SEED INFO

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EDITORIAL NOTE

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

The WANA Seed Network provides information on activities relating to global and/or regional cooperation and collaboration to facilitate the development of a vibrant regional seed industry. In this issue of *Seed Info*, we report on the regional seed courses organized by the International Center for Agricultural Research in the Dry Areas (ICARDA) and the activities of the FAO sub-Regional Office for Central Asia's (FAO-SEC's) project, *Seed sector development in countries of the ECO*. The FAO-Turkey Partnership Program (FTPP) and Economic Cooperation Organization (ECO) jointly funded this project. The FAO-SEC project seeks to foster regional seed sector development of ECO member countries by developing a harmonized regulatory framework and regional seed policy. We also report on a regional seed policy workshop held 5–7 January 2015 in Istanbul, Turkey, and the Turkish Seed Trade and Fairs of 7–9 January 2015, organized by the Turkish Seed Association.

In the **NEWS AND VIEWS** section, Niels Louwaars from the Dutch Seed Association, Plantum, presents an article entitled *Plant breeding: open borders for private investments*. The article highlights the important role of plant breeding in variety development and progress of the national seed industry. Crop improvement requires both genetic resources and knowledge to serve farmers with better varieties. These two determining factors are in the hands of both public sector and private sector breeders. Policy makers in some countries want to stimulate national plant breeding by putting severe limitations on foreign nationals investing in plant breeding, but this restricts the sharing of good varieties. Plant breeders know that such political views are not optimal for providing farmers with good varieties and seeds. It urges countries to have an open door policy for private sector plant breeding. This may ensure the flow of germplasm and facilitate farmers' access to the latest technologies. It will also encourage the private sector and spur investment. Other news in this section comes from regional and/or international organizations, such as the International Union for the Protection of New Varieties of Plants (UPOV), ICARDA, and the International Maize and Wheat Improvement Center (CIMMYT).

The section on **SEED PROGRAMS** includes news from Afghanistan, Ethiopia, Iraq, Pakistan, and Uzbekistan. There are also reports on the release of chickpea and lentil varieties by the Agricultural Research Institute of Afghanistan (ARIA) from the productive partnerships with ICARDA. It is expected that seed of these new high yielding and (a)biotic stress tolerant varieties will soon become available to farming communities at large. They will help to increase agricultural production and productivity and ensure food and nutritional security in the country. From Ethiopia, we report on the initiative addressing the value chain of durum wheat by the Ethiopian Institute of Agricultural Research (EIAR) and ICARDA. This USAID-funded seed project established another milestone by bringing together value chain actors to revive durum wheat production and connect farmers with markets in the fight against wheat rusts.

The **RESEARCH** section of *Seed Info* captures information on adaptive research or issues relevant to developing seed programs in the CWANA region and beyond. This issue features an article entitled '*Farmers' knowledge and use of malt barley varieties and seed quality perceptions in southeastern Ethiopia'* by Karta Kaske, Astawus Esatu, and Abebe Atilaw, from the Ethiopian Agricultural Research Institute. The paper discusses farmer's knowledge and use of malt barley varieties in southeastern Ethiopia. The study identified seed shortage as a major problem and recommended promotion of new varieties to boost malt barley production in the region.

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

Happy New Year

Zewdie Bishaw, Editor

WANA SEED NETWORK NEWS

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

ICARDA organizes seed courses

ICARDA continues to provide short-term and long-term seed courses to strengthen the capacity of the human resources of the national seed sector through special projects. By conducting these courses at the regional level, ICARDA brings together NARS from the various sub-sectors of the national seed sector.

Variety maintenance & quality seed production

The African Development Bank (AfDB) is funding a project '*Support to agriculture research for development on strategic c*rops (SARD-SC)'. The project focuses on such crops as maize, wheat, rice, and cassava to ensure greater food security and economic growth in the limited-income African countries of sub-Saharan Africa. The project has three main components: generation of new wheat technologies and innovations; sustainable dissemination and adoption of existing and new wheat technologies and innovations; and sustainable capacity strengthening of stakeholders. ICARDA is implementing the wheat project and has developed a framework for fast-track testing and accelerated seed multiplication, through formal and informal approaches, to make the seed of newly released varieties available to farmers.

Within the context of strengthening NARS' capacity, ICARDA is organizing specialist courses in seed technology. These courses will promote accelerated seed multiplication by NARS, public and private seed companies, and farmers. To strengthen NARS' capacity in the partner countries, ICARDA planned three regional seed courses in the hub countries. The third course was organized for 13–17 October 2014 at Kulumsa Agricultural Research Center, Arsi, Ethiopia.

Course objectives and contents

The main objective of the course was to provide participants with theoretical knowledge and hands-on practical skills focusing on two modules: (i) wheat variety maintenance and quality seed production and (ii) wheat quality seed production for accelerated variety dissemination and adoption with farmers at innovation platform (IP) sites.

The technical staff of the NARS and partner institutions acquired knowledge and skills in variety testing and release, variety identification, variety maintenance, and accelerated seed production. Partner institutions at IP sites (development offices, extension services, and farmers) understood the concept of community seed production and its establishment and operation. Hands-on practical sessions and visits to fields and/or laboratories followed the theoretical lectures. These provided a better understanding of the theory and allowed acquisition of the necessary skills.

The course started with an overview of seed program components and functions and moved from there to seed quality components and their measurements and significance in crop production. A detailed presentation on the principles, procedures, and techniques of wheat variety identification and variety maintenance as well as pre-basic, basic, and certified seed production for technical staff from partner institutions, followed. During the course, the participants visited sites illustrating the different stages of variety development (from crossing blocks to handling of segregated populations). They saw the different stages of national wheat yield trials, including verification trials for release purposes. In addition, the participants visited a variety of maintenance plots where they experienced hands-on practical training.

During the last two days, emphasis was given to community seed production and marketing. For this, farmer seed producers from different IP sites joined the first group. The concept of farmer-based seed production was introduced, including the feasibility and sustainability of local seed businesses. The course covered the principles and techniques of quality seed production and followed this with open discussions with farmers. Field visits were made to the seed production sites of farmer' association.

Course participants

The course participants included employees from the NARS who dealt with agricultural research and breeder seed production, public and private seed companies involved in certified seed production, quality assurance agencies, extension and agricultural development officers, facilitators, and farmers from IPs.

In Ethiopia, the course was organized for the highland hub countries of east and south Africa. In total, 37 technical staff – 29 from Ethiopia and 2 each from Kenya, Tanzania, Zambia, and Zimbabwe – attended the course.

The participants were from research centers, seed enterprises, and extension services, and included IP site facilitators. Of the participants, eight (22%) were female (four from Ethiopia and one each from the other participating countries). They are involved in the key components of their national seed systems – agricultural research, seed production, and seed quality assurance – and as farmers.

In addition, 11 farmers, who are involved in on-farm seed multiplication in wheat IPs in Ethiopia, attended the course. The farmer participants came from the five wheat IPs established by the project in Amhara (Enemay and Shebelberenta), Oromia (Gololcha and Sinana), Southern Nations, Nationalities and Peoples' Region (SNNPR) (Gedabano, Gutazer, Wollene), and Tigray (Ofla) regions.

Participants of seed course (top left) visit breeder seed production plots (top right), Gonde-Ethaya basic seed farm (bottom left) and on-farm seed production fields (bottom right)

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Variety maintenance and community-based seed production and marketing

ICARDA is implementing several research for development projects supporting commodity programs and natural resources management. These include food legumes in Morocco (Office Chérifien des Phosphates Foundation), Conservation Agriculture in Iraq (ACIAR), wheat-legume based cropping systems (EU-IFAD), Food Security for Arab Countries (Arab Fund) and the CGIAR Research Programs (CRPs) on Dryland Cereals and Dryland Systems.

Access to quality seed for wider adoption and for assessing the effects of investments on agricultural research for development are key elements of all commodity-based CRPs and bilateral projects. The major bottleneck in national seed systems, in general, and for legumes in particular, is the lack of functional variety maintenance units to move new varieties out of the research stations into farmers' fields at a price that they can afford and are willing to pay.

To guarantee a sufficient supply of quality seed at the right place, time, and price, specialized national seed organizations have been established in almost all countries. However, to meet the challenges of quality, efficiency, effectiveness, and financial viability the national seed sectors need to undergo policy reforms to bring greater diversity and decentralization into the seed supply system. These countries are facing great challenges in diversifying their seed sectors to ensure the active participation of the national and international private seed sector to broaden the scope of the public sector dominated national seed programs. To meet these challenges, human resources development plays a crucial role.

ICARDA and its national partners organized a training course on variety maintenance and community-based seed production and marketing. The training was to encourage wider adoption and to assess the impact on and return on investments in variety development.

The course provided the participants with practical experiences on (a) accelerated source seed multiplication of newly released and promising varieties of food legumes and cereals for further multiplication and distribution to farmers and (b) community-based seed enterprise development and management for large-scale seed production and marketing.

Course objectives and contents

The course consisted of two modules of one week each. The first on variety maintenance and quality seed production ran 21–26 April 2014. The second addressed community-based seed production and

marketing from 28 April to 2 May 2014. The first module targeted technical staff from research and seed production and certification departments in the partner institutes, and pioneer farmers. The course content covered introduction to variety improvement, techniques of variety evaluation, variety maintenance, and certified seed production by public and private seed producers. It also considered quality seed production and marketing by pioneer farmers or farmer groups for accelerated variety dissemination and adoption.

The second module was on community seed production and marketing. It was designed to provide pioneer farmers and the technical staff supervising them with necessary skills in business planning, bookkeeping, seed marketing and promotion, and the profitability and sustainability of the seed enterprises.

The course comprised classroom lectures, group sessions, and technical visits to variety improvement, evaluation, and release facilities, seed quality control, quarantine clearance and certification laboratories, seed processing, storage, and marketing facilities, farmer cooperatives, and farmer-based seed multiplication fields.

Course participants

The seed course was attended by 37 participants drawn from 7 countries –Algeria 1, Iraq 7, Jordan 2, Morocco 25, Sudan 1, and Tunisia 1. The participants were research technicians involved in crop improvement and seed production, processing, and certification. Among the Moroccan participants, 15 were lead farmer seed producers.

Participants of the seed course (top left); visit to variety maintenancee plots (top right); visit to cooperative seed production fields (bottom left); and practical seed demand assessment with farmers (bottom right)

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Regional seed project for ECO member countries

Within the framework of the regional project *Seed sector development in countries of the ECO* (GCP/INT/123/MUL), funded jointly by (FTPP) and ECO, FAO-SEC is conducting a series of regional and national workshops on the implementation of the project.

National seed policy workshops

Several national workshops on seed policy that were organized across ECO member countries during 2014, led to a regional consultation meeting in early January 2015.

Uzbekistan

The National Seed Policy Workshop was held 26 June 2014 in Tashkent, Uzbekistan. About 34 participants, representing different stakeholders, attended the workshop. The main purpose of the workshop was to bring together all the stakeholders to consider and discuss the draft *Concept for the development of the seed sector of Uzbekistan.* The participants approved the project, with some amendments and suggestions being made at the meeting.

Turkey

The National Seed Policy Workshop was organized with the support of FAO-SEC and in cooperation with the Ministry of Food, Agriculture, and Livestock (MoAL) on 26 September 2014 in Ankara, Turkey. More than 60 participants attended the workshop representing the public and private sectors. The goal of the workshop was to discuss the outcomes of the study on the seed sector and formulate the national seed strategy.

The participants made the following recommendations for the development of the seed sector:

- Representatives of the private and public sector to prepare the 'National Seed Strategy' paper
- Encourage harmonization of variety registration among ECO countries to develop the regional seed trade. It was suggested that FAO and the MoAL organize a meeting to bring together the certification agencies of the ECO countries

- Make efforts to develop regional cooperation in the seed sector at the level of the Ministries of Agriculture and Foreign Affairs, especially during the D-8 meeting.

Tajikistan

The Seed Policy Workshop was held 31 October 2014 in Dushanbe, Tajikistan. The main objective of the workshop was to review the status and define the constraints for development of the seed sector as well as discus the draft *Concept for the development of the seed sector in Tajikistan.*

More than 30 participants representing relevant stakeholders, including the Ministry of Agriculture (MoA), Tajik Agrarian University, the public and private sectors, and non-governmental organizations (NGOs), participated in the workshop. The seed policy document and the concept for the development of the seed sector were discussed and revisions suggested for final submission to the MoA, Tajikistan.

Pakistan

The National Seed Policy Workshop was held 13–14 November 2014 in Islamabad, Pakistan. The workshop was attended by 75 representatives from different departments of the Ministry of Food Security and Research, universities, and public and private sector seed companies. Discussion was held on different aspects of the national seed sector and some next steps were recommended.

The National Assembly Standing Committee on National Food Security and Research has cleared the long awaited 'The Seed (Amendment) Bill 2014. The Plant Breeders' Rights Bill has been submitted to Cabinet for approval.

Participants at the national seed policy workshops.Top left (Uzbekistan); top right (Turkey); bottom left (Tajikistan); bottom right (Pakistan)

Regional seed policy workshop

Within the framework of the regional project, FAO-SEC organized a regional seed policy workshop 5–9 January 2015 in Istanbul, Turkey. The objective of the regional workshop was to present and discuss the status of the national seed sectors and national seed policy documents of the various countries, develop a draft regional seed agreement, and develop a framework for a regional strategy for the seed sector in the ECO region. The regional seed agreement will provide ECO member countries with a framework for harmonizing variety registration and plant variety protection, seed quality control and certification, and phytosanitary measures to promote seed trade in the region.

Representatives from Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Uzbekistan, ECO, ECOSA, FAO, and ICARDA attended the meeting – 33 in total.

During the workshop, country presentations were made in which new developments in the national seed sector were highlighted. Moreover, key areas for harmonization were discussed, building on previous activities by FAO and ICARDA.

National seed fair

Following the regional workshop, participants attended the Seed Fair organized 8–9 January 2015 in Istanbul, Turkey, by the Turkish Seed Union and its subsidiary sub-unions.

The national seed fair was attended by more than 200 participants from 16 countries. These included ECO members – Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Iran, Pakistan, and Uzbekistan – as well as Germany, Netherlands, etc.

Participants at the regional seed policy workshop (left) and a partial view of the Turkish seed fair (right)

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Turkey organizes the Fifth Seed Congress

The Fifth Seed Congress, 20–22 October 2014, was organized in Diyarbakır, Turkey by the Faculty of Agriculture of Dicle University with valuable contributions from the public and private seed sectors.

The Congress covered various aspects of genetics, breeding, biotic and abiotic stress tolerance, seed science and technology, seed production systems, and delivery to farmers and the industry.

About 175 participants from Turkey and 38 international participants (from 16 countries) participated in the Congress. At the closing session, participants agreed to the Sixth Seed Congress being organized by Niğde University, Turkey.

NEWS AND VIEWS

News, views, and suggestions relating to the seed industry are included in this section, which is a forum for discussion between seed sector professionals.

International collaboration is the basis of plant breeding: open borders for private investments

Crop improvement requires both genetic resources and knowledge to provide farmers with better varieties. These two determining factors are in the hands of both public sector and private sector breeders. Politicians in some countries want to stimulate national plant breeding by severely limiting the degree of foreign investment in plant breeding, but this restricts the sharing of good varieties. Plant breeders know that such political views are not optimal for providing farmers with good varieties and seeds.

The beginning of crop improvement

For most of the history of agriculture, crop improvement and seed production were farmer-based activities carried out as an integral part of crop production and without any functional specialization. This was a slow process since it requires many generations of conscious and natural selection to lead to the modifications in the crop needed to adapt them to agricultural production systems. The Fertile Crescent was one of the most important regions in this early crop improvement. Globally important crops were domesticated in that region, starting some 10,000 years ago. However, the region also benefited from similar development (with other crops) in other parts of the world, such as rice in Asia, potato in the Andes region of South America, and sunflower in North America. To date there is no single country or region that is independent in terms of plant genetic resources. This is a main reason why the FAO promotes the conservation, use, and exchange of plant genetic resources to sustain crop improvement programs at national, regional, and global levels.

The purposeful crossing of different types of food crops some 200 years ago may be marked as the shift from farmer selection to conscious breeding. Innovations that followed were the basis for specialization in the science of plant breeding. This specialization included improvement of selection methods and the discovery of heredity in the late 19th century, the discovery of hybrid vigor in the early 20th century, and of DNA, and methods to use that knowledge effectively, in the second half of the 20th century. All these developments triggered collaboration among scientists and breeders. While breeding and seed production started in Europe in the private sector, it was the public sector in the USA that initiated plant breeding to trigger agricultural development. In both parts of the world, plant breeding consists of a mix of public and private sector investment. This mix of public and private sector involvement best serves the interest of farmers.

Public sector breeding

As private plant breeding did not take off in many other countries, enormous efforts were made from the 1950s onwards to initiate and coordinate public plant breeding. This 'Green Revolution' is still the basis for current plant breeding in the public sector for many food crops. National agricultural research institutes and universities benefit from the international agricultural research centers of the

CGIAR. These centers, in turn, have important collaboration with both universities and private sector plant breeders worldwide in order to stay on top of scientific developments. Breeders agree that, even though farmer selection remains relevant, especially in ecologically diverse regions, changes in agro-ecology through climate change and improved agricultural methods make local breeding, based on locally available landraces and knowledge only, too slow and insufficient. Scientific insights and the best germplasm are needed to respond to emerging challenges. Sometimes, foreign varieties do very well locally; often internationally available materials, such as those created by the CGIAR, need to be carefully selected and adapted to local conditions, and in some farming systems, the combination of knowledge and materials of both farmers and breeders in participatory plant breeding, provide the best results.

In all cases, the combination of local and internationally available knowledge and genetic resources gives the best results. In this way, plant breeding is a typical example of the proverb 'think global, act local'. The relative importance of local and global may be different for different crops and farming systems. In general, field crops have to be adapted to the local environmental factors, including, for example, soil, weather, and pests and diseases. In horticulture, however, the farmer largely adapts the growing conditions to the needs of the crop. For vegetable and flower production, it is easier to make investments to protect the crop from such adverse conditions as irrigation, improved substrates, protection against rain and sun, crop protection, etc. This means that internationally bred varieties may require less adaptation to local conditions, compared to field crops.

Emergence of the private sector

Globally, the private sector is gaining in importance in plant breeding. This is partly because of limitations in public spending and promotion of private sector investments, and to developments in the private sector itself. Entrepreneurship allows companies to look beyond their national borders. Technological and legal developments promise a better return on investment and demands by farmers for quality seed creates challenges for the public sector. The private sector comes in many different shapes, from local farmer cooperatives to large multinational companies. An important advantage of locally operating companies is that they provide an effective link between public research and the farmers. An advantage of the larger companies is that they can invest significantly in real innovation. A disadvantage of the larger companies is that they will invest only in crops the seeds of which can be commercialized well. This is especially true for hybrids, such as maize and cotton, and the high value seeds of vegetables. It is difficult to interest them in important self-pollinated crops like lentils and barley, or locally important crops like *tef* in Ethiopia. However, globally, the private sector is far ahead of the public one in breeding vegetable crops. It may also be difficult for the private sector breeders to develop varieties for poor farmers in ecologically very diverse areas that are found in remote mountainous areas. This means that the public sector will continue to have an important role to play in crop improvement, even when the breeding of some crops could be left to the private sector.

The politics

Plant breeding has drawn the attention of policy makers since the days of the Green Revolution. Now that private sector involvement is possible in many countries, they have embraced the value that such investments can bring for farmers and to the country. They also see that efficient seed companies can have good revenues, even when the seed price for farmers is reasonable. In some countries in Asia, the winds are changing. Indonesia, for example, demands that 51% of the ownership of seed companies should be in the hands of nationals. This means that foreign investors have to sell shares to citizens. Since breeding materials are the most valuable things for the breeder, and the 'crown jewels' of the company, such policies mean, in practice, that the mother company will be very reluctant to share its most valuable genetic resources with that country when they have only a minority share. This is particularly true for vegetable and maize breeding. The intention of such policies is to stimulate local investment in plant breeding, but the result may be negative for the farmers. Farmers in such countries will face a slower development of good varieties when foreign companies will not share their latest knowledge and genetic resources with the country.

Similarly, countries that follow policies to maximize on their national variety list the proportion of locally bred varieties, or varieties bred by locally owned or national public breeding institutes, are defying global developments. As a result, their farmers end up with

sub-optimal plant varieties. Such policies do not support national food security and rural development.

Also in the WANA region, there are countries where national policies are in place that discourage investments by foreign seed companies. It is laudable to support the emergence of a national seed industry, and foreign investors should be embraced as part of that effort to create a diverse and sustainable seed industry operated by both the public and private sectors.

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Evidenced-based seed system security work within the reach of all: automated data analysis programs

Agricultural researchers, NGOs, and policymakers are increasingly interested in the seed security of smallholder farmers, in order to develop better seed-related responses.

To answer the key seed security questions – Is seed available? Can farmers access seed? Does the seed have the quality that farmers want and need? – there needs to be solid, quantitative, evidence. For instance, there should be evidence on how smallholder farmers actually obtain seed from one season to another. However, few organizations on the ground gather such evidence. One reason for this is that organizations assume that gathering and analyzing seed security information require significant time and quantitative data analysis skills. However, this is no longer true! We are pleased to announce a new tool to help any organization gather and analyze seed security data quickly and easily – providing them robust results instantly.

This new automatic data analysis tool is freely available on the Seedsystem website (www.seedsystem.org). A household questionnaire (also available on the site) gathers concrete data on the seed sources farmers actually use, crop by crop and from one season to another. The analysis tool, custom-designed to work with the questionnaire, helps users enter data very quickly and easily, and minimizes any mistakes. Most importantly, the spreadsheet generates detailed results instantly (with embedded codes and formulae shaping the process). Therefore, basically, data is entered in Excel, and minutes later dozens of formatted tables emerge with clear, easy-to-read findings (Figures 1a and b).

What does this mean for a rigorous seed system security assessment? Organizations with even modest resources can gather and analyze precise seed security field data from hundreds of households, and have results in a matter of days (the time it takes for interviews and data entry). Field teams can see the results while still in the field and can use them to guide immediate response options – even for emergencies. And tables for reports are complete (before returning from the mission).

Hence, automatic data analysis allows for quick, but smart and evidenced-based findings – with a tool usable by non-specialists. The tools and the manuals for their use are available at www.seedsystem.org along with all the other tools and planning aids for conducting a seed system assessment. Let us expand our capacity for evidence-based seed system analysis across many regions of the globe.

Figure. 1. For automatic data analysis enter questionnaire data in a) and the results are generated immediately in b). Example drawn from the 2013 Seed Systems Security Assessment in Timor-Leste

a)

HHID	HHnam	age	gend	HH type	HH size	Resid	Area cult	Geo1	Geo2	Geo3	CrCuA	CrCuA1 Srce	CrCuA1 Ac	CrCuA1 Loc#	CrCuA1 LocU	CrCuA1 kg
1	Joaw da Costa	56	M	1	8	1	4	Aileu	Fahiri	Sidol	1	8	F	1	Plastik	5
2	Antonio Ramos	40	M	1	7	1	2	Aileu	Fahiri	Sidol	1	7	F	1	Plastik	5
3	Joao Mau Luan	51	M	1	9	1	1	Aileu	Fahiri	Sidol	1	4	D	10	Lata	2.5
4	Jose Ribeiro	38	M	1	6	1	2	Aileu	Fahiri	Sidol	1	1	A	1	Lata	4.5
5	Luis Mesquita	30	M	1	6	1	2	Aileu	Fahiri	Sidol	5	1	A	6	Futun	600
6	Carlos da Silva	45	M	1	10	1	2	Aileu	Fahiri	Fahir	1	4	D			5
7	Paulo de Arauj	70	M	1	5	1	2	Aileu	Fahiri	Sidol	4	3	D	1	Kaleng	15
8	Marcelino de A	36	M	1	7	1	2	Aileu	Fahiri	Sidol	1	1	A	4	Lafatik	20
9	Lourenco Perei	50	M	1	9	1	2	Aileu	Fahiri	Fahir	1	1	A	1	Lata bot	13
10	Silvino Mendes	30	M	1	6	1	1	Aileu	Fahiri	Sidol	4	7	F	1	Plastik	5
11	Amelia Jose de	43	F	1	9	1	1	Aileu	Fahiri	Sidol	1	1	A	0.5	Kaleng	0.36
12	Alberto Lateus	39	M	1	7	1	1	Aileu	Fahiri	Sidol	1	7	F	1	Plastik	4

b)

Seed planted by source in current season

2) Proportion (%) of seed supplied by source for each crop.

Crop	Total kg sowed	% of total							
		Home saved /own stock	friends, neighbours, relatives	local market	agro-input dealer	community-based seed groups	government	NGO / FAO	Other
Maize	2395.6	**69.5**	5.2	15.2	0.0	0.1	6.1	3.9	0.0
Common beans	1800.5	**71.9**	10.0	15.4	0.0	0.0	0.0	0.0	2.8
Cassava	165.8	**92.0**	6.0	0.0	0.3	0.0	1.3	0.4	0.0
Sweet potato	37.2	**86.1**	10.1	0.4	0.0	0.0	3.2	0.2	0.0
Taro	30.5	**99.8**	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Irish Potato	266.0	26.7	7.5	28.2	0.0	0.0	**37.6**	0.0	0.0
Peanut	57.6	**45.3**	4.3	**50.3**	0.0	0.0	0.0	0.0	0.0
Rice	2506.0	**76.3**	7.5	6.1	0.0	0.6	8.1	1.4	0.0
TOTAL-all crops	7387.2	**71.8**	7.2	12.3	0.0	0.2	6.1	1.8	0.7

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Briefs for vegetable seed relief programs

Vegetable growing can provide nutrition and income for those recovering from crisis – but the gains are not automatic. What should be considered in designing vegetable seed-oriented relief programs? What seed species, characteristics, and sources are most appropriate? A set of two new practice briefs addresses these questions, gives examples from the field, and highlights key resources for practitioners.

These writings join the set of tools, advice, and research resources found at SeedSystem.org, a site developed to provide practical, hands-on guidance to help professionals design seed-related assistance. The vegetable seed briefs build on an existing series of 10 Seed Aid for Seed Security practice briefs, and are found here:

- *Brief 11. When and how to respond with vegetable seed programming* (http://seedsystem.org/wp-content/uploads/2014/07/seedbrief11-.pdf)

- *Brief 12. Vegetable seed supply and selection in humanitarian response* http://seedsystem.org/wp-content/uploads/2014/07/seedbrief12.pdf

Louise Sperling, Catholic Relief Services, Baltimore, USA; email: l.sperling@cgir.org,

More attention sought for vegetable seed sector in Central Asia and Caucasus

The population of Central Asia and the Caucasus (CAC) continues to grow; and so does the demand for healthy and nutritious food. The countries are increasing both the quantity and variety of their staple crops, particularly vegetables – around 40 indigenous and introduced, non-traditional species are currently cultivated in the region. According to FAOSTAT, the CAC produced some 20 million tonne of vegetables on 800,000 ha in 2012. Growing vegetables is an important livelihood for many farmers and rural households. Moreover, agricultural produce is a major export in some countries like Uzbekistan, where food exports, specifically fruits and vegetables, are worth about USD5 billion a year.

While national governments are paying more attention to the fruit and vegetable processing industry, there are still some difficulties to increasing production. First, farmers need vegetable varieties adapted to local conditions. National agricultural research institutions should work closely with international research organizations. In 2006, the World Vegetable Center established strong research partnerships, like the Central Asia and the Caucasus Regional Network for Vegetable Systems Research and Development (CACVEG). The network fosters cooperation in the region through joint research trials and seed production to ensure adoption of new varieties. It meets every year to review progress. The State Variety Testing Commissions released and registered 42 new varieties of eight vegetable crops, including tomato, sweet and hot pepper, eggplant, vegetable soybean, mung bean, yard-long bean, and cabbage, between 2007 and 2014.

Second, seed production systems need improvement to keep pace with research. Adoption rates are slow as there are not sufficient domestic vegetable seed producers and suppliers. Most national vegetable seed sectors are fragmented and limited and local growers have to rely on imports, which are often more expensive and not adapted to local conditions, presenting higher financial risks to farmers.

During the Seventh CACVEG Steering Committee meeting, held 21–23 October 2014 in Tashkent, Uzbekistan, a shortage of vegetable seed production farms was highlighted. For example, about six state enterprises produce vegetable seed in Azerbaijan, but these meets only 20–30% of the total need of 450–700 tonne of seed a year. In Kazakhstan five seed production farms produce, about 30% of vegetable seed for their own use (3%) or for sale to smallholder farmers (around 27%). In some cases, imported seed is 10–12 times more expensive than locally produced seed. In Armenia and Georgia, most of the seed is imported. In Armenia, imported vegetable seed constitutes around 95%, although the demand is around 25–30 tonne.

There are a few reasons for this. The first is the lack of finance. The sector needs more funding as seed production farms find it hard to make a profit. Second, seed producers often do not have the necessary skills and knowledge. For example, not many know about integrated pest management, an ecosystem-based approach to growing healthy crops and minimizing the use of pesticides, which cuts costs and increases profits. Third, more government incentives would give the sector a much-needed boost. Making it easier for seed producers to get licenses would be one way to help.

Currently renewed efforts are under way to restore national seed production systems and international research organizations are helping too. For example, under the CGIAR research program Dryland Systems, launched in 2013, ICARDA, International Potato Center, World Vegetable Center, Bioversity International, and International Center for Biosaline Agriculture are collaborating to establish a seed system platform in the region to supply farmers with high-quality seed and planting materials. The CACVEG network has also advocated plans to set up a national vegetable seed center in Uzbekistan. The hope is that more such centers will open in the region. With sufficient funding, however, this could happen sooner rather than later. All this would contribute to increasing high-quality vegetable production in the region. This is, however, more likely to happen, if the whole chain works well. As scientists point out, there are many good varieties of vegetables. They only need

to be mass produced and delivered to farmers. For that, better seed systems are needed.

Mung bean seed production in Fergana, Uzbekistan

Source: CAC E-Newsletter, October 2014

Breakthrough in understanding wheat virus epidemics improves control options

Critical new understanding of the disease cycle of a wheat virus will help farmers around the world protect their wheat crops from a devastating disease and major yield losses.
A PhD candidate with the University of Western Australia's School of Plant Biology and Institute of Agriculture has identified that wheat seed is critical for the dissemination of wheat streak mosaic virus (WSMV), and its persistence between successive growing seasons.

For more than 60 years, researchers on WSMV in the Great Plains region of North America thought they understood its disease cycle. They knew of its carry-over between crops in infected grasses and volunteer wheat plants and its transmission from infected to healthy plants by its wheat curl mite vector.

Virus researchers in Western Australia realized that this explanation did not account for the rapid distribution of the virus around Australia since it was first detection in 2002. Nor did it explain the widespread occurrence after summer drought conditions in the Mediterranean climate of the Western Australia wheat belt. For the first time in the world, it was found that WSMV was seed borne in wheat. This explained its introduction into Australia and other continents and its rapid distribution to new locations – through sowing WSMV-contaminated wheat seed lots. During her PhD candidature, Ms Coutts undertook an in-depth study to uncover the role of wheat seed in the disease cycle of the virus. This has resulted in a critical new understanding with worldwide relevance. It was found that WSMV is carried over between growing seasons in two ways. First through infected wheat seed left behind after harvest. This germinates to produce infected volunteer wheat plants. Second, through the inadvertent sowing of infected wheat seed stocks by farmers. Wheat curl mite then spreads the virus further from these infection points. No such seed transmission occurs in other cereals or grasses.

Seed transmission in wheat is particularly important in a Mediterranean-type environment as the hot dry summer conditions eliminate any volunteer cereal or annual grass hosts. But, after rains in late summer or early autumn, new WSMV infection sources develop through germination of discarded infected wheat seed. The epidemic develops from these, or from sowing the crop itself using infected seed. Perennial grasses are non-hosts.

It is recommended to remove all potential WSMV and wheat curl mite hosts (grasses and volunteer cereals) prior to crop sowing. This will ensure there is no virus inoculum for the spread of the disease to the new wheat crop and populations of its mite vector are minimized. Wheat seed should be tested before sowing to ensure it is healthy and no wheat seed should be left in the field after the harvesting of infected crops. To achieve this, harvesters can be adapted to collect small-sized seeds that are excluded from the main seed harvest. This is done already with weed seed. She also recommends late sowing when temperatures are low and, therefore, not conducive to wheat curl mite population build up or movement, and to plant WSMV-resistant wheat cultivars if available.

The paper, *Epidemiology of wheat streak mosaic virus in wheat in a Mediterranean-type environment* was recently published in the *European Journal of Plant Pathology*. The Grains Research and Development Corporation provided financial support. The PhD research was undertaken in laboratory, glasshouse, and research station facilities of the Department of Agriculture and Food, Western Australia.

For more information contact the UWA Institute of Agriculture Team (M082) The University of Western Australia, 35 Stirling Highway, Crawley WA 6009; email: ioa@uwa.edu.au; Web: www.ioa.uwa.edu.au

Source: The UWA Institute of Agriculture

News from UPOV

Appointment of Secretary-General

At its 48th ordinary session, held in Geneva 16 October 2014, the Council of the International Union for the Protection of New Varieties of Plants (UPOV) re-appointed Mr. Francis Gurry as the Secretary-General of UPOV for the period 16 October 2014 to 30 September 2020.

Developments on the Plant Breeders' Rights Act for Zanzibar

The UPOV Council at its 48th ordinary session noted that the Plant Breeders' Rights Act of Zanzibar, incorporated the changes in the decision of the Council of 22 March 2013, and agreed that the additional changes did not concern the substantive provisions of the 1991 Act of the UPOV Convention. The legislation governing breeders' rights now covers the whole territory of the United Republic of Tanzania and the country can become a UPOV member.

Observer status

UPOV has granted observer status in the Council and the Administrative and Legal Committee (CAJ) to the South Centre, and to the World Farmers' Organization in the Council, the CAJ, and the Technical Committee.

UPOV publication

The proceedings of the UPOV seminar *'Plant variety protection and technology transfer: the benefits of public-private partnership*', the symposium '*Plant breeding for the future*', and the symposium '*The benefits of plant variety protection for farmers and growers*', including the Executive summary, have been published in French and Spanish seehttp://www.upov.int/about/fr/benefits_upov_system.html).

Election of new Chairpersons of UPOV bodies

The UPOV Council elected, in each case for a term of three years ending with the 51st ordinary session of the Council, in 2017:

1. Mr. Tanvir Hossain (Australia), Chairman, Technical Working Party for Agricultural Crops
2. Mr. Adrian Roberts (United Kingdom), Chairman, Technical Working Party on Automation and Computer Programs
3. Mr. Katsumi Yamaguchi (Japan), Chairman, Technical Working Party for Fruit Crops
4. Mr. Kenji Numaguchi (Japan), Chairman, Technical Working Party for Ornamental Plants and Forest Trees
5. Ms. Swenja Tams (Germany), Chairperson, Technical Working Party for Vegetables
6. Mr. Kees van Ettekoven (Netherlands), Chairman, Working Group on Biochemical and Molecular Techniques and DNA-Profiling in Particular).

Plant variety protection statistics

Fifty-eight members of the Union now offer protection to all plant genera and species (up from 56 in 2013), with 14 members of the Union offering protection to a limited number of plant genera and species. Of those 14, three countries (Brazil, China, and South Africa) extended protection to additional plant genera and species in 2014. In 2013, the number of titles in force exceeded 100,000 for the first time. The approximately 103,261 titles in force in 2013 represented a 3.8% increase on the numbers for 2012 (99,501).

In 2013, there was a 6.3% increase in the number of applications for plant variety protection (14,788 in 2013 vs.13,908 in 2012). This represents, an 8.7% increase in the number of applications by residents – 9,502 in 2013 vs. 8,739 in 2012 – and a 2.3% increase in the number of applications by non-residents – 5,286 in 2013 vs. 5,169 in 2012. The number of titles granted increased from 9,822 in 2012 to 10,052 in 2013 (a 2.3% increase).

Cooperation in the examination of new plant varieties

In 2014, the number of plant genera and species for which there were agreements between members of the Union for cooperation in the examination of distinctness, uniformity, and stability totaled 2005, compared to 1997 in 2013.

Adoption of documents

The UPOV Council adopted the following documents:

- List of Test Guidelines Adopted by UPOV (Revision) (document TGP/2/2)
- Experience and Cooperation in Distinctness, Uniformity and Stability Testing: Section 10/3: Notification of Additional Characteristics and States of Expression (Revision) (document TGP/5

- Development of Test Guidelines (Revision) (document TGP/7/4)
- Trial Design and Techniques Used in the Examination of Distinctness, Uniformity and Stability (Revision) (document TGP/8/2)
- Glossary of Terms Used in UPOV Documents (correction of Spanish version) (document TGP/14/2)
- List of TGP documents and latest issue dates (Revision) (document TGP/0/7)
- Exchangeable Software (Revision) (document UPOV/INF/16/4)
- Software and Equipment Used by Members of the Union (document UPOV/INF/22/1)
- List of UPOV/INF-EXN Documents and Latest Issue Dates (document UPOV/INF-EXN/6)

All adopted documents will be included in the UPOV Collection (see http://www.upov.int/upov_collection/en/)

For more information about UPOV, please contact the UPOV Secretariat: Tel: +41-22-3389155; Fax: +41-22-7330336; email: upov.mail@upov.int; Website: www.upov.int

News from the International Seed Federation (ISF)

There are two relatively recent publications on the ISF website. The first concerns the use of molecular techniques in seed health tests or so-called *indirect seed health tests* (http://www.worldseed.org/isf/on_specific_technical_subjects.html) and the other addresses so-called *pest lists* (see http://www.worldseed.org/isf/pest_lists.html). The websites will provide information on the view of the seed industry on the seed health issues and the associated pest risks. The seed business today uses many recognized risk reduction and prevention measures for seed pests of concern, such as seed certification schemes, resistant varieties, seed testing and seed treatments.

CONTRIBUTIONS FROM SEED PROGRAMS

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

Durum wheat value chain in Ethiopia: fighting rusts and linking farmers with markets

Of the seven wheat species grown, bread wheat and durum wheat are the dominant ones in Ethiopia. The area of wheat production increased from 769,000 ha in 1995 to 1.63 million ha in 2012/13. Both small-scale farmers and large-scale state farms grow wheat exclusively under rainfed conditions.

Earlier reports indicated that, in the 1980s, durum wheat landraces occupied 60% of the area grown under wheat with the remaining 40% covered by introduced bread wheat varieties. However, over time, these figures have changed radically; and the durum wheat area was replaced rapidly with improved bread wheat varieties in the major wheat production regions. To date, it is difficult to get precise estimates of bread and durum wheat production as statistical abstracts put the two species together, and farmers largely fail to distinguish the difference between the two species in terms of their use. From the results of field surveys, the massive replacement of durum wheat landraces by modern bread wheat varieties is evident across the country. There is a combination of factors explaining this decline in area. These include low productivity, low grain prices, and problems in marketing durum wheat.

However, the expansion of the bread wheat area is not without its challenges, particularly from rusts. The emergence of stem rust (Ug99) and its variants, including the Digalu race in Ethiopia, and epidemics of yellow rust are some of the recent threats to bread wheat production in the country. In 2010, an estimated 581,000 ha of bread wheat area was affected in 289 districts across the country with substantial yield losses reaching up to 80% in severely affected areas. Similarly, the stem rust outbreak in 2013 affected close to 100,000 ha in 17 districts in the Bale Zone and some parts in the Arsi Zone of Ethiopia. It is important to diversify the portfolio of wheat varieties available to farmers to avoid vulnerability to periodic epidemics of rust diseases. Durum wheat appeared to be less affected by stem rust and yellow rust compared to bread wheat, which is highly vulnerable to both diseases.

Since 2011, ICARDA, in partnership with EIAR, has been implementing a project on '*Rapid deployment of rust resistant wheat varieties for achieving food security in Ethiopia*', which is funded by USAID. Cognizant of

this vulnerability factor, the project sought to revive durum wheat production in some potential areas with the following objectives:

- To tackle the widespread bread wheat rust problems which posed significant economic threats
- To create a better platform for the producer-consumer linakge with agro-industry
- To provide reliable marketing options for the wheat producers and the wheat sector.

On 17 June 2014, EIAR organized a workshop on the durum wheat value chain, bringing together all the relevant value chain actors in Ethiopia. The 80 participants attending the workshop were drawn from MoA (Extension Directorate), region, zone, and district Bureaus of Agriculture – East Shewa, West Arsi and Arsi Zones – Oromia Cooperative Bank; Oromia Cooperative Agency, farmers' cooperatives and unions, federal (EIAR) and regional (OARI) agricultural research institutes; and flour, pasta, and macaroni factories.

Eight pilot districts from East Shewa (Ada'a, Ziquala, and Lume), Arsi (Limu-Bilbilu and Hitosa), and West Arsi (Gedeb Asasa, Dodola, and Arsi Negele) Zones were identified for initiating both durum wheat seed and grain production. The project provided seed and engaged the farmers' primary cooperatives to become durum wheat seed and grain producers and to market them through the unions. Two durum wheat varieties Ude (from CIMMYT germplasm) and Mangudo (recently released from ICARDA germpalsm) were included in the program. Members of the primary cooperatives were identified, organized, and trained as durum wheat seed producers and grain producers.

About 20 tonne of seed was distributed for seed production to 206 farmers (18 female farmers, 9%) and planted on 170 ha. An estimated 547 tonne will be produced and dsitributed to durum wheat grain producers next year. The amount is sufficient to plant 3648 ha and produce at least 11,000 tonne of durum wheat grain. The seed produced by farmers will be collected and marketed collectively or through unions to the their members for durum wheat grain production. The seed prodcuers will continue to enegage and sepecialize in seed production in the coming years.

Another 52 tonne of seed was distributed to 1716 farmers (85 female farmers, 5%) and planted on 571 ha for durum wheat grain production. An estimated 1712 tonne of durum wheat grain will be produced this season, to meet the requirements of the agro-industry. The grain production will be aggregated and sold through farmer's unions to flour factories based on contractual agreements. The grain will be aggregated (minimum of 40 tonne), sampled, and tested for protein quality, gluten content, moisture content, and hectoliter weight to determine a price based on quality. The contractual agreement between the unions and factories will be signed and the samples will be collected and tested following harvesting.

Visit to seed (top left) and grain (top right) production fields, and group disucssion after the field day (bottom)

On 8 November 2014. a field day with all stakeholders was organized in East Shoa zone to review the progress in implementation. Field visits were made to the seed and grain production fields to see the performance of the varieties and crop condtions. During the follow-up discussion, all stakeholders appreciated the performance and have agreed to go forward with implmentation of the initiative through contractual agreements to be signed between the unions and the factories. The Ethiopian Millers Association and the factories promised to take steps to encourage and support domestic production. It is envisaged to expand the activities in the coming years, including more farmers' cooperatives and unions across the country.

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Strengthening the wheat seed sector in Iraq

Agriculture is an important sector in the economy of Iraq. Currently it supports the 7 million rural population, providing 20% of the employment and about 8% of gross domestic product. However, the agricultural sector has declined continuously since the 1980s. The productivity of cereal crops, such as wheat, barley, maize, and rice, has fallen significantly and more than half of the country's total food requirement is imported. Today, a constrained policy environment and the ineffective transfer of new technologies to farmers has limited the productivity of the agricultural sector. Farmers and agribusinesses lack a competitive edge and are unable to take full advantage of market opportunities.

ICARDA has implemented a project on *Harmonized support for agriculture development* (HSAD – meaning *harvest* in Arabic) funded by USAID from 2013 to 2014. The objective of the project are to strengthen the agricultural value chains in Iraq, develop enabling policies, regulations, and institutions, improve delivery of proven technologies, and build the capacity of NARS partners and the beneficiaries. The HSAD project considers increasing the availability of quality seed one of the major technical interventions that can strengthen the wheat seed sector. This can be achieved by:

- Supporting sustainable wheat production through enhanced availability of quality seed
- Popularizing and demonstrating wheat varieties and the associated technologies
- Assessing the seed processing capacity of seed companies and farm machinery for NARS
- Strengthening the capacity of the human resources in the seed sector
- Providing technical support in formulating and aligning seed regulations to national seed policy and seed law
- Developing wheat varieties with resistance to biotic and abiotic stresses.

Accelerated seed multiplication to enhance availability of quality wheat seed

One objective was to ensure the fast replacement of existing commercial varieties with new high yielding varieties with tolerance to abiotic and biotic stresses. This would mean minimizing the time between identification of potential varieties and their availability for use in farmers' fields. The accelerated seed multiplication under the project included pre-release seed multiplication of elite promising lines, post-release breeder and foundation seed multiplication of newly released varieties, and registered and certified seed multiplication of existing commercial varieties. The project provided extensive technical support to ensure the quality of seed produced by the NARS, seed companies, and farmer seed growers. During the project, the availability of quality seed was increased and about 17,400 tonne of different seed classes produced and made available to ensure sustainable wheat production (Table 1).

Table 1. Amounts of the different seed classes produced during the 2013 and 2014 crop seasons

Seed class	Seed production (tonne)		
	2012/13	2013/14	Total
Pre-release	1.5	3.97	5.47
Breeder	224	330	554
Foundation	1,976	2,985	4,961
Registered	3,381	7,042	10,423
Certified	323	1,136	1,459
Total	**5,905**	**11,497**	**17,402**

Pre-release seed multiplication of promising lines (left) and post-release foundation seed production (right)

ICARDA and its NARS partners also identified Adana 99 from Turkey as a suitable variety for the Iraqi Kurdistan Region (IKR) and the project procured 40 tonne of source seed to gear up certified seed production to ensure the availability of high-quality seed to farmers. Forty farmers planted about 300 ha with an estimated production of 1000 tonne of seed for further distribution next season.

In addition, the technical support was extended to the informal sector to upgrade the quality of seed saved by farmers. In the IKR region, around 3147 tonne of seed was processed for 315 farmers using

the mobile seed cleaners. This seed was for planting in 2013/14.

Popularizing newly released wheat varieties

Newly released crop varieties are not promoted either by NARS or by seed companies. Often, there is an insufficient amount of seed for multiplication, let alone the promotion of a variety by extension services. The integration of fast-track variety release, variety popularization, and accelerated seed multiplication should go hand in hand. Variety popularization not only creates varietal awareness, but also creates a demand for quality seed of the new varieties. Several field demonstrations were conducted, including a participatory seed production session for farmers. These generated a lot of interest among the farmers as was evidenced by the long discussion sessions between farmers, NARS staff, and HSAD/ICARDA seed experts.

Demonstration field of Bohouth 22 and a field day at Suweria, Wasit Province in 2013/14

Strengthening the infrastructure of national partners

The project

- Uundertook the assessment of NARS' facilities, seed companies, and certification agencies and provided recommendations and critical equipment
- Conducted an assessment of seed cleaning and treatment facilities of major seed companies and recommended corrective measures for increasing the efficiency of the processing plants. Training courses in seed processing were conducted
- Assessed a seed testing laboratory of the Ministry of Agriculture and Water Resources (MoAWR) and purchased equipment (seed divider, purity analysis board, weighing balance, germinators, oven, etc.) to strengthen capacity
- Assessed and purchased facilities for the agricultural research stations to strengthen breeder seed production at the State Bureau of Agricultural Research and MoAWR. Four plot seeders were purchased and provided to the NARS.

Assessing the seed processing plants in various provinces of Iraq

Strengthening human resources capacity of stakeholders

HSAD also conducted several in-country training courses in plant breeding, seed production, seed processing, and seed quality to upgrade the knowledge of the staff of MoA and MoAWR (Table 3). The training programs were conducted in six different provinces of Iraq, including the IKR, so that the local staff of the different provinces directly benefited from these capacity-building programs.

Participants of training courses organized by HSAD

The project also made concerted efforts to interact closely with all the NARS partners encouraging their continuous interaction with and support to the national staff to ensure the sustainability of the seed activities even after the conclusion of the project.

To support human resources' capacity development, two manuals, one on wheat seed production and quality control and the another on seed processing, have been prepared and published in English and Arabic.

Table 3. In-country short-term training courses conducted under the HSAD project

Course	Location	2013	2014	Total
Wheat seed production and management	Al-Najaf	45		45
Operational management of mobile processing units	Erbil, Sulaimaniya and Dohuk	68		68
Plant breeding	Erbil	29		29
Principles and practices of seed processing	Wasit and Diwaniya		76	76
Concepts of seed quality	Sulaimaniya and Dohuk		60	60
Principles and practices of seed production, processing and quality testing	Erbil		38	38
Total		**142 (10)**	**174 (33)**	**316 (43)**

Note: Figures in bracket are the numbers of female participants

Support for formulating regulations to implement national seed policy and Seed Law

The project consultants had several rounds of meetings with the MoA staff in which different components of the seed regulations discussed. Technical support was provided outlining the broader objectives and the formulation of seed regulations was finalized.

A separate study was conducted on wheat policy in general and the seed sector in particular, to provide policy action by the government.

Evaluation of wheat nurseries introduced from ICARDA

In order to increase the availability of high yielding wheat varieties possessing resistance to different abiotic and biotic stresses, ICARDA made available two sets of seeds of bread and durum genotypes for testing and evaluation under different locations in Iraq, including IKR. About 270 genotypes were planted and ICARDA experts provided continuous support in evaluating and identifying suitable genotypes adapted to the agro-ecological conditions of Iraq (Table 4).

Table 4: Wheat variety evaluation trials conducted under HSAD

Nurseries	Locations	No. of lines evaluated
Elite spring bread wheat trial	Baghdad and Erbil	24
Dryland spring bread wheat trial	Nineveh and Erbil	24
International durum observation nursery-Mediterranean dryland	Nineveh and Erbil	144
Irrigated spring bread wheat trial	Baghdad and Sulaimaniya	24
International durum yield trial - Mediterranean dryland	Nineveh and Sulaimaniya	24
International barley yield trial – high input conditions	Baghdad and Sulaimaniya	25

Evaluation of wheat nurseries introduced from ICARDA

A synthesis of HSAD achievements is available in *Iraq harvest: agricultural innovation for Iraq's smallholder farmers. A review of progress and achievements of the HSAD-Iraq program* (https://apps.icarda.org/wsInternet/wsInternet.asmx/DownloadFileToLocal?filePath=Research_to_Action/HSAD%20Magazine.pdf&fileName=HSAD%20Magazine.pdf)

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Iran releases a new facultative barley variety for cold dryland areas

Ansar is a new facultative barley cultivar developed from ICARDA germplam (IWPBYT 1994-1995 (Yea 168.4/Yea 605.5//Yea206-4A-3) released for commercial cultivation in the cold dryland areas of Iran. Evaluation of the new cultivar under rainfed condition in Maragheh, Qamloo, Zanjan, Sararood, Ardebil, Shirvan, and Orumieh research stations (1994–2013) showed that, *Ansar* had high grain yield potential under dryland conditions. The mean grain yield for Ansar was 2724 kg ha^{-1}, for Abidar, 2335 kg ha^{-1}, and Sahand, 2643 kg ha^{-1}. Results revealed that Ansar is more tolerant to cold and drought stresses and resistant to lodging and shattering, thus it is suitable for the cold drylands areas of Iran. It had the highest 1000 kernel weight.

It is a facultative growth habit genotype with early maturity, 73 cm plant height, 46 g 1000 kernel weight, white grain color, and stable grain yield. Based on these results, the new line was released in 2014 under the name of Ansar for the cold dryland areas of Iran.

Ansar, a new facultative barley variety released for the cold dryland conditios in Iran

Agronomic characteristics and average grain yield of the barley variety Ansar

Traits	Ansar	Abidar (Check)	Sahand (Check)
Grain yield (kg ha^{-1})	2,724	2,335	2,643
Plant height (cm)	73	69	67
100 grain weight (g)	46	44	43
Days to heading	175	176	176
Lodging	R	R	R

Uzbekistan opens a new center for Seed Production

Uzbekistan has established a new National Center for the Seed Production of Grain Crops. The center will operate under the Ministry of Agriculture and Water Resources. The workshop, *'The Most Important Reserves for Implementing the Food Program in Uzbekistan'*, which was held in Tashkent, Uzbekistan, June 2014, reflects the growing attention in the country to agricultural research and development. It is a logical continuation of efforts to increase grain production and a major step towards ensuring food security in the country. Some scientists believe this is an important development for a number of reasons.

First, it will improve farmers' access to quality seed. Given that seed is the most important input, its quality and availability have a major impact on grain production. It is estimated that quality seeds of improved varieties can increase yields by as much as 20–25%. In particular, there is a need for increased production of the seed of improved wheat varieties that are tolerant of diseases like yellow rust, or of very high and low temperatures. For example, Central Asia has seen six outbreaks of yellow rust since 1999, with the most recent one in 2014. As controlling the disease with fungicides is costly, growing yellow rust resistant varieties is more efficient.

In recent years, several yellow rust-resistant winter wheat varieties have been identified by research institutions in Uzbekistan in collaboration with ICARDA, CIMMYT, and International Winter Wheat Improvement Program. They include varieties like *Bunyodkor, Gozgon,* and *Yaksart,* which also yield more than local wheat varieties – up to 10 t/ha.

The National Center for Seed Production of Grain Crops will facilitate adoption of wheat varieties like Bunyodkor

Second, the center will serve as the main link between national and international research institutions and local farmers. Together with their counterparts from international research organizations, national researchers have developed a number of high-quality wheat varieties. As one of the functions of the center is to facilitate adoption of promising varieties, it will be an effective mechanism for mainstreaming research results.
This is yet another milestone in wheat improvement efforts in Uzbekistan. It will surely contribute to resolving challenges in the agricultural sector, in particular those in the seed supply systems.

Source: CAC E-Newsletter, October 2014

RESEARCH NOTES

This section contains short communications on practical research or relevant information on agriculture or seed science and technology.

Farmers' knowledge and use of malt barley varieties and perceptions of seed quality in southeastern Ethiopia

Karta K. Kalsa[1], Astawus Esatu[1] and Abebe Atilaw[2]

Abstract
Farmers in Arsi and West Arsi Zones were surveyed to understand theirs knowledge and use of malt barley varieties, seed availability, and perceptions of seed quality. In four potential malt barley-producing districts (Kofele, Kore Lemu Bilbillo, and Shashemene), 113 household heads from eight peasant associations were interviewed. The results indicated that the popular malt barley varieties known by farmers are Beka, Miscal-21, Holker, and Sabini. The majority of farmers in West Arsi use Miscal-21 while those in Arsi Zone use Holker. Almost 94% of respondents, covering about 87% of the malt barley area used certified seed from formal sources. Farmers believed that certified seed from the formal sector has a better yield than seed sourced from the informal sector. Many farmers believe that field emergence and freedom from admixtures are important criteria for quality seed at the farm level. Farmers use very few improved barley varieties, although newly released varieties with acceptable malting quality are available. Access to the preferred barley varieties is a constraint because of the shortage of seed. A concerted effort is required to promote new varieties and supply seed to sustain malt barley production in these potential areas of southeastern Ethiopia.

Introduction
Ethiopia is the largest producer of barley in sub-Saharan Africa. There is great potential for malt barley production, mainly in the southeastern, central, and northern highlands of the country. In recent years, the demand for malt barley has increased, triggering increased national production. The increased demand can be met only through increased production and productivity and through improved technologies, including supplies of quality seed of new varieties (Lakew et al. 2012). In 2013/14, only 3.5% of the barley area of 1019 million ha in the country was covered with seed from the formal sector (CSA 2014). The remaining area was covered with seed from informal sources, such as farm-saved seed, local exchange or purchased from local markets.

There are some underlying critical issues concerning the quality of malt barley grain supplied to the malt factories. While crop management can make a substantial contribution, the farmers' seed sources and their awareness of seed management techniques play important roles in supplying quality malt barley to factories. The objective of this study was to understand the farmers' knowledge and use of malt barley varieties, seed availability, and perception of seed quality in the Arsi and West Arsi highlands of southeastern Ethiopia.

Methodology
One district in Arsi and three districts in West Arsi were selected based on their potential for malt barley production and supply. Eight peasant associations were selected – four from Lemu Bilibilo (Arsi) and four from Kofele, Kore and Shashemene districts (West Arsi). In each peasant association, three barley growing development groups (a development group consists of about 30 heads of household who live in one village) were selected. Three to five farmers from each development group were chosen at random and interviewed. Thus, 113 household heads were interviewed from the eight peasant associations.

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A mean comparison and descriptive analysis of the results were carried out using SPSS software to determine the farmers' knowledge of malt barley varieties and their use, seed source, seed availability, and the farmers' perceptions of seed quality.

Results and discussion

Knowledge and use of malt barley varieties

The survey results indicated that most farmers knew such malt barley varieties as Miscal-21 (78.8%), Holker (58.4%), and Sabini (52.2%). About 63% of respondents planted Miscal-21 and 56% planted Holker (Table 1). High yield and market demand are the major reasons for the extensive use of some malt barley varieties by farmers (Begna et al. 2014). Though a reasonable proportion of the respondents knew of the variety Beka, only 8% of them have used it during the last five years, suggesting that farmers no longer find it acceptable. Bahati and Bekoji-1, new malt barley varieties, were less common in the area and more promotional work is required to increase varietal choice. These new varieties may gradually replace or complement older ones through the ongoing pre-extension demonstrations and popularizations, provided continued seed availability is assured.

Table 1. Farmers' knowledge and use of malt barley varieties (n = 113)

Variety	Variety knowledge		Variety use	
	Frequency	Proportion (%)	Frequency*	Percent (%)
Holker	66	**58.4**	63	55.8
Beka	45	39.8	9	8
Sabini	59	**52.2**	34	30.1
Miscical21	89	**78.8**	71	62.8
Bahati	27	23.9	19	16.8
Bekoji-1	11	9.7		

*Varieties with response frequencies of less than five have been dropped

Malt barley was grown on about 39% of the cultivated area in the districts studied. The majority (91%; n = 112) of farmers in the districts have almost covered their malt barley areas (87.6%) with certified seed from formal sources (Table 2), but with some variations in use among the districts. In Lemu Bilbilo district, about 90% of the malt barley area was covered with seed from formal sources. Almost all respondents (93.4 %; n = 61) who produced malt barley in that district used a certain amount of certified seed from formal sources. In contrast, about 88% (n = 16) of respondents from Shashemene district covered 73% of their malt barley area with certified seed from formal sources.

Table 2. Area (ha) covered with malt barley and certified seed in the 2013/14 crop season

Districts	No of farmers	No of barley growers	Total cultivated area (ha)	Malt barley area (ha)		
				Total	Covered by CS	Proportion (%) covered by CS
Limu-Bilbilo	61*	57	190.5	65.5	59	90.1
Kofelle	28	24	35.1	18.7	15.48	82.8
Shasha mene	16	14	17.5	10.3	7.5	72.8
Qore	7	7	14.8	6.5	6.5	100.0
Total	**112**	**102**	**257.9**	**101**	**88.48**	**87.6**

Note: CS = certified seed

Seed is an important agricultural input that carries new crop technologies from research plots to farmers' fields and results in increased agricultural production and productivity. Small-scale farmers obtain seed for planting from both the formal and informal sectors. In Ethiopia the latter predominates. Seed from formal sources is certified for important quality attributes, such as varietal and analytical purity, germination, and health.

Farmers believe that there is a yield increase when using certified seed from formal sources. Use of certified seed has increased the average yield of malt barley from 1783 to 2027kg ha^{-1} – a 13% yield advantage over the use of seed from local sources (data not presented). The farmers' estimated average yield increase from using certified seed compared to using seed from local sources was about 579 kg ha^{-1} (SD = 391) (Table 3).

Table 3. Farmers' perceptions of then yield increase obtained from use of certified seed

District	No. of farmers	Average increase in yield (kg)	SD
Lemu Bilbilo	50	702	438
Kofele	27	486	320
Shashemene	15	407	223
Qore	5	370	249
Total	**97**	**579**	**391**

Seed availability

In 2013, on average, the amount of seed purchased from formal sources was about 89.4 kg per respondent (Table 4. There was some variation among the varieties. The highest was for Holker (7381.2 kg) followed by Misical-21 (3364.5 kg). Such seed purchase data was obtained because the study area is known for the amount of malt barley produced that is supplied to the Asella Malt Factory. Otherwise, in 2013, the total area covered with certified barley seed was minimal and limited to just 3.5% (91,617ha) in the Arsi region (CSA 2014).

Table 4. Quantity of certified seed purchased by farmers in the 2013/14 crop season

Variety	No. of farmers	Amount of certified seed purchased (kg)	Mean
Holker	60	7381.2	123.0
Beka	8	704.0	88.0
Sabini	15	1120.0	74.7
Miscical-21	34	3364.5	99.0
Bahati	11	1065.9	96.9
Bekoji-1	3	165.0	55.0
Mean			**89.4**

Farmers have frequently asked for certified seed from formal sources, but they do not receive the seed of the varieties of their choice for various reasons. These included seed shortage, no supplier at the local level, poor seed quality, high seed price, and untimely supply (Table 5). The majority of respondents mentioned seed shortage (61.9%) and no local supplier (27.4%) as the two main reasons for the failure to get seed as requested.

A Pearson's correlation analysis indicated that seed shortage has a significant ($p < 0.05$) association with total land holding and age of the household head (data not presented). Younger farmers have limited land holdings and they mainly rent from or share land with other farmers. For the rented land to be profitable, younger farmers would prefer to use the best inputs. Hence, they are more concerned about the shortage of seed of the variety of their interest. This is an important issue for the younger farmers that future interventions in malt barley production and supply should consider.

Table 5. Reasons for the failure to get certified seed of requested malt barley varieties (n = 113)

Reason	No of farmers	Proportion (%)
Seed shortage	70	61.9
Lack of supplier	31	27.4
Poor seed quality	11	9.7
High price	9	8.0
Untimely supply	8	7.1

*Reasons with response frequencies of less than five have been dropped

Farmers' perception of seed quality

A good quality seed has reasonable genetic potential, acceptable varietal purity, the ability to germinate and give uniform stands in the field, and freedom from seed borne pathogens and admixtures. Farmers have their own criteria for seed quality at the farm level. They listed five seed quality criteria for malt barley (Table 6). Farmers believe that a quality seed should have good field emergence and be free from admixtures, seed of other varieties, and other crops. About 58% of respondents mentioned field emergence and 56% freedom from admixture (n = 112) as important quality criteria for malt barley seed. A considerable proportion of the farmers also listed the existence of seeds of other varieties and other crops as indicators of the poor quality of a seed lot. This is very important since farmers are able to identify other varieties from the desired ones. Nearly half of the farmers who responded indicated that varietal mixture is an important quality criterion for them. The existence of diseased or discolored seeds in the seed lot was considered the least important quality criterion by the farmers.

Table 6. Farmers perception and criteria of seed quality (n = 112)

Quality criteria	No. of farmers	Proportion (%)
Good field emergence	65	58.0*
Freedom from admixture	63	56.3
Freedom from seed of other variety	46	41.1
Freedom from seed of other crops	34	30.4
Discoloration	3	3.0

Conclusion and Recommendation

Very few of the newly released varieties with acceptable malting quality that are available are known and used by farmers in the study areas. Using certified seed from formal sources has a positive effect on productivity. Seed shortages and quality issues need to be addressed properly to sustain malt barley production in such potential areas as Arsi and West Arsi. Younger farmers, who rent land from other farmers, mentioned seed shortage as the main constraint. It is particularly important to address the seed demands of young farmers as they will become the champions of sustainable malt barley production and supply. The perceptions of some farmers about the poor quality of seed from formal sources indicate that the seed growers have to focus on maintaining varietal purity and proper seed processing.

Acknowledgement

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MEETINGS AND COURSES

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

Conferences

International Conference on Pulses for Nutritional Security and Agricultural Sustainability

The Indian Society of Pulse Research and Development (ISPRD), in association with the Indian Institute of Pulses Research (IIPR), and under the patronage of the Indian Council of Agricultural Research (ICAR), New Delhi, will organize an *International Conference on Pulses for Nutritional Security and Agricultural Sustainability*. The conference will be organized 13–16 February 2016 in New Delhi, India and will draw the attention of world bodies to increasing legume production, thus furthering nutritional security and environment sustainability.

The conference will, address, among other issues, the critical gaps in understanding about production constraints, germplasm exploitation to identify novel genes for crop improvement, enhancing quality, tolerance against major biotic and abiotic stresses, developing resilient legumes against unpredictable threats resulting from climate change, the need for mechanization and farm machineries, post-harvest management, and value addition. The conference envisages that the applications of modern genomic tools and biotechnological interventions for the improvement of pulses will provide in-depth insights into the underlying adaptation mechanisms of pulses to diverse climatic conditions.

The conference will provide an exceptional opportunity to researchers, policy makers and executives, extension workers, traders, and entrepreneurs to discuss various strategies for nutritional security and environmental sustainability through pulse crops. Further, it will provide an opportunity for drafting a consensus road map for increasing the productivity and profitability of legumes over the next five years.

Please mail correspondence and direct any general enquiries to G.P. Dixit, Organizing Secretary, Indian Institute of Pulses Research, Kanpur 208 024, Uttar Pradesh, India; email: isprd.icp2016@gmail.com; website: www.iipr.res.in or http://www.isprd.in

Ninth International Wheat Conference 2015 (IWC 2015)

The *Ninth International Wheat Conference* will be held 20–25 September 2015 in Sydney, Australia. IWC 2015 includes an extensive program of plenary sessions, oral presentations, poster sessions, and a post-conference technical tour. A number of other related meetings will be held in association with IWC 2015, including the *2015 Borlaug Global Rust Initiative Workshop*. For more information please contact: IWC 2015 Conference Secretariat, ICMS Australasia Pty Ltd, GPO Box 3270, Sydney NSW 2001, Australia; email: info@iwc2015sydney.com; Website: www.iwc2015sydney.com/

AFSTA Congress 2015

AFSTA Congress 2014 will take place 3–5 March 2015 in Victoria Falls, Zimbabwe. For more information, kindly contact: AFSTA Secretariat at afsta@afsta.org.

2015 ISF World Seed Congress

The 2015 ISF World Seed Congress will take place 25–27 May 2015 in Kraków, Poland. Registration will open on 6 January 2015 at 11.00 h (GMT). For more information, visit: www.worldseedcongress2015.com

ISTA Annual Meeting 2015

The ISTA Annual Meeting 2015 will be hosted by the National Seed Institute (INASE) and held 15–18 June 2015 in Montevideo, Uruguay. The ISTA Annual Meeting provides an excellent opportunity to meet other seed experts and to exchange experiences. It also provides a chance for in-depth discussions about topics of interest to the ISTA community. For the 2015 meeting a one and a half day seminar will be held on '*Molecular tools applied to seed quality and seed health*'. This seminar will be an opportunity to receive the latest research and developments. Moreover, two ISTA workshops will take place in Colonia – '*Seed sampling and quality assurance in seed sampling*', and '*Tetrazolium testing and vigor by tetrazolium in glycine max*'. A limited number of exhibition stands are available.

For more information, please visit: www.seedtest.org

Courses

ICARDA courses

ICARDA organizes both short- and long-term courses in thematic areas related to its research portfolio on biodiversity and integrated gene management, integrated water and land management, diversification and intensification production systems, and socioeconomics and policy research. For more information on the ICARDA annual training program, contact: Mr. Charles Kleinermann, Head of Capacity Development Unit, ICARDA, Amman, Jordan. email: c.kleinemann@cgiar.org

UPOV course

New distance learning courses

In 2015, UPOV will launch a new DL-305 course '*Examination of applications for plant breeders' rights'* as a single course and as two component courses – DL-305A '*Administration of plant breeders' rights*'; and DL-305B '*DUS examination'*. The courses will be in English, French, and Spanish. The categories of participants for the DL 205 and DL 305 courses are as follows:

Category 1: Government officials of members of the Union endorsed by the relevant representative to the UPOV Council (*no fee)*
Category 2: Officials of observer states/inter-governmental organizations endorsed by the relevant representative to the UPOV Council (o*ne non-fee paying student per state/inter-governmental organization; additional students, CHF1000 per student)*
Category 3: Others (f*ee, CHF1000)*

Please note that the registrations of participants in Categories 1 and 2 must be accompanied by an endorsement from the representative to the UPOV Council of the UPOV member or observer, as appropriate, formally nominating the participant. More detailed information concerning course content and online registration is available on the UPOV website: http://www.upov.int/resource/en/training.html)

For further information about UPOV, please contact the UPOV Secretariat: tel: +41-22-338 9155; fax: +41-22-733 0336; email: upov.mail@upov.int; website: www.upov.int

ISTA training workshops

We have pleasure in drawing your attention to a number of upcoming ISTA workshops:
For more information contact: ISTA, Zurichstrasse 50, 8303 Bassersdorf, Switzerland; tel: +41 44 838 6000; fax: +41 44 838 6001; email: ista.office@ista.ch; website: www.seedtest.org

Free online course on agriculture, economics and nature

The University of Western Australia is offering a free online course on the economics of agriculture, natural resources, and the environment. This course is about agricultural production and the interaction between agriculture and the environment. The material presented can help us understand changes that have occurred in agriculture, and support improved decision making about things like agricultural production methods, agricultural input levels, resource conservation, and the balance between agricultural production and its environmental impacts.
The course will run for six weeks, starting 2 February 2015, with a different focus each week. A set of lecture videos, mostly between 5 and 10 minutes in length, are provided each week, together with readings, activities, student forums, quizzes, and a final examination. To register, go to http://courses.class2go.uwa.edu.au/ageconnature.
If you have any questions about the course, email mooc-are@uwa.edu.au.

LITERATURE

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

Books

ISTA. 2015. International Rules for Seed Testing

Published by ISTA, Geneva, Switzerland; ISSN 2310-3655; email: ista.office@ista.ch; website: www.seedtest.org

The International Seed Testing Association is a non-profit association whose primary purpose is to develop, adopt, and publish standard procedures for sampling and testing seeds, and to promote uniform application of these procedures for the evaluation of seeds moving in international trade. ISTA publishes the International Rules for Seed Testing, Seed Science, and Technology and a wide range of handbooks, including detailed techniques on all relevant topics in seed sampling and testing methodology. The ISTA International Rules for Seed Testing 2015 are now available online at: https://www.seedtest.org//stream/nl-l-
--1--%40a3a28d620689--438.html.

Full information, for both members and non-members, on how to access the online ISTA Rules is available at:https://www.seedtest.org//stream/nl
-l---1--%40a3a28d620689--439.html

Bewley, J.D., K. Bradford, H. Hilhorst, and H. Nonogaki. 2013. Seeds: Physiology of Development, Germination and Dormancy (3rd Edition)

Published by Springer; ISBN-13: 978-1461446927; Price (paperback): USD81.56.

This updated and much revised third edition of *Seeds: Physiology of Development, Germination and Dormancy* provides a thorough overview of seed biology and incorporates much of the progress that achieved during the past 15 years. With an emphasis on placing information in the context of the seed, this new edition includes recent advances in the areas of the molecular biology of development and germination, as well as fresh insights into dormancy, ecophysiology, desiccation tolerance, and longevity. Authored by preeminent authorities in the field, this book is an invaluable resource for researchers, teachers, and students interested in the diverse aspects of seed biology.

Baskin, C.C. and J.M. Baskin. 2014. Seeds: Ecology, Biogeography, and Evolution of Dormancy and Germination (2nd Edition)

Published by Elsevier Inc. ISBN-13: 978-0124166776; 1600 pp; Price (hard cover) USD129.18;

The new edition of *Seeds* contains new information on many topics discussed in the first edition, such as fruit/seed heteromorphism, breaking of physical dormancy, and the effects of inbreeding depression on germination. New topics have been added to each chapter, including dichotomous keys to types of seeds and kinds of dormancy; a hierarchical dormancy classification system; role of seed banks in the restoration of plant communities; and seed

germination in relation to parental effects, pollen competition, local adaptation, climate change, and karrikinolide in smoke from burning plants.
The database for the world biogeography of seed dormancy has been expanded from 3580 to about 13,600 species. New insights are presented on seed dormancy and the germination ecology of species with specialized life cycles or habitat requirements, such as orchids, parasitics, aquatic, and halophytes. Information from various fields of science is combined with seed dormancy data to increase our understanding of the evolutionary/phylogenetic origins and relationships of the various kinds of seed dormancy (and non-dormancy) and the conditions under which each may have evolved. This comprehensive synthesis of information on the ecology, biogeography, and evolution of seeds provides a thorough overview of whole-seed biology that will facilitate and help focus research efforts.

OECD. 2014. Climate Change, Water and Agriculture: Towards Resilient Systems
Published by OECD; ISBN; 9789264209138 (PDF); 9789264209121 (print); 100 pp. Website: http:// www.oecd-ilibrary.org/agriculture-and-food/climate-change-water-and-agriculture_9789264209138-en

This report reviews the main linkages between climate change, water, and agriculture as a means of identifying and discussing adaptation strategies for the better use and conservation of water resources. It provides guidance to decision makers on choosing an appropriate mix of policies and market approaches to address the interaction between agriculture and water systems under climate change. Interactions between climate change, water, and agriculture are numerous, complex, and regionally specific. Climate change can affect water resources through several dimensions. These include changes in the amount and patterns of precipitation, the impact on water quality through changes in runoff, river flows, retention, and thus loading of nutrients, and through extreme events, such as floods and droughts. These changes in the water cycle can, in turn, significantly affect agricultural production in practically all regions of the world and have destabilizing impacts for agricultural markets, food security, and non-agricultural water uses. There is, thus, a strong case for considering agricultural water management and policy in the context of climate change. In the same way, a sound analysis of mitigation and adaptation strategies in the agricultural sector to climate change should place more emphasis on the water cycle.

OECD-FAO Agricultural Outlook 2014
Published by OECD; ISBN: 9789264211742 (PDF); 9789264210899 (print)*; 323 pp. Website: http://www.oecd.org/site/oecd-faoagriculturaloutlook/publication.htm*

The Agricultural Outlook, 2014–2023, is a collaborative effort of the Organisation for Economic Co-operation and Development (OECD) and the Food and Agriculture Organization (FAO) of the United Nations.
This is the 20th edition of the Agricultural Outlook, and the 10th prepared jointly with the UN Food and Agriculture Organization (FAO). It provides market projections to 2023 for major agricultural commodities, biofuels, and fish across 41 countries and 12 regions. It includes OECD member countries (European Union as a region), key non-OECD agricultural producers (such as India, China, Brazil, Russian Federation, and Argentina) and groups of smaller non-OECD economies in a more aggregated form.

IFPRI. 2014. Global Nutrition Report 2014: Actions and Accountability to Accelerate the World's Progress on Nutrition
Published by IFPRI, Washington DC, USA; ISBN 978-0-89629-205-5; 402 pp. PDF (free download at http://www.ifpri.org/sites/default/files/publications/gnr14.pdf. Website: www.ifpri.org, free to download

Good nutrition is also central to the sustainable development agenda that is taking shape in the form of the Sustainable Development Goals (SDGs) now under discussion. Inherently sustaining, good nutrition flows throughout the life cycle and across the generations. It promotes individual resilience in the face of shocks and uncertainties generated by climate change and extreme price fluctuations. It supports the generation of innovations needed to meet the joint challenge of improving the lives of current and future generations in ways that are environmentally sustainable.
The Global Nutrition Report provides a global profile and country profiles on nutrition for each of the United Nations' 193 member states, and includes specific progress for each country. It will be a centerpiece of the Second International Conference on Nutrition (ICN2) in Rome, 19–21 November 2015, organized by FAO and WHO.

Websites

Agrogene

Agri-Biotech Public Education Website launched.

A new website, Agrogene, (www.agrogene.cn), initiated by the Chinese Society of Biotechnology, the Chinese Society of Plant Physiology and Molecular Biology, the Chinese Society of Agri-biotechnology, the Chinese Society of Crop Science, and the China Society of Plant Protection. The website is also the window of the Platform of Science Communication for Agricultural Biotechnology, which has been co-established by the five societies. The website seeks to build bridges between scientists and the media. Its long-term goals include changing the harsh public opinion environment to genetic modification and becoming an agri-biotech information exchange platform in China. Visit Agrogene at http://www.agrogene.cn/.

Food security portal

IFPRI has re-launched its food security portal (FSP) at (http://esa.ifpri.info/). The new and improved FSP makes global, regional, and country-level food price information and data more accessible and easy to share. The homepage now features an instant overview of price volatility levels for five major agricultural commodities – hard wheat, soft wheat, rice, soybeans, and maize. Its updated commodities section enables a comparison of a wider range of global price data, going back a full year. Now users can view the FSP in Spanish, English, or French and the new mobile design makes the FSP easy to view and navigate on any mobile device.

AFSTA

The African Seed Trade Association (www.afsta.org) was formally established in March 2000 with its headquarters in Nairobi, Kenya. AFSTA arose out of a need to have a regional representative body for the seed industry, which could also serve to promote the development of private seed enterprises. Currently, our membership stands at 97.

Newsletters

SeedQuest.

SeedQuest is a global information network for seeds. It provides comprehensive and up-to-date information about the seed industry, including news, events, seed suppliers, solutions, markets, directories, catalogues, resources, etc. For more information, visit the website at http://www.seedquest.com

Note to Subscribers

Subscribers are encouraged to play a proactive role in making this newsletter a useful platform for information exchange. Contributions are most welcome on the broad areas of seed system development; meetings, courses and electronic conferences; books and reviews; websites of special relevance to the seed sector; funding opportunities; requests to other readers for information and collaboration; and feature articles or discussion issues proposed by subscribers. The Editor always welcomes suggestions on format and content. Please send inputs by email to z.bishaw@cgiar.org