agriculture Capital (AAC), a venture capital investment fund that invests in several small African seed companies, launched the African Seed Investment Fund (ASIF). The first fund of its kind in the continent, ASIF will invest in at least 20 small- and medium-size seed companies in Southern and Eastern Africa over the next five years. The fund will operate in eight countries: Ethiopia, Kenya, Malawi Mozambique, Rwanda, Tanzania, Uganda and Zambia.

According to the International Service for Acquisition of Agri-biotech Applications (ISAAA), consistent and substantial economic, environmental and welfare benefits offered by

biotech crops, led millions of small and resource-poor farmers around the world to continue planting more hectares of biotech crops in 2008, the thirteenth year of commercialization.

ISAAA reported that the global area of biotech crops has reached a record 125 million ha in 2008, from 114 million ha in 2007. About 13.3 million farmers planted biotech crops in 2008 in 25 countries (10 developed and 15 developing countries), up from 1.3 million in 2007. Bolivia become the ninth country in Latin America to adopt biotech crops in 2007, while Burkina Faso in Africa began planting biotech cotton, and Egypt planted biotech maize for the first time in 2008.

The section on **SEED PROGRAMS** includes news from Afghanistan, Egypt, Ethiopia, Pakistan and Turkey. The news from Afghanistan focuses on the wheat varietal releases by the FAO-EU Seed Project. We are also reporting on the efforts of ICARDA and CIMMYT in developing stem rust resistant varieties and accelerated seed multiplication in selected countries including Afghanistan, Bangladesh, Egypt, Ethiopia, Nepal and Pakistan.

The **RESEARCH** section aims to capture information on adaptive research or issues relevant to seed program development in the region and beyond. In the present issue, however, we feature an article entitled *Knowledge and Innovation for Agricultural Development* prepared by Kwadwo Asenso-Okyere and Kristin Davis from IFPRI. The article provides an insight from knowledge generation to key policy options for promoting knowledge and innovation for agricultural development.

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

The questionnaire seeking your opinion on the contents, improvements and best ways of sending you the *Seed Info* newsletter is still open until 31 August. To complete this short survey on-line, please visit the site at:

[http://www.icarda.org/publications/SurveySeedInfo/ICARDA\\_SeedInfo\\_User\\_Survey.asp](http://www.icarda.org/publications/SurveySeedInfo/ICARDA_SeedInfo_User_Survey.asp)

Have a nice read

Zewdie Bishaw  
Editor

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## WANA SEED NETWORK NEWS

**T**his 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 Approves Bylaws and Plans Seed Conference

In the last two issues of *Seed Info*, we reported on the activities of a new regional seed association representing 10 member countries of the Economic Cooperation Organization (ECO) region comprising of Afghanistan, Azerbaijan, Islamic Republic of Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan.

#### *ECOSA bylaw approved*

ECO, FAO and ICARDA organized the First Preparatory Committee meeting of ECOSA from 14-16 March 2009, in Antalya, Turkey, which was hosted by the Ministry of Agriculture and Rural Affairs (MARA) of Turkey. Public and private seed sector representatives from Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Turkey and Uzbekistan attended the meeting.

During the meeting, the draft bylaw for the establishment of the ECO Seed Association was finalized and approved as mandated by the 4th ECO Ministerial Meeting on Agriculture (Baku 2008) and 18th ECO Council of Ministers Meeting (Tehran 2009). Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey and Uzbekistan signed the bylaw of ECOSA. Members of the Board of ECOSA were appointed from Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, and Turkey. At the outset, Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan and Turkey applied for ordinary membership of ECOSA and Azerbaijan and Uzbekistan committed themselves to applying upon establishment of their respective national seed associations. Several private companies have already shown an interest and applied as associate members from ECO member countries. The first general assembly of ECOSA will convene on 1 December 2009, before the First ECOSA International Seed Conference from 2-4 December 2009 in Antalya, Turkey.

The temporary address of ECOSA is located at Turkish Seed Union, Adakale Sokak No 22/12 Kizilay, Ankara, Turkey; Tel: +90-312-433 30 65; +90-312-433 30 66; Fax: +90-312-433 30 06; Contact person: Dr. Vehbi Eser; E-mail: veser@bisab.org.tr



*Participants of ECOSA Preparatory Committee Meeting, 14-16 March 2009, Antalya, Turkey*

#### *First ECOSA International Seed Trade Conference*

The First ECOSA International Seed Trade Conference (ECOSA2009) will be held from 2-4 December 2009 at the Fame Residence Lara & SPA Hotel in Antalya, Turkey. The conference will be organized by the Turkish Seed Union (Turk-TOB) and the Ministry of Agriculture and Rural Affairs (MARA) and their partners the Turkish International Development Agency (TIKA), the Economic Cooperation Organization (ECO), the Food and Agriculture Organization (FAO) and the International Center for Agricultural Research in the Dry Areas (ICARDA).

ECOSA2009 will cover a broad range of issues of interest in the seed trade and the global seed industry. It will provide an opportunity to promote seed business at global level in general and ECO region in particular and keep abreast with the current developments in the industry. The focus of the conference will be seed trade including exploring the status and prospects of seed industry; opportunities in the seed market; and international seed regulations and conventions of relevance to the ECO region. The ECO encompasses an area of 800 million ha and population of 350 million people with a rich variety of agro-climatic conditions suitable for crop and livestock production and huge potential and opportunities for seed market. For more details contact: Turkish Seed Union, Adakale Sokak, No 22/12, Kizilay, Ankara,

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Turkey; Tel: +90 312 433 30 65; +90 312 433 30 66; Fax: +90 312 433 30 06; E-mail: ecosasecr@gmail.com.

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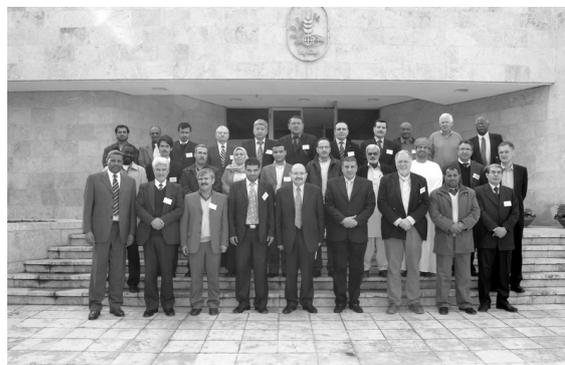
### Regional Plant Variety Protection Workshop

ICARDA, through its Third Country Training Program Project supported by Japan International Cooperation Agency organized a Regional Workshop on 'Plant Variety Protection and Implications for Seed Industry Development' from 2-5 March 2009, in Aleppo Syria. The workshop created an opportunity for dialogue among stakeholders in the seed industry, to rationalize the introduction and implementation of plant variety protection (PVP) at national or regional levels. The specific objectives of the workshop were to:

- Create awareness among senior researchers, managers and policy makers on international treaties such as Conventions on Biological Diversity and International Treaty on Plant Genetic Resources for Food and Agriculture.
- Create awareness among senior researchers, managers and policy makers about intellectual property rights in general and plant variety protection in particular within the agricultural sector.
- Review the status of plant variety protection in the region and assess the existing technical, institutional and regulatory constraints.
- Develop recommendations and action plans to be undertaken regarding PVP in participating countries.

The workshop was attended by 23 senior agricultural research and seed program managers from CWANA countries; Afghanistan, Azerbaijan, Algeria, Egypt, Ethiopia, Iran, Jordan, Kyrgyzstan, Morocco, Oman, Pakistan, Syria, Tunisia, Turkey, Uzbekistan, the UAE and Yemen. The workshop program included key introductions on: (i) Current trends in seed industry development; (ii) Importance of seed policy for seed industry development; (iii) Overview of seed regulatory frameworks and opportunities for regional harmonization; and (iv) Status of PVP in participating countries. Implications of international conventions (CBD, ITPGRFA) on seed sector development were

extensively discussed; and more time devoted to Plant Breeders' Rights with introductions on PVP under the UPOV Convention, and its impacts on the seed industry. Another important issue discussed was the difference between Farmers' Rights and Farmers' Privilege.



*Participants of regional workshop on PVP, 2-5 March 2009 in Aleppo, Syria*

All countries recognized the importance of the PVP system and becoming members of UPOV (Azerbaijan, Jordan, Kyrgyzstan, Morocco, Tunisia, Turkey, and Uzbekistan). Egypt and Iran are in the process of becoming members of UPOV, and Algeria and Oman have variety protection laws but are not members of UPOV. Ethiopia and Pakistan have PVP laws, but they are not compliant with the UPOV Convention.

Working groups discussed topics on national seed policy framework, variety and seed regulatory frameworks and PVP and made valuable recommendations.

### NEWS AND VIEWS

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

#### **Quality Declared Seed Production: Opportunity for Small-scale Farmers**

##### *Background*

The formal seed system, with the exception of truth-in-labeling, requires mandatory varietal and seed certification where seed production fields are inspected and seed lots are tested for quality for commercialization of certified seed. Such mandatory system requires huge physical, financial and human resources, which is far

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beyond the reach of many developing country certification programs.

In the 1980s, FAO proposed an alternative seed certification scheme called *Quality Declared Seed (QDS)* to replace stringent and costly mandatory certification system, based on four key elements:

- Listing varieties eligible for production under QDS program.
- Registering seed producers with appropriate national seed certification authority.
- Field inspection of only 10% of the seed crops by the national authority.
- Laboratory testing of only 10% of the seed lots by the national authority.

Above all, the QDS system proposed realistic and achievable field and seed standards; and shifted the responsibility for seed quality from certification agency to seed producers.

#### *Adoption of QDS in Tanzania*

The QDS system as outlined by FAO<sup>1</sup> is not designed to replace a fully developed existing seed certification program, but proposes an alternative which requires fewer demands on government resources, and yet still provides good quality seed in countries with limited resources for seed certification. The QDS is an alternative way to reach small-scale farmers who do not have access to, and so do not use, certified seed for crop production. In Africa, for example, 90-95% of small-scale farmers use farmer-saved seed for crop production.

In 2001, the Government of Tanzania modified and adopted the QDS system and incorporated it into the national Seeds Act (2003) and its seed rules, regulations, procedures and guidelines (2007). It allowed interested farmers to organize themselves to produce and market seed under QDS system. In Tanzania, QDS was successfully introduced in a sustainable way to small-scale farmers, and today more than 90% of districts have included QDS production in their areas using government district funding.

In Tanzania, QDS addresses the key gap between formal sector certified seed supply and small-scale farmers demand for quality seed and access to new improved varieties. QDS is of

**higher quality, but still** sold at lower and affordable prices. The seed price is set by local market condition in the ward or the district. It builds on demand for better quality seed and better varieties.

The need for additional certified seed cannot be met by formal sector only. Therefore, QDS should be recommended for other countries as well to boost local seed trade and to build a solid base for supply and use of certified seed. It should be seen as a foundation for an efficient and effective seed industry.

#### *Procedures for production of QDS*

QDS is produced by a registered and trained small-scale farmer or a group of small-scale farmers engaged in producing seed for sale to neighboring farmers within the ward where the seed is produced.

A farmer who wishes to become a QDS producer must submit an application to the national official certification agency. Authorized district seed inspectors inspect only 10% of all seed production fields (spot-check controls) and sample the seed lots. The national official certification institute tests the seed; and seed lots that pass quality tests are approved as QDS and sold to farmers.

#### *Lessons learned - the advantages of QDS*

The QDS producers, who are professionally trained in QDS production, can have a sustainable business. A QDS producer starts up seed production with an assured market and income, to secure the seed production and to avoid financial problems. It is essential to build up a sustainable production to secure that a crop and a variety can be sold in the area; and that the producer knows her/his customers—the market.

For sustainability of QDS production, it is also essential that each trained producer has a partner or an associate who will take over the seed production for the village, if the seed producing farmers are not able to continue with the seed business. It is also recommended only to produce quantities that can be sold the same year.

To avoid conflicts in the seed market it is recommended *not to* produce QDS for crops or varieties which are already successfully supplied through formal seed trade in that area.

The QDS producers can be the future seed producers for seed associations, retailers or future seed business owners/seed traders or seed companies, or owners of other businesses.

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<sup>1</sup> FAO Plant Production and Protection Paper No. 117, (1993, ISSN 0259-2517) and No.185 (1998, ISSN 0259-2517)

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QDS production gives *female seed producers* good opportunities to start up small businesses, to sell seed of crops and varieties important for food security in the target areas.

The advantage for the *small-scale crop producing farmers* - future users and buyers of QDS - are that they can choose the crops of interest for their markets where certified seed is not available. They are introduced to new varieties and/or new market opportunities through demonstrations. Furthermore, they choose their variety preferences and are introduced to new technologies when they use quality seed, needed for stable crop production and food security.

All farmers in the QDS production area are in a close contact with other stakeholders in the seed chain, wholesalers, grain and final product buyers. It is important that the farmers in the rural areas where QDS is produced also are assisted, in a value chain approach.

In general, good knowledge about seed quality and the use of better varieties are essential for better crop production and higher yields. By combining QDS production of food and vegetable crops, this safeguards the small-scale farmers by making it possible for them to earn a better livelihood through increased and more stable production, improved income generation and increased nutritional security

It is costly for the *seed trade* to reach all areas in a country, where farmers are not used to buy and use certified seed. If seed companies/seed traders decide to distribute seed to retailers in the villages they are often faced with many obstacles. Small-scale farmers who buy certified seed can normally only afford to buy very small quantities. Further compounding the problem is that farmers often do not know the varieties and they first must be demonstrated. The buyers and markets for grain or final products do not exist or are not known, roads are not accessible, etc.

The advantages of QDS for the seed trade are that farmers will have better awareness and broader knowledge and demand for better varieties and good seed quality. There is a closer contact with the farmers and other stakeholders and the plant breeders will easily focus their work on farmer needs. QDS is a good way to minimize the gap to the private seed industry and to improve the seed trade and food production. Furthermore, the seed trade gets a better understanding of the local seed market.

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*E-mail: briagri@briagri.dk (formerly Advisor and Consultant of DANIDA Seed Program, Ministry of Agriculture, Tanzania).*

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### **Investment Fund for African Seed Companies Launched**

The Alliance for a Green Revolution in Africa (AGRA) and the African Agriculture Capital (AAC), a venture capital investment fund that invests in several small African seed companies, launched the African Seed Investment Fund (ASIF). The first fund of its kind in the continent, ASIF will invest in at least 20 small- and medium-size seed companies in Southern and Eastern Africa over the next five years. The fund will operate in eight countries: Ethiopia, Kenya, Malawi Mozambique, Rwanda, Tanzania, Uganda and Zambia.

The AGRA-AAC partnership aims to jumpstart a well-capitalized, competitive and efficient regional seed industry. Another goal of the partnership is to increase the participation of African seed companies in the global seed market, which is estimated at USD 30 billion. Up to US\$ 100,000 will be provided to small-scale seed businesses to be paid back within two years. Medium-size companies, on the other hand, can apply for loans of up to a maximum of US\$ 1.5 million, payable within three years. For more information visit the website at <http://www.agra-alliance.org/content/news/detail/920/>

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### **AFSTA Congress 2009 in South Africa**

The Ninth Annual AFSTA Congress was held from 2–6 March 2009 in Cape Town, South Africa. Mr. Paul Marais, Chairman of the South African National Seed Organization (SANSOR) chaired the opening ceremony. Two hundred and thirty delegates from 35 countries including representatives from regional and international organizations such as the African Organization for Intellectual Property (OAPI), the African Regional Intellectual Property Right Organization (ARIPO), ISF, ISTA, APSA, UPOV and FAO attended the congress. With “seed trade” as main topic of the Congress 2009, it was an excellent opportunity for the

delegates to discuss and exchange information and views amongst themselves.

The congress was preceded by two half-day workshops. The first was on Plant Variety Protection, facilitated by the UPOV. The presentations were followed by question and answer sessions that allowed the delegates to deepen their knowledge on the subject. The second workshop was on seed care and facilitated by Syngenta, during which experts in seed treatment presented various topics such as seed care application machinery, seed safety and carryover of treated seeds, operator safety and stewardship, and the global seed care market, among others.

All important topics were well attended which included: the strengths and weaknesses of the seed trade in Africa and world seed trade; promoting seed trade in Africa; opportunities, constraints and latest development on seed trade in Africa; the African seed industry in the face of the food crisis; strategy for the implementation of the harmonized seed regulations for promotion of seed trade; and analysis of the status of commercialization and use of biotech crops in Africa.



*AFSTA Congress delegates during the opening ceremony*

The objectives of AFSTA continue to be the organization of technical training related to seeds to build capacity of its members in 2009/10 among others, creating awareness of its membership on the latest developments in technology in relation to seeds and seed marketing. It will continue to actively support the harmonization of seed legislation processes in the sub-regions.

During the AFSTA General Assembly 2009, a new AFSTA Board was elected and eight new AFSTA members were approved. The AFSTA annual Congress has indeed proved itself an

international event to look forward to, and the focus is now cast on the next AFSTA Congress from 1–5 March 2010 in Bamako, Mali. The National Organizing Committee for the AFSTA Congress 2010 has already begun preparations to ensure that the Congress meets all expectations.

*Justin Rakotoarisaona, Secretary General of AFSTA;  
E-mail: afsta@afsta.org*

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### **World Seed Congress 2009 in Antalya, Turkey**

The most important event in the calendar of the International Seed Federation (ISF) is its annual congress, where all the activities carried out during the year are summarized and presented to its members. In 2009, the World Seed Congress was held in Antalya, Turkey, and 1100 seedsmen and seedswomen with more than 200 accompanying persons participated in the 3-day event.

Participants at the various Crop Section Meetings heard reports on the Turkish seed industry. Working Groups, Committees and Sections discussed several important issues. Documents and position papers on subjects important to the seed industry were adopted. They include:

- *ISF Rules and Usages for the Trade in Seeds for Sowing Purposes*: These revised rules provide the framework for contracts between companies for production and international trade of seed. In addition, they provide the basis for settling disputes that may arise between contracting parties. This revision takes into account some important changes that have occurred in international trade not least due to the development of new technologies.
- *Revision to the ISF View on Intellectual Property Rights*: The revision reflects advances in technology and their implications for the use of molecular markers for DUS testing in PVP applications.
- *Position paper on Farmers' Rights*: The seed industry expressed its views on the subject in the context of the International Treaty for Plant Genetic Resources in Food and Agriculture.
- *Position paper on 'Bio-energy – The role of plant breeding and the seed industry'*: This paper was

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developed by the ISF Field Crops Section and highlights the role of plant breeders in providing a wide range of crops and varieties, efficient when used as a natural resource and that minimize competition between food, feed and energy.

An interim report of a study on systems in place to collect royalty on farm-saved seed in ISF member countries was also presented. The responsible working group has audited several royalty collection systems with the aim of analyzing the mechanisms used and has developed an indicator of their efficiency in terms of remuneration to breeders.

A post congress workshop was dedicated to phytosanitary regulations, with the goal of fostering a greater understanding of phytosanitary procedures that impact the international movement of seed. Almost 100 representatives of the seed industry and the Turkish plant protection authority attended this event. The participants heard about and participated in discussions on an array of topics including phytosanitary certification, country of origin and re-export, transparency and availability of information on national phytosanitary regulations and problem solving. The next World Seed Congress in 2010 will be held in Calgary, Canada.

ISF also hosted a meeting between FAO and the regional seed associations as a follow up to the Private Sector Consultation workshop held at FAO on 25-26 Feb 2009. The purpose of the meeting was to explore future collaborations between FAO and regional seed associations. There was a clear expression of willingness for a deeper engagement between the seed associations and FAO to work for the development of seed systems particularly in developing countries.

*Radha Ranganathan, ISF, Geneva, Switzerland; E-mail; r.ranganathan@worldseed.org*

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### **Global Area of Biotech Crops Continue to Increase**

According to the International Service for Acquisition of Agri-biotech Applications (ISAAA), consistent and substantial economic, environmental and welfare benefits offered by biotech crops, led millions of small and resource-poor farmers around the world to

continue planting more hectares of biotech crops in 2008, the thirteenth year of commercialization.

ISAAA reported that the global area of biotech crops has reached a record 125 million ha in 2008, from 114 million ha in 2007. About 13.3 million farmers planted biotech crops in 2008 in 25 countries, up from 1.3 million in 2007. In 2008, the number of countries planting biotech crops include 15 developing countries and 10 industrial countries. Bolivia become the ninth country in Latin America to adopt biotech crops in 2007, while Burkina Faso in Africa began planting biotech cotton, and Egypt planted biotech maize for the first time in 2008.

The largest plantings of biotech crops were in the United States with 62.5 million ha followed by Argentina (21 million ha), Brazil (15.8 million ha), Canada and India (each 7.6 million ha), China (3.8 million ha), Paraguay (2.7), and South Africa (1.8 million ha). The remaining 17 countries, which grew biotech crops in 2008 in decreasing order of area were: Uruguay, Bolivia, Philippines, Australia, Mexico, Spain, Chile, Colombia, Honduras, Burkina Faso, Czech Republic, Romania, Portugal, Germany, Poland, Slovakia and Egypt.

Biotech soya bean continued to be the most popular, planted on 65.8 million ha, followed by biotech maize planted on 37.3 million ha and biotech cotton planted on 15.5 million ha. From the genesis of commercialization in 1996 to 2008, herbicide tolerance has consistently been the dominant trait. In 2008, herbicide tolerance deployed in soybean, maize, canola, cotton and alfalfa occupied 63% (79 million ha) of the global biotech area of 125 million ha.

The stacked trait products were by far the fastest growing trait group between 2007 and 2008 at 23% growth, compared with 9% for herbicide tolerance and 6% for insect resistance. Stacked products are a very important feature and future trend, which meets the multiple needs of farmers and consumers and these are now increasingly deployed by ten countries – USA, Canada, Philippines, Australia, Mexico, South Africa, Honduras, Chile, Colombia, and Argentina (seven of the 10 are developing countries),

In 2008, the number of farmers benefiting from biotech crops globally in 25 countries reached 13.3 million, an increase of 1.3 million over 2007. From a global 13.3 million beneficiary biotech farmers in 2008, (up from 12

million in 2007), remarkably over 90% (12.3 million up from 11 million in 2007) were small and resource-poor farmers from developing countries. The balance of 1 million were large farmers from both industrial countries (the USA and Canada) and developing countries (Argentina and Brazil). From 12.3 million small and resource-poor farmers, most were Bt cotton farmers, 7.1 million in China (Bt cotton), 5 million in India (Bt cotton), and the balance of 200,000 in the Philippines (biotech maize), South Africa (biotech cotton, maize and soybeans often grown by subsistence women farmers) and the other eight developing countries which grew biotech crops in 2008. The largest increase in the number of beneficiary farmers in 2008 was in India where an additional 1.2 million more small farmers planted Bt cotton which now occupies 82% of total cotton, up from 66% in 2007. The increased income from biotech crops for small and resource-poor farmers represents an initial modest contribution towards the alleviation of their poverty.

In 2008, the global market value of biotech crops, estimated by Croprosis, was US\$7.5 billion, (up from US\$6.9 billion in 2007) representing 14% of the US\$52.72 billion global crop protection market in 2008, and 22% of the approximately US\$34 billion 2008 global commercial seed market. The value of the global biotech crop market is based on the sale price of biotech seed plus any technology fees that apply. The accumulated global value for the twelve-year period, since biotech crops were first commercialized in 1996, is estimated at US\$49.8 billion, which when rounded off to US\$50 billion is a historical landmark for the global biotech crop market. The global value of the biotech crop market is projected at approximately US\$8.3 billion for 2009.

Source: *ISAAA Brief 39-2008: Executive Summary*

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### **Awareness of Biotech Crops in Pakistan**

The Pakistan community was briefed on the global status of commercialized biotech/genetically modified crops for 2008 during a press conference and scientific communication workshop in Karachi, Pakistan. Organized by the Pakistan Biotechnology Information Center (PaBIC), the conference

sought to give the latest information on the global trends regarding biotech crops released by the ISAAA. Notably, the high adoption rate among small and resource-poor farmers particularly in developing countries and increasing number of countries commercializing biotech crops were emphasized.

The challenge of feeding the growing population using modern biotechnology was stressed but, the major constraints to biotech research and development are technical skills, infrastructure, funds, the education system, and lack of professionalism. For more information, contact [iqbal.choudhary@iccs.edu](mailto:iqbal.choudhary@iccs.edu) or visit the website (<http://www.pabic.com.pk/24%20March,09%20Launching%20of%20ISAAA%20brief%2039%20articles.html>).

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### **International Treaty Push for Farmers' Rights**

The International Treaty on Plant Genetic Resources for Food and Agriculture Governing Body met in Tunis, Tunisia from 1-5 June 2009. The International Treaty on Plant Genetic Resources for Food and Agriculture (IT/PGRFA) treaty was established by the United Nations Food and Agriculture Organization (FAO) in 2001. The treaty aims at promoting conservation and sustainable use of plant genetic resources for food and agriculture, and equitable sharing of benefits derived from the use of those resources.

The Governing Body (GB), the treaty's highest organ, is composed of all member governments and meets at least once every two years; and promotes the full implementation of the treaty. The GB met from 1-5 June in Tunis, Tunisia and one of the highlights of this third session was the implementation of a multilateral system of access and benefit-sharing through the treaty's benefit-sharing fund. The fund is intended to be self-sustaining and is aimed at supporting conservation and sustainable use of PGRFA. To date the funds of the benefit-sharing are voluntary contributions from the governments of Norway, Switzerland, Italy and Spain, and is the first multilateral mechanism providing financial support as a way to share benefits arising from access to plant genetic resources.

However, those who access genetic material through the multilateral system agree

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that they will freely share any new developments with others for further research, or, if they want to keep the developments to themselves, they agree to pay a percentage of any commercial benefits they derive from their research into a common fund to support conservation and further development of agriculture in the developing world.

During the meeting, the GB announced 11 new projects on biodiversity conservation in research institutions, and financed by a benefit-sharing fund. Some of the projects include characterization and genetic enhancement of finger millet in western Kenya; on-farm conservation of local durum and bread wheat in Morocco; and conservation, dissemination and popularization of farmer-developed varieties by establishing village level enterprises in India. It also includes the contribution of traditional methods for the in situ conservation and management of maize in Cuba; the conservation and sustainable use of native potato diversity in Peru; and the on-farm conservation and in vitro preservation of citrus local varieties and sustainable utilization in Egypt. Most organizations who submitted the projects are publicly funded institutions such as universities, research institutes, and a gene bank, which raised concerns among civil society representatives on inclusion of farmers and the source of funding mechanism.

For the next cycle of project funding (2010-11), authority for the execution will be delegated to the bureau. The Secretariat will prepare a list of treaty members that are eligible for support under the benefit-sharing fund, based on a complete list of developing countries derived from the most recent World Bank classification of economies. All information generated by projects funded through the benefit-sharing fund shall be made publicly available within one year of the completion of the project, according to the Governing Body's third session.

Via Campesina, an international movement of peasants with members from 56 countries, issued a declaration on 2 June saying that biodiversity could not be preserved and renewed without the recognition of farmers' rights defined by the treaty. This particularly includes those rights - defined in Article 9 - on the preservation, use, exchange and sale of their seeds, and their participation in national decision-making, as well as the protection of their traditional knowledge.

The Governing Body on the last day of the session took a resolution on the implementation of Article 9 on farmers' rights. The resolution invites each contracting party to consider reviewing and, if necessary, adjusting its national measures affecting the realization of farmer's rights. It also encourages contracting members to submit views and experiences on the implementation of farmers' rights as set out in Article 9, involving farmers' organizations and other stakeholders.

*Source: Intellectual Property Watch, 22 June 2009*

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### **Monsanto Establishes International Scholars Program**

Monsanto Company announced the establishment of a scholarship program that will support students interested in improving research and production in rice and wheat. Monsanto's Beachell-Borlaug International Scholars Program honors the accomplishments of plant breeding pioneers Henry Beachell and Norman Borlaug, the fathers of the Green Revolution. Beachell's and Borlaug's contributions have led to the development of improved rice and wheat varieties which saved more than a billion people from starvation. The announcement marks the celebration of Borlaug's 95th birthday in March 2009. Monsanto allocated US\$10 million for the scholarship program, which will be administered by Texas AgriLife Research for the next five years. AgriLife Research is an agency of the Texas A&M University System.

Rice and wheat are considered by many to be the most important staple crops in developing countries, providing the necessary calories to feed billions of people every day. Many of the world's poorest people rely on these two grains as a key source of food. In 2008, farmers produced nearly 440 million metric tonnes of rice and more than 680 million metric tonnes of wheat. Yet, yields of rice and wheat have grown with a compounded annual growth rate of approximately 0.8% over the past decade, while the population has grown with a compounded annual growth rate of approximately 1.25% during the same time period. Accelerating yield growth will help to reduce hunger by helping to produce more food on the same number of acres.

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Students interested in applying to the program can learn more about the scholarship at <http://www.monsanto.com/mbbischolars>

## CONTRIBUTIONS FROM SEED PROGRAMS AND PROJECTS

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

### Afghanistan Releases New Wheat Varieties for Farmers

With the changing climatic conditions and emergence of new plant diseases, Afghan farmers are in dire need of new high yielding and disease tolerant varieties to replace many older varieties. It is in response to this need that the *Variety and Seed Industry Development* project, which is being implemented by the Food and Agriculture Organization (FAO) and the Ministry of Agriculture, Irrigation and Livestock (MAIL) with funding from the European Union (EU), is paying attention to the development of new varieties that have improved characteristics and performance.

After five consecutive years of screening and testing in nine agro-ecological zones around the country by the FAO in close collaboration with field stations of the Agricultural Research Institute of Afghanistan (ARIA), two outstanding varieties have been identified and were presented to a special session of the Variety Release Committee at MAIL on 12 August 2008. The Committee approved the two varieties namely Dorokhshan-08 and Shesham Bagh-08 for release on the specific merits of high yield potential, tolerance to diseases and suitability for bread making, adding to the extremely limited number of improved spring wheat varieties available in Afghanistan. They will be particularly useful for farmers in high elevation cool areas who may not be able to plant their wheat crop in the autumn season because of time and water constraints. Until now, farmers in such locations are using mostly traditional varieties and are in extreme need of new improved materials to enhance their food production potential.

Following the release of these varieties, the project and the MAIL extension service will now endeavor in collaboration with seed

producers to publicize the new varieties in farming communities and make available sufficient quantities of quality seed within the shortest possible time. This is good news for Afghan farmers, and which will undoubtedly be greeted with joy in farming communities across the country. For more information, please contact: Assadullah Azhari, Information Officer, FAO Kabul Afghanistan; Tel: + 93-700-274 515; E-mail: [assadullah.azhari@fao.org](mailto:assadullah.azhari@fao.org)

### Ethiopia Step-up Off-season Seed Multiplication

Ethiopia's formal sector seed delivery is by far very low. The majority of farmers use their own saved seed or through local exchanges or buy from local markets. The Government of Ethiopia (GoE) was determined to expand the volume of certified seed delivery, but the availability of early generation seed remains a major constraint. Hence, the Ethiopian Institute of Agricultural Research (EIAR) embarked on increasing the volume of breeder and pre-basic seed by multiplying seed during the off-season.

A field day held from 8-9 May 2009 demonstrated the success of off-season seed multiplication at Debre Zeit, Melkasa, and Werer agricultural research centers aiming at narrowing the gap between demand and supply of early generation seed and possibilities for expanding to other research centers and sharing experience among EIAR communities. It was urged that all research centers to work diligently on pre-basic and basic seed multiplication along with agricultural research to ensure seed availability to expedite adoption of improved crop varieties.

The off-season seed multiplication was successful, which can be a good example for other research centers, to engage in efficiently multiplying seed on available experimental lands. Debre Zeit, Melkassa and Werer research centers have planted about 150 ha by irrigating from the Awash, Bedecha and Belbela rivers during the off-season, and multiplied seeds of wheat, tef, rice, maize, sorghum, chickpea, lentil, haricot bean, sesame and groundnut. Although the centers lack machinery (tractors, levelers, planters, water pumps, etc.), efficient water sources and adequate labor, the off-season seed multiplication experience was a success and rewarding for the institute and staff demonstrating the possibility of multiplying seed and conducting research all year around in

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Ethiopia, if available resources are adequately mobilized and used in the country. The field day provided an opportunity for experience sharing, expert opinion and discussion among researchers and partner organizations. An expert opinion on irrigated wheat production in the lowlands was raised as a successful farming in Ethiopian agriculture.

*Source: Mirimir Vol 8 No 11, May 2009*

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### **Pakistan Constitute National Seed Industry Association**

Pakistan seed industry has shown tremendous progress since the announcement of the national seed industry policy in 1994. Several regional or provincial seed associations were formed to represent the interests of the private sector, but remain scattered and less focused. Moreover, past efforts to form a national seed association failed due to lack of true representation of the private seed sector.

In a recent meeting it was agreed that regional seed associations consolidate their position by coming under one national umbrella organization, the Pakistan Seed Industry Association, with the following objectives:

- Promote and encourage high ethical standards in the conduct of the seed industry.
- Protect and represent the interests and activities of members of the seed industry by initiating and influencing decisions which affect them.
- Encourage production and use of high quality seeds and discourage the use of inferior seeds, promote export trade on seeds produced in Pakistan.
- Negotiate and cooperate with appropriate international or regional seed associations in the interest of its members.
- Assisting the government in matters relating to laws and regulations to settle disputes between members, promote and encourage plant breeding and research in the private sector.
- To organize seminars, conventions and workshops for its members and the stakeholders of the seed industry.
- To unite all firms companies, associations, corporations, scientists and persons handling the seed business in Pakistan.

- Helping members to get national and international training.

*Source: The Seed News, Vol 10 No 2, July 2008 - March 2009*

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### **Opportunities for Forage Seed Production in Pakistan**

In Pakistan, about 2.5 million ha of fodder crops are sown with an estimated 55.5 million tonnes of green fodder production. Punjab province alone plants 2.03 million ha producing 44.4 million tonnes (80%). Until the 1970s, Pakistan used to export berseem seed to neighboring countries, but following the interception of *Cuscuta*, the seed export was banned altogether.

To date, the country has become a net fodder seed importer. Despite the release of over 30 varieties, the seed production program is not yet well-organized resulting in high imports of fodder seed. In 2006/07, about 11,478 tonnes of fodder seed was imported at the value of RS 493.9 million to meet domestic demand.

There is great scope for domestic production and supply of fodder seed using the thousands of hectares of land of livestock farms across the country. The PSC has recently demonstrated the capacity to produce berseem seed locally. Moreover, a private seed company (High Sell Seed Company) has released the first hybrid sorghum (Sudum 99). Multi-national companies are also producing hybrid seed from exotic inbreds, although has not yet commercialized them, and the bulk of the seed needs continue to remain on the import list. It requires a political will and commitment to organize domestic fodder seed production.

*Source: The Seed News, Vol 10 No 2, July 2008 - March 2009*

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### **Turkey Established Umbrella Organization for the Seed Industry**

The Turkish Seed Industry Association (TÜRK-TED) was established in 1986 following the liberalization of the national seed sector in the country. The association was established to represent the interests of the domestic seed producers and continued its activities as the single representative body of the seed industry.

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It has served successfully as a forum between the industry and government over a long period of time and widely recognized as a representative professional organization in both domestic and international forum. It has also becomes a member of International Seed Federation and European Seed Association. It has about 90 fully integrated or partially integrated (e.g. marketing) member companies with major operations in variety development, variety adaptation trialing, seed production, seed processing, packaging, marketing, distribution, seed import/export of cereals (winter and warm-season), industrial crops, forage crops, vegetables, amenity grasses and ornamentals.

However, according to Seed Law No. 5553 of 2006, a new umbrella organization known as the Turkish Seed Union (Turk-TOB) was formed in 2008, representing the whole cross section of the seed industry from plant breeding to provision of seed and planting material industries. It is composed of several sub-unions including the Sub-Union of Seed Industrialists and Producers (TSÜAB formerly Turk-Ted), Sub-Union of Seed Growers, Sub-Union of Seed Distributors and Dealers, Sub-Union of Plug Plant Producers, Sub-Union of Nurserymen, Sub-Union of Ornamental Plant Growers and Sub-Union of Plant Breeders.

At present, there are institutional constraints which slow the smooth functioning of the privatization process in Turkey. Among these is lack of a functional coordination mechanism and consultation platform between the various public agencies and private sector with regard to the governance of the seed sector in general and preparation of seed regulations in particular. Although this has changed considerably after the reforms, many today believe that better collaboration between public agencies and the private sector will help accelerate the overall performance of the seed industry. In this regard the newly established Turkish Seed Union and its subordinate organs are expected to play a vital role in order to help develop effective interactions between the various stakeholders including the government, farmers, industry and consumers for the development of a truly competitive seed industry in Turkey.

Turkey is also hosting a special committee with the task of facilitating the establishment of a regional seed association, ECOSA. For more details, please contact Turkish Seed Union, Adakale Sokak No 22/12

Kizilay, Ankara, Turkey; Tel: +90 312 433 30 65; +90 312 433 30 66; Fax: +90 312 433 30 06;

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### **Accelerated Seed Multiplication to Counter Threats of Stem Rust (Ug99)**

#### *Background*

ICARDA and CIMMYT prepared a joint proposal for accelerated seed multiplication of promising lines (or released varieties) in selected target countries vulnerable to risks of stem rust (Ug99): Afghanistan, Bangladesh, Egypt, Ethiopia, Nepal and Pakistan. USAID has approved the project, from its Famine Fund, with major focus on accelerated seed multiplication for rapid deployment of stem rust resistant varieties. ICARDA is responsible for handling project activities in Egypt, Ethiopia and Pakistan, whereas CIMMYT is responsible for Afghanistan, Bangladesh and Nepal.

From the outset, the project focuses on four key components, which should run concurrently to ensure success, including:

- Identifying Ug99 and major rust resistant varieties in respective countries.
- Fast-track release of resistant varieties through dialogue with partners.
- Popularization and promotion of resistant varieties with farmers.
- Accelerated seed multiplication of promising lines (pre-release) and released varieties (large-scale) for distribution to farmers through formal and informal sectors.

#### *Project activities and implementation*

During 2008/09, a large number of promising Ug99 resistant lines identified by ICARDA and CIMMYT in partnership with NARS of respective countries, were evaluated for yield and tolerance to local races of three major rusts i.e. stem, yellow and leaf rusts in different agro-ecological regions. Apart from Ug99 resistance, it is becoming increasingly important that the new wheat varieties should have combined resistance to major rusts and other diseases of national importance, and better yielding particularly in the absence of the Ug99 in some countries. Moreover, pre-release seed multiplication of these lines was also initiated to ensure availability and access to seeds upon their final release.

In Egypt, two Ug99-resistant wheat lines (Lines 1 and 10) were identified with a yield of 8.05 and 7.94 t/ha, respectively, giving 150 and 40 kg/ha more yield over the highest yielding standard commercial variety Giza 168 (7.9 t/ha). The two lines were also resistant to major local wheat rusts. During a planning meeting with the Agricultural Research Center, the Central Administration for Seed Production (CASP), the Central Administration for Seed Testing and Certification (CASC) and ICARDA, it was agreed that these promising lines are recommended for release, popularization and large-scale accelerated seed multiplication in Egypt. It was also agreed that 42.23 t of seed multiplied by ARC through project support, is now provided to CASP, which will produce the seed on contract on state farms and contracted seed growers to produce large-quantity of seed in 2009/10. The two lines are now officially considered for release as Misr 1 and Misr 2.



*Wheat promising lines under multiplication in Sakha, Egypt (Line 1: top and Line 10: bottom)*

In Ethiopia, eight Ug99 resistant lines from ICARDA and CIMMYT will enter multi-

location advanced and adaptation trials during the main season in 2009/10, to facilitate fast track release. In the mean time, the Ethiopian Institute of Agricultural Research (EIAR) will initiate pre-release seed multiplication of these lines.

In Pakistan, six Ug99 resistant lines identified by the National Agricultural Research Center and the Ayoub Agricultural Research Center were evaluated under federal and provincial yield trails in 2008/09. Furthermore, seed of the resistant lines were multiplied at agricultural research centers and private seed companies. However, all six lines were found to be susceptible to the local race of stem rust, and in a recent meeting held in Pakistan, were withdrawn from further testing and release as well as seed multiplication. However, during the consultation meeting it was agreed to evaluate and pre-release seed multiplication of Ug99 resistant lines which are also found to be resistant to local stem races and other major rusts in the country during 2008/09.

ICARDA will continue providing the technical and financial support required through the existing USAID project.

## RESEARCH NOTES

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

### Knowledge and Innovation for Agricultural Development

*Kwadwo Asenso-Okyere and Kristin Davis<sup>2</sup>*

#### *Introduction*

Every day, millions of rural people who depend on agriculture, confront technical, economic, social, cultural, and traditional obstacles to improving their livelihoods. To cope with these obstacles, the rural poor draw on indigenous knowledge, and innovate through local experimentation and adaptation. Indigenous

<sup>2</sup> Kwadwo Asenso-Okyere is director of, and Kristin Davis is a research fellow in, IFPRI's Knowledge, Capacity and Innovation Division (formerly ISNAR Division), Addis Ababa, Ethiopia.

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knowledge alone, however, is not enough to deal with the complex problems facing the agricultural sector. Emerging issues such as high food prices, climate change, and demands for biofuels require complementary knowledge from formal agricultural research and development (R&D) and support from policies and other institutions. Formal and informal knowledge and innovation must therefore be linked to accelerate sustainable agricultural development.

Knowledge, defined as organized or processed information or data, is fundamental in the pursuit of innovation. For innovation to occur, knowledge must be created, accumulated, shared, and used. Innovations—new ideas, practices, or products that are successfully introduced into economic or social processes—can involve technologies, organizations, institutions, or policies. Innovation means putting ideas, knowledge, and technology to work in a manner that brings about a significant improvement in performance or product quality. Advancing agricultural development requires knowledge and innovation in several key areas:

- *Technology:* While many good technologies are “on the shelf”, emerging issues such as climate change require new research to develop drought-resistant, flood-resistant, and short-duration crop varieties.
- *Institutions:* More socio-economic research is needed to understand institutional constraints to innovating to improve livelihoods. Institutions are the system of rules that constitutes the environment within which innovations occur—laws, regulations, traditions, customs, beliefs, norms, and nuances of society.
- *Policies:* Appropriate, relevant, and timely public interventions are needed to promote and facilitate the creation, sharing, and use of knowledge for innovations.
- *Organizations:* Public and private groups and companies must innovate to become more effective and efficient in the services they provide.

To foster innovations in agriculture, policymakers must scale up investments in agricultural science and technology, research and extension, agricultural education and training, and farmer organizations and other local institutions—and do so in ways that will spread

advances in knowledge and innovation as widely as possible.

*The need for agricultural research and development*

Many past investments in agricultural research and development (R&D) have paid off handsomely. The *World Development Report 2008* provides evidence that investment in agricultural research resulted in an average rate of return of 43 percent in 700 development projects in developing countries. Other research has shown that for every 1 percent increase in agricultural growth, rural poverty falls by 1.83 percent, indicating an indirect link between agricultural R&D and poverty reduction. Using provincial-level data for China for 1970–97, researchers showed that the poverty reduction effect per unit of additional agricultural R&D investment ranked second only to investment in rural education. Studies by researchers from the Consultative Group on International Agricultural Research (CGIAR) show that the biggest payoffs for reducing rural poverty and increasing agricultural growth came from investments in agricultural R&D, education, and rural infrastructure, particularly roads. These investments must therefore be treated as a composite strategy for rural development.

In spite of high returns to investments in agricultural research, such investments are extremely low in the countries that have high rates of rural poverty. In low-income countries, agriculture is often the major source of people’s livelihoods. Yet according to the Agricultural Science and Technology Indicators (ASTI) initiative, agricultural research intensity—measured as public agricultural research spending as a share of agricultural gross domestic product (GDP)—was, on average, only 0.37 percent in 2000, compared with 0.67 percent for middle-income countries and 2.35 percent for high-income countries. Nevertheless, using intensity ratios as a rule of thumb is not always appropriate because they do not take into account the policy and institutional environment within which agricultural research takes place, or the broader size and structure of a country’s agricultural sector and economy.

Given that appropriate, science-based technology is a key driver of agricultural growth, the low level of agricultural R&D funding is a clear threat to much-needed future agricultural innovations in Africa, and other low-income countries. High food prices serve as an opportunity to increase investments in

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agricultural R&D so that desired increases in productivity and production become a reality.

*The innovation systems approach*

The conventional pipeline approach to agricultural research, technology development, and dissemination has produced numerous success stories, but it has serious limitations for broad-based, sustained agricultural growth and poverty reduction because it often ignores actors such as the private sector and does not always take institutions or local knowledge and preferences into account. Broad-based, sustained agricultural growth and poverty reduction require an interactive approach to agricultural development to bring in the relevant actors, organizations, and institutions, which all play a role in this process.

The innovation systems approach is one useful paradigm for these interactions. An innovation system is a network of organizations focused on bringing new products, new processes, and new forms of organization into economic use. The system includes the interactions between these organizations and the institutions and policies that affect their behavior and performance. An innovation systems approach considers innovation as a systemic process and recognizes that innovation can emerge from many sources, complex interactions, and knowledge flows.

The innovation systems approach moves away from a traditional linear research and development model in which research is completed and results are passed on to users through extension. Instead, it emphasizes the need to nurture the demand for knowledge and technologies among a range of actors, including farmers, researchers, extension officers, policymakers, private-sector companies, entrepreneurs, agro-processors, non-governmental agencies, and other intermediary organizations. The two-way flow of knowledge between these actors enables innovations to advance food and agriculture for better livelihoods for all.

To operationalize the innovation systems paradigm, the Forum for Agricultural Research in Africa (FARA) uses the Integrated Agricultural Research for Development (IAR4D) concept, which puts farmers and users at the center of innovative practices. The IAR4D encourages learning through the interchange of ideas, successes, and failures between stakeholders. The knowledge and

information held by farmers and other operators in the agriculture value chain must be strengthened to enable them to operate efficiently in the knowledge economy in a way that brings about increased income and reduced poverty. Despite the appeal of the innovation systems paradigm and the associated IAR4D, it is important that studies are carried out to find out how innovations actually occur along various value chains. This will help provide guidelines for improving agricultural research and systems to disseminate appropriate new technologies.

*Key policy options for promoting knowledge and innovation for agricultural development*

Developing-country governments face policy choices, and, with limited resources, they must make decisions carefully. Pragmatic policies and government actions can encourage actors in the food and agriculture value chain to create, accumulate, share, and use knowledge. Good policies will spur these actors to innovate, whereas bad policies discourage innovation in food and agriculture.

*Farmer-centered R&D:* As already stated, the evidence is clear that investment in agricultural R&D pays. Thus, as part of their poverty-reduction strategy, governments should invest in participatory agricultural research to help farmers innovate for increased productivity and production. Policy and institutional innovations can be used to motivate the private sector to undertake or finance agricultural research and to encourage commodity associations to allocate funds to research institutes or universities for commodity research. Policymakers can also provide incentives for agro-processing firms to establish laboratories to carry out or finance food research. Other policy innovations can include competitive grant schemes to direct research into areas of immediate need or prizes for outstanding research. Organizational innovations in research organizations can include a participatory research approach that brings in all of the actors in the food and agriculture value chain.

Working collaboratively, national agricultural research institutes, international research centers, farmers, and extension services have already produced numerous research results that have led to increased knowledge and innovation in agriculture. These results show the importance of focusing not just on technical,

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but also institutional, organizational, and policy innovations in getting research funded, organized, and implemented efficiently and getting the information shared among users to be processed for innovations.

For instance, the release of the New Rice for Africa (NERICA) quadrupled rice yields in many African countries, and improved maize varieties have increased yields from less than one metric tonne to more than four tonnes per hectare. Returns on new cotton varieties released in Senegal have been 34–37 percent. Investments in cocoa research in Nigeria led to the introduction of hybrid seed and effective control of the pests, capsid (an insect) and black pod (a fungus), producing annual returns of more than 40 percent. These technical breakthroughs required adaptation to the local level. They also required changes in organization and management, as well as in policies and institutions such as markets. Nevertheless, in some cases more needs to be done, to help farmers make productive use of technical innovations. Adoption of NERICA is still low. Many African farmers lack knowledge about the potential of the new rice variety or are discouraged by the additional labor it requires. Farmer adoption could still be increased through innovative extension mechanisms to educate farmers and provision of affordable credit to allow farmers to hire labor.

In Kenya, the average bunch weight of bananas increased from 15–30 kg to more than 40 kg; with a combination of factors leading to this improvement. The technical aspects of tissue culture and banana-ripening boxes played a part. Just as important, however, were the provision of market information and channels to producers.

*Agricultural extension:* Agricultural extension is an important player that can bring together research, farmers, and other players in the innovation system. Extension is defined as the services that support people engaged in agricultural production to help them solve problems and obtain knowledge, information, skills, and technologies to improve their livelihoods and well-being. Extension approaches have evolved from ministerial departments to national extension systems; to the training-and-visit system; to privatized (and otherwise reformed) systems. What matters is not so much the approach or system, but rather whether it offers a “best-fit” solution to local needs and conditions. Technologies,

information, and skills that do not take users into account or do not reach users lose their desired impact.

Many farmers complain about the ineffectiveness of extension services, which are viewed as supply-driven, highly centralized, non-participatory systems that exclude the poor. For example, worldwide, women farmers receive only 5 percent of extension services, whereas research has shown that farm productivity increases by 22 percent when women receive the same advisory services as men. Public extension must enact technical, institutional, and organizational reforms to make it more cost-effective, demand-driven, and participatory.

Advances in information and communication technologies offer opportunities for technical changes from which both extension staff and their clientele can benefit. Mobile phones and Internet kiosks provide quick and affordable channels for relaying agricultural advice. Mobile phones can give extension staff a way to offer advice to producers who cannot read or write. A handset’s photo and video-recording functions are useful for explaining a technique and sharing other information. In Kenya, a new system that reads out text via mobile phone is helping banana producers. This Banana Information Line, a boon to illiterate farmers, is available in Kiswahili and English and helps users troubleshoot banana cultivation problems. In Sierra Leone, mobile phones supplied by a project on ginger links agronomists and extension workers. Providing mobile phones to agronomists, extension workers, and farmers can be a cost-effective means of sharing information among these three groups.

Within extension, institutional and organizational changes are also required, so that the service goes beyond technology transfer to facilitation and beyond training to learning. It must include processes such as assisting with the formation of farmer groups, dealing with marketing issues, and partnering with a broad range of service providers and agencies.

Institutionally, extension can benefit from other organizations and processes that promote the spread of information. Informal extension, through social networks and knowledge spillovers, offers opportunities to reach farmers. Farmers meet at social functions and discuss issues of concern. They learn from each other through such interactions, and knowledge is carried from one community to another.

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Commodity associations and markets are also instrumental in disseminating production and marketing information to their members—the Kenya Agricultural Commodity Exchange (KACE) and the Ethiopian Commodity Exchange (ECX) are good examples.

*Education and capacity strengthening:* Capacity strengthening is a key policy priority for stimulating knowledge and innovation. Innovation system actors and organizations require strengthening at many levels in order to work more effectively. Farmers and farmer organizations require strengthening—for instance, establishing successful demand-driven extension services requires strengthening users' capacity to demand the types of services they need. Organizations (public sector, private sector, or civil society) that provide extension services demanded by users must also be trained to respond to users' needs. Researchers need to learn how to work with farmers and communicate with extension workers. And policymakers need to better understand the innovation system and its different components.

For decision makers, the key question is where to spend scarce resources on capacity strengthening: at the government level; at the level of research, education, and extension organizations; or among farmers and their organizations. Priorities depend on local conditions, such as socioeconomic level, governance structures, political system, and availability of infrastructure. All stakeholders need to participate in setting priorities.

#### *Organizational and institutional innovations*

Organizations and institutions that guide the performance, outcomes, and impact of the agricultural sector must be more innovative to be more efficient and effective. National research organizations, extension organizations, community and farmer based organizations, and rural service providers within the food and agricultural value chain must be strengthened to enable them to innovate and function efficiently. To manage for impact, these organizations must be able to set long- and short-term strategic objectives, set priorities, and establish an organizational performance assessment system to guide the innovation processes they are involved in.

The institutional setting shapes the processes critical to an innovation system—that is, interactions, knowledge sharing, and

continuous learning to bring about changes in a desired direction. It is important to carry out institutional analysis with respect to innovations, addressing questions that include the following:

- How do innovations come about?
- Which actors are involved in the innovation system and what roles do they play?
- What are the “rules” that guide the behavior and practices of actors?
- How are smallholders engaged in, and affected by, a process of institutional learning?
- What are the economics of these investments?

Actors in the food and agriculture value chain must understand the laws, regulations, traditions, customs, beliefs, norms, and nuances of society that prohibit, permit, or require certain actions. For instance, the availability of intellectual property rights promotes inventions or new ideas; security of land tenure encourages investment in land; certain belief systems tend to discount new knowledge and therefore fail to promote innovation; other customary and traditional practices may prevent societies from making progress in productivity-enhancing ventures. On the other hand, practitioners have found that some traditional institutions provide a good entry point into communities; for instance, traditional savings-and-loan groups provide a venue for promoting new technologies.

#### *Conclusion*

In a dynamic world, innovations are important to remain competitive, protect the environment, keep pace with development, and improve well-being. Innovations do not occur in a vacuum, however. They occur when innovators acquire knowledge and process it to come up with new ideas, practices, or objects that can be successfully introduced into economic or social processes.

Knowledge is central to development and likely to become more so. In the 21<sup>st</sup> century, knowledge accumulation and application will drive development processes and create unprecedented opportunities for growth and poverty reduction. Knowledge must therefore be created, accumulated, and managed to be useful for innovation. In an era of globalization and rapid change, decision makers should promote innovation in organizations,

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institutions, and policies to bring about outcomes where knowledge can be taken up, adapted, and implemented to promote development.

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*Source: IFPRI Policy Brief 11 March 2009.*

## MEETINGS AND COURSES

**A**nnouncements 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

**Second World Seed Conference, 8-10 September 2009, FAO, Rome.** The conference under the theme 'Responding to the Challenges of Changing world-the role of new plant varieties and high quality seed in agriculture is jointly organized by FAO, OECD, UPOV, ISF and ISTA. This event is aimed at a cross section of the seed industry from policy makers and senior managers of government agencies to professionals such as plant breeders, seed specialists, researchers to farmers' associations and consumer organizations. It also include breeding companies, breeders' associations, certification agencies, seed producers, seed trade associations, technology companies, academic institutions, and international breeding and seed research centers. The conference will be held over three days, organized into two events: Expert Forum, 8-9 September 2009 and Policy Forum, 10 September 2009.

The aim of the Expert Forum is to provide information and facilitate discussion on means of encouraging the development of new plant varieties and the production and distribution of high quality seed. The Policy Forum will review the conclusions of the Expert Forum on means to provide an enabling environment that encourages the development of new varieties and facilitates the production and distribution of high quality seed.

The Expert Forum will be in English only whereas the Policy Forum will have

simultaneous translation in Arabic, Chinese, English, French and Spanish. Further information on the conference can be obtained at: <http://www.worldseedconference.org>.

**International Conference on Food Security and Climate Change in Dry Areas, 12-15 October 2009, Amman, Jordan.** An International Conference on Food Security and Climate Change in Dry Areas, organized by the International Center for Agricultural Research in the Dry Areas (ICARDA) and Jordan's Ministry of Agriculture, will be held 12-15 October 2009 in Amman, Jordan. Conference themes include impacts of climate change on natural resource availability, agricultural production systems and environmental degradation in dry areas, mitigation, adaptation and ecosystem resilience strategies: natural resource management, crop improvement, etc, and policy and institutional options to ensure an enabling environment to cope with climate change impacts. For more information, please contact [n.haddad@cgiar.org](mailto:n.haddad@cgiar.org) or visit the website ([http://www.icarda.org/Announcement/2009/IntlConfnc\\_FoodSecurity/FoodSecurityAndClimateChangeInDryAreas\\_2009.htm](http://www.icarda.org/Announcement/2009/IntlConfnc_FoodSecurity/FoodSecurityAndClimateChangeInDryAreas_2009.htm)).

**International Conference on Food Security in the Arab Countries: New Challenges and Opportunities in the Context of Price Volatility, 2-4 of March 2010, Muscat, Oman.** The objective of this conference is to bring together researchers, experts, policy makers and other practitioners from the Arab region and the world to present and discuss food security in its domestic and international dimensions and in the light of the recent global food crisis. The organizing committee welcomes conceptual and empirical research papers as well as case studies on food policies of particular Arab countries to alleviate the effects of the global price surge.

The Conference will be held at Sultan Qaboos University (SQU), the premier university in the Sultanate of Oman. For more information please contact: Dr Houcine Boughanmi, Department of Natural Resource Economics, College of Agricultural and Marine Sciences, Sultan Qaboos University, PO Box 34, Al-Khod 123, Oman; Tel: +968-2414 1243/968-24141244; Fax: +968-244-13418; E.mail: [boughanh@squ.edu.om](mailto:boughanh@squ.edu.om).

**International Seed Testing Congress 2010, 16-22 June 2010, Cologne, Germany.** This is a

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triennial congress organized by ISTA Secretariat. During the Congress, the 29th ISTA Seed Symposium will be organized from 16-18 June 2009 under the theme *Application and improvement of established and advanced technologies in seed testing*. The Symposium will be made up of five oral sessions and two poster sessions, each of 2 hours, covering the same topics. A lead speaker who is well known in the field of seed science and technology will chair each oral session.

Intending participants are encouraged to present oral and poster papers dealing with a range of topics under five themes. The research reported in offered papers can cover both the scientific basis of aspects of seed quality and its technological application in seed testing. In all sessions, we welcome papers based on both established seed testing methods and those using new or advanced technologies such as automated and computer-based methods and non-destructive techniques. Papers may be on crop species, flowers, trees and shrubs and new and potential cultivated species. We encourage papers on both tropical and temperate species.

Papers should be submitted online only in the form of an abstract in English of 1600 characters (maximum). Papers will be presented orally and in poster form in English, both forms having equal status. As the number of oral presentations will be limited by time constraints, oral presentation of your paper may not be possible and you may be asked to present your paper as a poster. The selection of papers for oral presentation will be by the Scientific Program Advisory Committee.

The timetable for submission and acceptance of papers is as follows:

*October 2008*: First call for papers.

*15 July 2009*: Deadline for submission of papers. Papers reviewed by the Scientific Program Advisory Committee.

*17 September 2009*: Authors of papers considered for oral presentation contacted for further information on experimental results, additional to the abstract.

*1 November 2009*: Authors informed whether papers have been accepted for oral or poster presentation.

*1 March 2010*: Deadline for payment of registration fee for authors of accepted oral papers. If the presenter of an oral paper has not registered, the paper will be replaced in the program and deadline for acceptance of an invitation to present an offered oral paper as a poster

*2 April 2010*: Deadline for payment of registration fee for authors of accepted poster papers. If none of the poster authors has registered by this time, it will not be possible to present the poster and the abstract will not be published.

Authors of proposed papers are encouraged to explore possible sources of funding for their attendance at the symposium as early as possible. ISTA cannot offer any financial support to authors of papers. However, a letter of acceptance of a paper for presentation (subject to funding) can be provided to assist in funding applications after 1 November 2009.

#### **ISTA Workshops**

*ISTA Workshop on Quality Assurance in Seed Testing*, 19-23 October 2009, Palmerston North, New Zealand. For more information visit: <http://www.seedtest.org/en/workshopdetail---1--1113--210--74.html>

*ISTA Workshop on Variety Testing - an introduction, using protein electrophoresis and Polymerase Chain Reaction (PCR) for GMO Detection*, 9-13 November 2009, Indo-American Hybrid Seeds (India) Pvt. Ltd, Bangalore, India. For more information visit: <http://www.seedtest.org/en/workshopdetail---1--1113--210--76.html>

*ISTA Seed Health Workshop*, 2-5 March 2010, GEVES-SNES, Angers, France. For more information visit: <http://www.seedtest.org/en/workshopdetail---1--1113--210--75.html>

*ISTA Workshop on Species and Variety Testing / Proteinelectrophoresis*, 11-13 June 2010, Bundessortenamt (Federal Plant Variety Office), Hanover, Germany. For more information visit: <http://www.seedtest.org/en/workshopdetail---1--1113--210--78.html>

*ISTA Workshop on Viability and Germination Testing*, 9-14 June 2010, Landwirtschaftliches Technologie Zentrum (Agricultural Technology

Park) Augustenberg, Karlsruhe, Germany. For more information visit:  
<http://www.seedtest.org/en/workshopdetail---1--1113--210--77.html>

### Courses

**UPOV Distance Learning Course DI-205:** Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention, 2 November to 6 December 2009. For on-line registration, please visit the website (<http://www.upov.int/en/about/training.html>)

## LITERATURE

**B**ooks 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

**Sperling L. 2008. When Disaster Strikes: A Guide to Assessing Seed System Security, CIAT, Cali, Colombia.** When disaster strikes

(droughts, floods, locusts, civil war, tsunamis, etc), threatening lives and livelihoods, humanitarian agencies must respond swiftly and decisively. Making sure people have

enough to eat is usually at the top of the list of emergency measures. But that task invariably raises the important issue of seed supplies. Will farmers in the stricken area have enough seed to plant during the next growing season?

*When Disaster Strikes: A Guide to Assessing Seed System Security* is a practical assessment tool. It will help emergency relief agencies and their field workers to decide whether a seed-related intervention is warranted in the first place, and if so, to



design the best strategy to help farmers. The method is laid out in seven steps. Each includes how-to notes, guiding questions, and action checklists. Besides helping agencies understand and cope with acute stresses on seed systems, the guide also tackles the issue of longer-term stresses and how to take advantage of development opportunities. Download the manual at: [http://www.ciat.cgiar.org/africa/pdf/sssa\\_manual\\_ciat.pdf](http://www.ciat.cgiar.org/africa/pdf/sssa_manual_ciat.pdf).

**Erskine, W., F. Muehlbauer, A. Sarker, and B. Sharma. (ed). 2009. The Lentil: Botany, Production and Uses.** The lentil with its ancient origin is today very much a crop of the modern world confronted with issues of food security, poverty, water scarcity and the need to find sustainable agricultural systems in a changing climate. In the last three decades the global production of lentil had almost tripled due not only to larger harvest areas but also and more importantly to an increase in productivity. The Lentil provides a timely synopsis of the current knowledge associated with this highly digestible and protein-packed grain with its ability to use water efficiently and to grow in marginal environments. This book will be of interest to those working in horticulture, agronomy and botany with a particular focus on lentils. CABI, ISBN 9781845934873; 480pp; Price: \$190.00

**Tripp, R. (ed.) 2009. Biotechnology and Agricultural Development: Transgenic Cotton, Rural Institutions and Resource Poor Farmers.** This book addresses the continuing controversy over the potential impact of genetically modified (GM) crops in developing countries. Supporters of the technology claim it offers one of the best hopes for increasing agricultural production and reducing rural poverty, while opponents see it as an untested intervention that will bring corporate control of peasant farming. The book examines the issues by reviewing the experience of GM, insect-resistant cotton, the most widely grown GM crop in developing countries.

The book begins with an introduction to agricultural biotechnology, a brief examination of the history of cotton production technology (and the institutions required to support that technology), and a thorough review of the literature on the agronomic performance of GM

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cotton. It then provides a review of the economic and institutional outcomes of GM cotton during the first decade of its use. The core of the book is four country case studies based on original fieldwork in the principal developing countries growing GM cotton (China, India, South Africa and Colombia). The book concludes with a summary of the experience to date and implications for the future of GM crops in developing countries.

This review challenges those who have predicted technological failure by describing instances in which GM cotton has proven useful and has been enthusiastically taken up by smallholders. But it also challenges those who claim that biotechnology can take the lead in agricultural development by examining the precarious institutional basis on which these hopes rest in most countries. The analysis shows how biotechnology's potential contribution to agricultural development must be seen as a part of (and often secondary to) more fundamental policy change. The book should be of interest to a wide audience concerned with agricultural development. This would include academics in the social and agricultural sciences, donor agencies and NGOs. Amazon.com, ISBN-10: 0415543843, 280 pp, Price: \$30.33.

**Wesley E. and F. Peterson. 2009. A billion dollars a day.** If agricultural development is to succeed through fairer international trade rather than aid, it will only happen with the reduction or elimination of agricultural subsidies paid by governments to farmers in the wealthier nations. These subsidies in North America, Europe, Oceania, Korea and Japan amount to some one billion dollars a day - the title of this book. The book provides a detailed study of the history of subsidies, current policies that continue to support them, and their impact on farmers in the developing world.

The study is certainly detailed but, although aimed at the general reader as well as the economist. An important subject, undoubtedly complex, comprehensively presented, but not an easy read. Wiley-Blackwell, ISBN 978-1-4051-8586-8(Pb); 292pp; Price: £17.99

#### Useful Websites, Journals, Newsletters

##### *Harvest Choice*

The HarvestChoice initiative has launched a comprehensive collection of data products designed to better inform strategic policy and

investment decisions aimed at improving farm productivity and profitability, and market development. The website is intended to be the "go-to" resource for analysts and decision makers seeking integrated, consistent, and spatially referenced information, provided in an interactive portal. The data collection focuses on factors relevant to crop production and marketing in Sub-Saharan African (SSA) agriculture, such as climate, soil and pest conditions and constraints, current and future cropping systems geography and performance, and access to markets. Recognizing the site-specific nature of many interventions designed to boost productivity, especially in the rainfed systems common throughout SSA, HarvestChoice takes a spatial approach, using interfaces built around open-source platforms such as Google Maps. By providing both public and private investors with an increasingly broad and in-depth understanding of major production and marketing challenges and opportunities, HarvestChoice hopes to shed light on the potential payoffs to productivity-enhancing innovations for smallholder farmers, as well as how to promote the commercialization of smallholder agriculture. The HarvestChoice website will continuously be updated and improved over time. To view the website and download these early data offerings, visit: <http://www.harvestchoice.org>

##### *ILAC*

The Institutional Learning and Change (ILAC) Initiative has launched its new interactive website. You are invited to visit the site, specially the section 'resources', where you can find important methods for evaluation and impact of collaborative projects. ILAC Library section covers over 1200 references related to participatory research, monitoring and evaluation, impact assessment, organizational learning and much more. You can sign up for receiving ILAC news at the link is [www.cgiar-ilac.org](http://www.cgiar-ilac.org). For more information you may contact: Cristina Sette, Program Specialist, ILAC Initiative, c/o Bioversity International, Via dei Tre Denari 472a 00057 Maccarese (Fiumicino), Rome, Italy; Email: [c.sette@cgiar.org](mailto:c.sette@cgiar.org)

#### New Journals

##### *Genetically Modified Crops*

In July 2009, GM Crops, the first international peer-reviewed journal of its kind will be

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launched to focus exclusively on genetically modified crops. Genetic engineering techniques and applications have developed rapidly since the introduction of the first genetically modified plants in the 1980s. There has been a rapid increase in GM crop R&D by academia, government and industry around the world. GM crops are useful to consumers, farmers and the environment and are growing in popularity worldwide.

GM crops are needed to tackle the food needs of a growing population. Crops with improved agronomic characteristics can provide protection against many of the biotic stresses caused by weeds, pests, and diseases currently experienced in developing countries. Also, GM crop R&D is focused on the development of more complex traits, such as drought resistance and the development of foods with enhanced nutritional value which may provide a low-cost way of dealing with widespread malnutrition problems.

Because GM crops can address key challenges in the food and agricultural sector, it is expected that the number of GM crops ready for commercial release in many countries will expand considerably over the next few years. Genetic modification is a tool integrated into a

wider research agenda, where public and privatscience can balance each other. Scientists in both the public and private sectors regard the GM process as a major new set of tools to improve crop traits, while industry regards it as an opportunity for increased profits. Genetically modified crop varieties allegedly provide farmers with various agronomic benefits, but serious environmental, health and ethical concerns also are being raised.

All of these issues will be addressed in *GM Crops*, through original research, timely reviews and commentaries. For more information, please contact: Dr Naglaa A. Abdallah, Editor-in-Chief, Cairo University, Cairo, Egypt or visit [http://www.landesbioscience.com/journals/gm\\_crops/](http://www.landesbioscience.com/journals/gm_crops/).

#### **Seed Newsletter**

Seed News is the seed industry publication in Brazil covering all subjects related to seed technology. It is published bimonthly in Portuguese, Spanish and English and distributed via e-mail. To date the newsletter is distributed mostly in the Americas, but also in Africa, Asia and Europe and Australia. Seed News is available to readers worldwide via the Internet (<http://www.seednews.inf.br/>). Please, send your inquiries to: [seednews@seednews.inf.br](mailto:seednews@seednews.inf.br).

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**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.**

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# First ECOSA International Seed Trade Conference (ECOSA2009)

## Invitation

The First ECOSA International Seed Trade Conference (ECOSA2009) will be held from 2-4 December 2009 in Antalya, Turkey. The conference will be organized by the Turkish Seed Union (Turk-TOB) and the Ministry of Agriculture and Rural Affairs (MARA) and their partners the Turkish International Development Agency (TIKA), the Economic Cooperation Organization (ECO), the Food and Agriculture Organization (FAO) and the International Center for Agricultural Research in the Dry Areas (ICARDA). ECOSA2009 will cover a broad range of issues of interest in the seed trade and the global seed industry. It will provide an opportunity to promote your business at a global level in general and ECO region in particular and keep abreast with the current developments in the industry. The focus of the first conference will be seed trade including exploring the status and prospects of seed industry; opportunities in the seed market; and international seed regulations and conventions of relevance to the ECO region.

## The Venue

The conference will be held at the Fame Residence Lara & SPA 12 km from the airport in Antalya, the resort and beautiful city of Turkey. Luxury and comfort combined with excellent service and peaceful atmosphere make this hotel attractive during your stay in Turkey. For more information on the hotel, please visit the website (<http://www.famehotels.com/>). For more information on Antalya city, visit some of the links (<http://www.antalya.org/>).

## The Conference

ECOSA 2009 is aimed at exploring and promoting seed trade within the ECO region and beyond. The ECO region encompasses 10 member countries with an area of 800 million ha and population of more than 350 million people with a rich variety of agro-climatic conditions suitable for agricultural and horticultural crop and livestock production. Agriculture has a significant share in GDP of the ECO countries ranging from 11-50% and employing 39% of economically active population. There is great potential for agricultural expansion and diversification bringing opportunities for the seed sector. The Conference will provide a forum to promote regional seed trade among seed companies within and outside the region and to share experiences among stakeholders of the seed industry. Conference participants will come from the private sector (seed companies, agricultural input suppliers, seed equipment manufacturers), public sector, international/regional/national seed trade associations and international/ regional development organizations working on seeds.

## Exhibition and Trading Rooms

A booth (2.4 m x 1.5 m, with one table and two chairs) will be available for companies (seed companies, seed equipment manufacturers, agricultural input providers, agricultural machinery manufacturers, etc) who wish to exhibit their products. The fee is €400 for ECOSA members, €500 for ECO member countries and €600 for other companies including registration for one person to attend the conference. Additional area can be rented at €150 per m<sup>2</sup>.

## Conference Website and Registration

For more information on the conference, please visit the official conference website at: <http://www.selenet.com/demo/ecosa/> (English, Turkish or Russian)

## Conference Secretariat

For any further information, please contact: Turkish Seed Union, Adakale Sokak, No 22/12, Kizilay, Ankara, Turkey; Tel: +90 312 433 30 65; +90 312 433 30 66; Fax: +90 312 433 30 06; E-mail: [ustun05@gmail.com](mailto:ustun05@gmail.com)

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