SEED INFO

Official Newsletter of WANA Seed Network

ICARDA

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EDITORIAL NOTE

Seed Info seeks to stimulate information exchange and regular communications between 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 which facilitate the development of a vibrant regional seed industry. In this issue of *Seed Info*, we report on the establishment of a Seed Technology Unit (STU) in Yemen. The STU is organized to make seed of targeted indigenous forage species available through better crop management practices, appropriate post-harvest technologies, and extensive capacity building. We also continue to report on seed courses conducted by the Seed Section of the International Center for Agricultural Research in the Dry Areas (ICARDA) to strengthen human resource development within the region.

In the **NEWS AND VIEWS** section, Niels Louwaars from the Dutch Seed Association, Plantum, presents an article entitled *Public-Private Partnerships in Research*. The article highlights the need for public-private partnerships in an era of declining government funding. Public funding is under pressure in many countries, and public research institutions and universities are under pressure to find other sources of funds. One way for government breeding programs to earn money is to license out their new varieties to private sector seed producers, based on the breeder's rights to these varieties. Where plant breeder's rights are not yet operational and where compulsory seed certification schemes are in place, breeders can also include a royalty payment in the price of high-value early generation (breeder's or basic/foundation) seed that they supply to multipliers. However, such high prices for basic/foundation seed may likely invite evasion of a strict application of the generation system in seed certification. Other news in this section comes from regional and/or international organizations, such as the International Seed Federation (ISF), the African Seed Trade Association (AFSTA), the International Seed Testing Association (ISTA), and the International Union for the Protection of New Varieties of Plants (UPOV).

The section on **SEED PROGRAMS** includes news from Egypt, Ethiopia, Pakistan, and India. The report covers the 2013 Biotechnology Day organized by the Egyptian Biotechnology Information Center (EBIC) and hosted by Cairo University. From Ethiopia, we report on the launch of the Advanced Maize Seed Adoption Program by DuPont. This is a public-private collaborative initiative in Ethiopia, which will boost maize productivity among smallholder farmers. With an investment of more than USD4 million over the next three years, this initiative will help increase food production for local communities. There are also reports on the release of cereal and legume varieties from productive partnerships between international agricultural research centers and the national agricultural research systems of Ethiopia, Pakistan, and India. It is expected that when seed of these new high-yielding and (a)biotic stress-tolerant varieties become available to farming communities at large, famers will achieve increasing agricultural production and productivity and be able to ensure food and nutritional security in their respective countries.

The **RESEARCH** section of *Seed Info* captures information on adaptive research on issues relevant to developing seed programs in the CWANA region and beyond. This issue features an article entitled *Establishing Community-based Small-scale Seed Production Scheme in Metekel Zone, Benishangul Gumuz Regional State, Ethiopia* by Melaku et al. from Pawe Agricultural Research Center (PARC), Ethiopia. This paper discusses the efforts of PARC to establish community-based seed production to make the seed of new legume varieties available to farmers in Metekel Administrative Zone (MAZO), northwestern Ethiopia.

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.

Have a nice read!

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 Establishes Seed Technology Unit in Yemen

ICARDA, through its Arabian Peninsula Regional Program (APRP), initiated an extensive research and technology transfer program to identify and promote local production and use of indigenous forage species for feed production and range rehabilitation. The goals are to save the scarce water resources in the region, minimize soil degradation, and conserve and use local plant flora and biodiversity. ICARDA implemented the project 'Technology Transfer to Enhance Rural Livelihoods and Natural Resource Management' in close cooperation with the national agriculture research and extension systems in the countries of the AP. The International Fund for Agricultural Development supports the project.

Seed multiplication and distribution of improved indigenous forage species are major components of the project. It is planned to establish Seed Technology Units (STUs) in the United Arab Emirates, Oman, Saudi Arabia, Qatar, and Yemen. The STUs will make the seed of targeted species available through improved crop management practices, appropriate post-harvest technologies, and extensive capacity building.

The project provided seed processing facilities, technical backstopping, and training. Five staff members of the National Center for Livestock Research, located in Lahaj, participated in the practical sessions on the assembly, testing, and demonstrations of the seed threshing and cleaning machinery provided by the project.

In Yemen, the STU was establsihed in Lahj. The project provided the following machines:

- Kimseed Multi Seed Thresher CW08 – comprising threshing, pre-cleaning and aspiration facilities – which is used for a wide range of field, forage, and pasture crops
- Kimseed Seed Cleaner MK3 – comprising screens and aspiration system – which is used for the fine cleaning of a wide range field, pasture, and forage crops
- Vacuum Separator – comprising a Multiseed Venturi with Flow Attachment – for the precision cleaning and grading of seed into different categories based on specific weight
- Hand held screens – comprising a set of manual screens stacked on top of each other – which make it easy to clean seeds.

During the training session, the participants were taught how to assemble the components of each machine. They then tested them in threshing, cleaning, and grading the seeds of *Cenchrus ciliaris* and fodder sorghum, following a learning-by-doing approach.

STUs require seed quality control amenities to complement these facilities. After processing, information on the physical purity, moisture content, viability, and germination precentage of the seed will be needed. A general purpose laboratory with a germinator, benches, analytical balance, petri dishes, and filter paper are available in the National Center for Livestock and can be used for quality control purposes. However, a short term training is needed to provide the STU staff with the necessary seed testing skills.

Hands-on practical training with Kim Seed Cleaner

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ICARDA Organizes Seed Courses

A well-functioning formal seed system is comprised of key components along the seed value chain within the agricultural research for development continuum. However, national seed systems in developing countries are characterized by ineffective policy and regulatory frameworks,

inefficient institutional and organizational arrangements, deficiencies in infrastructure, limited resource allocation, limited trained and motivated human resources, etc. These inherent weaknesses are limiting farmers' access to quality seed of many crops. Management of the variety release system, arrangements for early generation seed production (breeder, basic), and seed certification schemes remain major constraints to national seed program development. For example in the CWANA region, very few countries have independent variety release mechanisms, seed certification schemes, and well organized early generation seed production. The establishment of an effective, transparent, and independent national variety release mechanism will enhance the flow of new varieties from research institutions. A seed certification scheme will ensure the supply of quality seed from NARS to seed companies and, eventually, to farmers. The result will be increased production and productivity, food security, and better incomes for farmers. In this regard, the role of trained and skilled human resources in leading and managing the seed sector is crucial.

Regional Course on Variety Identification, Maintenance, Quality Seed Production, and Certification, Cairo, Egypt

Variety description for registration and release, variety maintenance for quality seed production, and seed certification for quality assurance are specialized tasks where technical capacity and managerial expertise are required at the national level. This course was designed to improve the national capacity to conduct value for cultivation and use (VCU), to determine agronomic performance, and establish the distinctness, uniformity, and stability (DUS) required for variety registration for release.

Course organization

The course was organized from 21 April to 2 May 2013 in close collaboration with the Central Administration for Seed Certification (CASC). Apart from CASC, agricultural research centers (ARCs) and the Central Administration for Seed Production (CASP) and its staff also participated in the course as resource persons for the lectures; and they arranged the practical sessions and field visits.

Course program

The course program blended theoretical lectures with practical sessions and field visits relevant to variety description and maintenance as well as quality seed production and certification. Theoretical lectures delivered first hand were followed by presentations by national resource persons to contextualize their application in a national setting, taking into account the Egyptian seed system. The lectures were followed by hands-on practical sessions and visits to fields and/or laboratories. These activities provided the attendees with a better understanding of the lectures, helped them acquire the necessary skills in the subject, and placed the application in a national setting.

Apart from ICARDA, CASC, ARC, and CASP staff, the resource persons included staff from the Agricultural and Genetic Engineering Research Institute (AGERI) and the National Genebank of Egypt. Resource persons from these institutions delivered theoretical lectures, guided the discussions, and accompanied participants for the hands-on practical training. Field visits were made to ARC (for variety development, variety maintenance, and foundation seed production), to CASP (for seed production, processing, and storage), to CASC (for DUS trails, field inspection, control plots, and laboratory seed testing), and to AGERI (for biotechnology laboratory) facilities in Giza and Kafir El-Sheikh.

Participants of the course also made presentations on the status of the national seed industry in their countries and shared their experiences with their fellow participants. The participants were tasked to prepare proposals addressing the constraints identified in a SWOT analysis of their national seed programs, their present responsibilities, and the anticipated developments of the national seed sector. The purpose of the exercise was to enable the participants to identify gaps and prepare a proposal based on the knowledge acquired through the lectures, practical sessions, field visits, and country reports presented during the course. The proposals were expected to enable the participants to translate the theory into practice and prepare projects to address the issue at the national level.

Course participants

The course participants were the technical staff involved in variety evaluation and maintenance from NARS and seed production and certification officers from national seed programs. A total of 15 participants from 10 countries – Algeria (1), Egypt (2), Ethiopia (3), Jordan (1), Lebanon (1), Palestine (1), Sudan

(1), Syria (2), Tunisia (1) and Yemen (2) – participated in the course. Of the participants, three (20%) were women who are involved in the key components of their national seed system – plant breeding, variety maintenance, and seed production.The Arab Fund for Social and Economic Development funded 12 participants from national agricultural research and seed programs in Arab countries. The USAID seed project supported three participants from Ethiopia.

Participants of regional seed course, Cairo, Egypt

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In-country Course on Variety Identification and Maintenance, Erbil, Kurdistan Regional Government (KRG), Iraq

The Japanese International Cooperation Agency is implementing a project on Wheat Productivity Improvement Towards Food Self-sufficiency in collaboration with the Ministry of Agriculture and Water Resources, KRG, Iraq. ICARDA is providing technical support. It is strengthening the human resources and providing training in seed science and technology as one of the components of the human resources development program. The project covers a wide range of courses in seed science and technology.

Course organization

The course was organized from 21-26 April 2013 in close cooperation with the Seed Department and Agricultural Research Department of the Ministry of Agriculture and Water Resources, KRG, Iraq.

Course program

Variety identification is essential for variety release, to maintain the varietal identity during seed production and certification, and in grain production, trading, processing, and end-product consumption. The course provided the technical know-how on DUS testing and its implications for variety release, registration, maintenance, foundation seed production, and certification. The course program consisted of classroom lectures and practical sessions on DUS testing and variety maintenance.

Course participants

Twelve participants from all the provinces of KRG, Iraq attended the course. They were mostly plant breeders and field inspectors involved in quality seed production and certification

Participants of in-country seed course, Erbil, KRG, Iraq

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NEWS AND VIEWS

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

Public-Private Partnerships in Research

Government funding is under pressure in many countries, and public research institutions and universities are under pressure to find other sources of funds. One way for government breeding programs to earn money is to license their new varieties to private sector seed producers based on the breeder's rights of these varieties. Where plant breeder's rights (PBR) are not yet operational, and where compulsory seed certification systems are in place, breeders can

also include a royalty payment in the price of high-value early generation (breeder's or basic/foundation) seed that they supply to multipliers. However, such high prices for basic seed are more likely to invite evasion of a strict application of the generation system in seed certification.

Partnerships between public breeders and private seed companies, based on PBR, can also include more exclusive arrangements which help seed producers invest in promoting new varieties. Introducing a new variety requires investment in managing the different varieties in seed production and processing and, particularly, in promoting the variety in the market. Without exclusivity, seed producers are not likely to make such investments because as soon as a new variety becomes popular, producers who have not invested may take over the market. Such exclusivity may be based on tenders, whereby seed companies may bid for exclusive access to a new variety after it has been registered. The National Agricultural Research Organisation in Uganda once gave out maize hybrid and open-pollinated seed to different seed producers 'blindfolded'. Each registered company received an exclusive set of varieties in a kind of lottery. Whatever distribution approach is chosen, there has to be an obligation to start producing that variety, otherwise the license will be withdrawn. A case has been reported from Morocco where a new variety was shelved and foundation seed of an old variety was instead imported for commercial seed production.

A more advanced way is to involve seed producers earlier in the process. An example of such an arrangement is the agreement between ICRISAT and a consortium of seed companies in India to jointly steer and fund sorghum and millet breeding. In this approach, the consortium members have preferential access to the materials so developed. This requires a competitive seed sector, with companies that have both the funds and the vision to invest jointly in research and development. Such arrangements are particularly useful for small and medium enterprises that do not have all the technologies needed for real breakthrough innovations in-house. Through such public-private partnerships they acquire access to advanced technologies, such as genetic marker systems. Such consortium agreements have to be carefully crafted. They must define clearly the rights and obligations of the parties and make sure that the public sector organization can maintain its public roles, while giving the private sector partners the benefits that they need to warrant their investments in the cooperation.

A similar balance has to be sought in public-private partnerships in higher-end research, such as the development of new traits for further breeding. Such partnerships may lead to patents. The patents themselves, or at least the use rights to the technologies, need to be spelled out in detail in the partnership agreement. The balance is commonly based on the relative funding levels between the partners and the knowledge brought into the project. With full contract research, where the company funds research executed by the university, the company may claim all the rights. When both government and the private sector share the costs, the company may get a first say in whether it wants to have a license (exclusive or not). Often, the public sector parties have the upper hand in the technologies and the private sector is more effective in downstream product development. However, in industrialized countries, public-private partnerships increasingly involve research done jointly by the public and the company laboratories; the scientists collaborate at an equal level. Apart from the technical capacity and efficiency of the university laboratories, one reason for the private partners is the maintenance of an excellent public research infrastructure. This public infrastructure is required to educate the next generation of researchers, which the companies need.

Public-private partnerships in breeding and breeding research are very important as they increase the productive use of new knowledge in the breeding chain. Unhealthy competition between the public and private sectors is avoided, and the further research and education capacities of the public sector are strengthened. Public-private partnerships require clear and consistent agreements between the parties with respect to the inputs and the rights to the outputs of the research. Only then will, the private sector co-invest in such partnerships, and the public sector maintain its impartial public role.

One major warning for policy makers is that agricultural research has an important task to develop technologies that can further society through commercial innovation chains. However, there are also societal objectives that require other innovation systems. Plant breeding

is a good example. Commercial seed producers may exist for high-value crops (like maize and vegetables), but not for other crops that may also be important for food security and smallholder farmers (such as cowpeas, lentils, and oats); crops that do not attract a lot of commercial interest. Focusing on public-private partnerships should not lead to public research bypassing such important crops and target groups.

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AFSTA Congress Attracts 225 Delegates

The 13th African Seed Trade Association (AFSTA) Annual Congress was held 3-6 March 2013 in Balaclava, Mauritius. Two hundred and twenty five delegates from 39 countries actively participated in the congress, which proved to be an excellent avenue to explore seed businesses and strengthen the network between the seed stakeholders.

The Minister of Tertiary Education, Science, Research, and Technology of the Republic of Mauritius, the Honorable Dr. Rajeshwar Jeetah, graced the opening ceremony. He emphasized the importance of the seed sector in helping Africa nations to achieve food security and called on the delegates to continue deploying their efforts to deliver quality seeds to farmers.

The congress discussed various important items for the African seed industry with a view to analyzing the current situation and charting the way forward for seed sector development. The following topics were addressed during the congress:

- The latest developments in the African Regional Intellectual Property Organization (ARIPO) and ARIPO's protocol for Plant Variety Protection
- The West African Seed Program (WASP)
- The status and implementation of the Common Market for Eastern and Southern Africa (COMESA) harmonized seed regulations.
- The use of information and communication technology in enhancing agricultural productivity and a demonstration of the use of AFSTA's website and the available tools
- Stewardship of seed treatment
- Understanding the maize lethal necrosis disease (MLND) situation in Kenya and the implications for food security in the region
- A comparative analysis of the African seed industry relative to the rest of the world and the recommendations for AFSTA
- Strengthening vegetable breeding in Africa: Access to traits at the World Vegetable Center
- World food security and the DuPont global food index

All these presentations attracted full houses with the delegates actively contributing to the debates and discussions.

The opening ceremony of African Seed Congress 2013

The representatives of regional and international organizations attending the congress included International Seed Federation, Asia Pacific Seed Association, International Seed Testing Association, Organisation for Economic Co-operation and Development, Union for the Protection of New Plant Varieties, Food and Agriculture Organization, ARIPO, COMESA, and the Pan-African Intellectual Property Organization.

Two special interest groups on 'Field Crops' and 'Vegetables' were launched during the meeting of the National Seed Trade Associations and seed companies, held on the afternoon of 4 March 2013.

The AFSTA General Assembly 2013 elected the AFSTA Board, chaired by Mr. Jitu Shah, with 13 members, who will serve until the next General Assembly in March 2014. Six new members of AFSA were also approved. The delegates looked forward to the next congress, which will be held in Tunis, Tunisia, 4-7 March 2014.

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International Seed Federation (ISF) World Seed Congress in Athens, Greece

With 1583 participants, from all continents, the 2013 ISF World Seed Congress in Athens, Greece celebrated a new record. The congress provided an excellent venue for people working with seeds to converse, learn, network, and do deals. ISF is a strong believer in the benefits of the global movement of seeds to improve grower success around the world. In recent years, services to ISF members have gone up while the congress registration fee had gone down.

The technical meetings during the congress were opportunities for the industry to promote and share best practices. The meetings were fora for debate and for receiving the latest updates. ISF's main goal is to facilitate the international seed trade and there were high-level presentations on recent developments. Presentations were made by representatives of the Commission on Phytosanitary Measures, the Nagoya Protocol, the OECD, the International Treaty on Plant Genetic Resources for Food and Agriculture, the ISTA, the Global Crop Diversity Trust, and the International Plant Protection Convention. All these organizations have a potential impact on the seed industry and ISF has contributed to shaping them. Intellectual property and its enforcement were center stage during the Forage and Turf Section meeting. The participants received interesting updates from UPOV and the Breeders Trust.

A panel discussion led to animated debates in the meeting of the Field Crops Section. The panelists discussed the outcome of the ISF publication 'Collection Systems for Royalties in Wheat–An International Study'. The importance of the Incoterms® was underlined in the meeting of the Trade and Arbitration Rules Committee. The Seed Applied Technologies Committee dedicated ample time for a presentation on the Compass report, outlining the socioeconomic value of neonicotinoid seed treatment. The Vegetable and Ornamental Section heard interesting presentations on how to do business in China and the SolCAP project. ISF's work on an International Standard for Phytosanitary Measures specifically for seeds was an important topic during the meeting of the Phytosanitary Committee. During the congress, ISF adopted two position papers: the 'ISF View on Low Level Presence in Seed' and the 'ISF Viewpoint on Indirect Seed Health Tests'.

As is traditional, the Trading Floor was buzzing with activity, underlining the importance of the ISF World Seed Congress for international trade.

During the closing Gala Dinner, the Greek Minister of Agriculture, Mr. Athanasios Tsaftaris, addressed the audience on the importance of high-quality seed and the investment possibilities in Greece.

The next ISF World Seed Congress will take place in May 2014 in Beijing, China.

Participants of the meeting of Secretariats of National and Regional Seed Associations

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30th International Seed Testing Association (ISTA) Seed Congress in Antalya, Turkey

Last year Antalya hosted the 2012 ISF World Seed Congress, which focused on international seed trade. This year Antalya hosted the 2013 ISTA Congress where the emphasis was on seed science and technology. It would appear that Turkey is emerging as one of leading countries in the global seed industry.

The 30th ISTA Seed Congress, held 12-18 June 2013 in Antalya, Turkey attracted over 405 participants from more than 60 countries. The congress started with the ISTA Seed Symposium –11-14 June 2013 – where recent findings in seed science and technology where presented orally (35) and through posters (137). These were accompanied by product displays by some seed equipment manufacturers and suppliers. Abdoul Aziz Niane and Z. Bishaw of the ICARDA staff and P.C. Struik, made a presentation entitled '*Effects of temperature, relative humidity and moisture content on seed longevity of*

shrubby Russian thistle (Salsola vermiculata) in Syria', which was well received.

The seed symposium was followed by the ISTA regular meeting when its Technical Committee's (TCOM) reported on various thematic areas regarding the development of new methods and procedures. These were discussed and presented for consideration for inclusion in the International Rules for Seed Testing.

The congress culminated with the ISTA Ordinary General Meeting attended by member laboratories of ISTA. The meeting adopted the ISTA strategy and international rules for seed testing and elected a new Executive Committee representing different geographic regions of the world.

Several international, regional, and national organizations attended the meeting. Among these were representatives of the European Union, FAO, ICARDA, OECD, UPOV, APSA, AFSTA, and Turkish Seed Union.

The next ISTA Annual Ordinary General Meeting will be held in 2014 in Edinburgh and in 2015 in Uruguay. The 31st ISTA Seed Congress will be held in 2016 in Estonia.

International Union for the Protection of New Varieties of Plants (UPOV)

New UPOV member: Serbia

Serbia deposited its instrument of accession to the 1991 Act of the UPOV Convention on 5 December 2012, and became the 71st member of the Union on 5 January 2013. The status of states and inter-governmental organizations in relation to UPOV can be found at http://www.upov.int/export/sites/upov/members/en/pdf/status.pdf.

Decision on plant breeders' bill for Zanzibar (united republic of Tanzania)

The UPOV Council at its 46th ordinary session, held in Geneva, 1 November 2012, decided that the PBR Bill of mainland Tanzania (United Republic of Tanzania), subject to certain modifications, was in conformity with the provisions of the 1991 Act of the UPOV Convention. The PBR Act for mainland Tanzania was adopted 5 November 2012 and published 1 March 2013. The UPOV Council at its 13th extraordinary session, held in Geneva, 22 March 2013, decided that the Plant Breeders' Rights Bill for Zanzibar, subject to certain modifications, was in conformity with the provisions of the 1991 Act of the UPOV Convention. The Council noted that, once the draft law for Zanzibar was adopted, breeders' rights would cover the whole territory and the United Republic of Tanzania could become a UPOV member.

Adoption of documents

The Council adopted the revisions of the documents UPOV/INF/4 'Financial Regulations and Rules of UPOV' and UPOV/INF/15 'Guidance for Members of UPOV on Ongoing Obligations and Related Notifications and on the Provision of Information to Facilitate Cooperation'.

Seminar on essentially derived varieties (EDVs)

The Council endorsed organization of a seminar on EDVs, to be held in Geneva, 22 October 2013. The seminar would consider the technical and legal views on EDVs and the possible impact on breeding and agriculture, the existing experience in relation to EDVs, and the possible role of future UPOV guidance on EDVs in cases before the courts. The seminar will be open to the public, with presentations and discussions at the seminar being made available on the UPOV website after a suitable broadcast delay.

Contribution to a multi-stakeholder team on public-private partnerships in pre-breeding

Following a request from the Food and Agriculture Organization of the United Nations (FAO) and a number of other functional units, especially the International Treaty on Plant Genetic Resources for Food and Agriculture, UPOV members agreed to the UPOV Office working as part of a multi-stakeholder team on the 'definition of mechanisms for enhancing public-private partnerships in pre-breeding'.

Test guidelines

The Technical Committee adopted 14 new UPOV Test Guidelines for the Conduct of Tests for Distinctness, Uniformity, and Stability (Test Guidelines) (coriander, flax-lily, eucalyptus, kumquat, hebe, lobelia, lomandra, tree peony, pomegranate, pineapple, oyster mushroom, sesame, foxtail millet, and tomato rootstocks) and 10 revised Test Guidelines (common vetch, gladiolus, endive, watermelon, osteospermum, phalaenopsis, African lily, lettuce, spinach, and tomato). UPOV has now developed 295 Test Guidelines, all of which are freely available on

the UPOV website (http://www.upov.int/test_guidelines/en/.

UPOV databases

The information concerning PBRs provided in the Plant Variety Database (PLUTO) is freely accessible on the UPOV website, subject to registration (http://www.upov.int/pluto/en/). A video tutorial explains the new variety denomination feature, which includes a denomination similarity tool provided by the Community Plant Variety Office of the European Union.

UPOV office

On 1 April 2013, Mr. Ben Rivoire was appointed as Technical/Regional Officer for Africa and Arab countries and Mr. Leontino Taveira was appointed as Technical/Regional Officer for Latin America and Caribbean countries.

For further information about UPOV, please contact UPOV Secretariat: Tel: +41-22-338 9155; Fax: +41-22- 733 0336; E-mail: upov.mail@upov.int; Website: www.upov.int

Global Status of Commercialized Biotech/ GM Crops: 2012

The biotech crop area increased by an unprecedented 100-fold, from 1.7 million ha in 1996 to a record of 170.3 million ha in 2012. With an annual growth rate of 6%, it has increased by 10.3 million from the 160 million ha in 2011. This makes biotechnology the fastest adopted crop technology in recent history.

In the period 1996 to 2012, millions of farmers in over 30 countries worldwide, made more than 100 million independent decisions to plant an accumulated area of more than 1.5 billion ha – 50% more than the land mass of the US or China. This demonstrates the trust and confidence of millions of risk-averse farmers in biotech crops, which deliver sustainable and substantial, socioeconomic and environmental benefits.

Two new countries, Sudan (Bt cotton) and Cuba (Bt maize) planted for the first time in 2012. In 2012, of the 28 countries that planted biotech crops, 20 were developing and eight were industrial countries; this compares with the 19 developing and 10 industrial countries of 2011.

In 2012, a record 17.3 million farmers, up 0.6 million from 2011, grew biotech crops – remarkably over 90%, or more than 15 million, were small resource-poor farmers in developing countries. Farmers are the masters of risk aversion and in 2012, a record 7.2 million small farmers in China and another 7.2 million in India, elected to plant almost 15 million ha of Bt cotton, because of the significant benefits it offers.

For the first time, developing countries grew more of the global biotech crops (52%) in 2012 than industrial countries (48%). In 2012, the growth rate for biotech crops was at least three times as fast and five times as large in developing countries, at 11% or 8.7 million ha, versus 3% or 1.6 million ha in industrial countries.

Stacked traits are an important feature – 13 countries planted biotech crops with two or more traits in 2012 and, encouragingly, 10 of the 13 were developing countries In 2012, of these crops, 43.7 million ha, or more than a quarter, of the 170 million ha, were stacked. Brazil, for the fourth consecutive year, was the engine of growth globally, increasing its area of biotech crops more than any other country – an impressive record increase of 6.3 million ha, up 21% from 2011, reaching 36.6 million ha.

The US continued to be the lead country with 69.5 million ha, with an average 90% adoption across all crops. The impact of the 2012 US drought on maize was a 21% loss in productivity and for soybean, a 12% loss. Canada had a record 8.4 million ha of canola at a record 97.5% adoption.

India grew a record 10.8 million ha of Bt cotton with an adoption rate of 93%, while 7.2 million small resource-poor farmers in China grew 4.0 million ha of Bt cotton with an adoption rate of 80%, cultivating on average 0.5 ha per farmer. India enhanced farm income from Bt cotton by USD12.6 billion in the period 2002 to 2011 and by USD3.2 billion in 2011 alone.

Africa continued to make progress, with South Africa increasing its biotech area by a record 0.6 million ha to 2.9 million ha. Sudan joined South Africa, Burkina Faso, and Egypt, to bring the total number of African biotech countries to four.

Five EU countries planted a record 129,071 ha of biotech Bt maize, up 13% from 2011. Spain led the EU with 116,307 ha of Bt maize, up 20% from 2011.

From 1996 to 2011, biotech crops contributed to food security, sustainability, and

climate change by: increasing crop production to a value of USD98.2 billion; providing a better environment, by saving 473 million kg a.i. of pesticides; conserving biodiversity by saving 108.7 million ha of land; and alleviating poverty by helping over 15 million small farmers and their families. Biotech crops are essential, but are not a panacea and adherence to good farming practices, such as rotations and resistance management, are a must for biotech crops as much as they are for conventional crops.

The absence of appropriate, science-based, and cost/time-effective regulatory systems continues to be the major constraint to adoption. *Responsible, rigorous, but not onerous*, regulation is needed for small and poor developing countries.

The global value of biotech seed alone was ~USD15 billion in 2012. Modest annual gains are predicted because of the already high rate of adoption in all the principal crops in mature markets in both developing and industrial countries.

Source: ISAAA Brief 44-2012

Heterogeneity Testing Calculator for Seed Lots in Multiple Containers

The Heterogeneity Testing Calculator is a Microsoft® Excel workbook which can be used to detect heterogeneity which would make a seed lot technically unacceptable for sampling for the issuance of an Orange International Seed Lot Certificate (OIC). The calculations carried out in this workbook are in accordance with the procedures published in the ISTA International Rules for Seed Testing, Chapter 2.9 (Heterogeneity testing for seed lots in multiple containers).

The ISTA Statistics Committee and the ISTA Bulking and Sampling Committee have elaborated a Heterogeneity Testing Calculator in Excel. The latest version of the calculator, version 1.5, is now available for free download on the ISTA website https://www.seedtest.org/stream/nl-l---1--%40a3a28d620689--320.html.

In addition to this new tool, more very useful statistics tools for seed testing are available for free downloading at the same link.

University of Western Australia Engineers Tackle Sandalwood Seeding Challenge

Researchers behind a new study into the mechanized distribution of the sandalwood tree's large and irregular seed believe engineering could drive a revolution to meet Australia's agricultural needs.

The results of the sandalwood study, to be published in the journal *Biosystems Engineering*, were borne out of a need to reproduce the unique and increasingly in-demand crop with the immediate focus on land rehabilitation projects.

Sandalwood rehabilitation projects currently depend on manual labor to plant the seed in remnant bush land. The reason for this is that the large and variable size of the sandalwood seed poses a significant challenge for mechanizing the seed sowing process. Commercially available seed meters are designed for small uniform seed, such as corn.

Sandalwood (*Santalum*) is hemi-parasitic in nature, which makes it dependent on nutrients and water from the roots of neighboring trees. Native sandalwood (*Santalum spicatum)* depends on trees such as the native wattle. Over the last 150 years, there has been a decline in natural sandalwood stands in the grain belt of Western Australia because of land development, unsustainable harvesting practices, and a decline in the Woylie population, a native Western Australia marsupial and a natural propagator of the sandalwood tree.

A study on the specific requirements of a mechanical seed meter for sandalwood was undertaken as a final year project by student Dylan St Jack under the supervision of Associate Professor Dianne Hesterman and Assistant Professor Andrew Guzzomi from UWA's School of Mechanical and Chemical Engineering.

They have discovered that sandalwood seeds can be accurately metered through vacuum singulation techniques, an established mechanical method of precision seeding. The published results discuss the design of a modified seed meter for sandalwood and detail links between the dynamic behavior of the seed pool, the meter speed, and the performance of the meter.

The results of this study are a big step closer to developing a single pass seeding process for sandalwood rehabilitation which will allow larger areas to be seeded, ensure consistent seed spacing, and minimize the impact on native flora and fauna. The meter could also be adapted for use on commercial sandalwood plantations.

This project highlights the link between agriculture and engineering that is so important

for Australia's future in terms of food security, rehabilitation, and sustainability.

Seed of sandalwood (Santalum spicatum)

Cora Castens, UWA, 35 Stirling Highway, Crawley WA 6009, Australia; E-mail: ioa@uwa.edu.au

Seedburo Releases 2013 Catalog

Founded in 1912, Seedburo quickly became the largest distributor of seed breeding, feed production, and grain handling related equipment in the United States. Seedburo first began exporting equipment worldwide in 1940 through an extensive network of international representatives and continues to ship to over 100 countries today.

Seedburo distributes and has proprietary rights to many lines of equipment to these agricultural industries. Some of their products are the Vac-A-Sample pneumatic sampler, seed and grain sampling probes, triers and dividers, Seedburo pellet durability testers, Count-A-Pak seed counters, and germinators and related accessories. They also offer Dickey-john, Steinlite, and Burrows moisture testers, grain viewers, and ergonomic inspection stations, South Dakota and General seed blowers, seed cleaners, and many other seed and grain related products.

The Seedburo Equipment Company's extensive line of equipment can be found in their new catalog, which was released in January 2013. If you have not received your copy, or would like to receive a flash drive with a PFD copy of the catalog, please visit their website at www.seedburo.com and fill out a request form, or e-mail them at sales@seedburo.com. As a world leader in seed, feed, and grain grading, testing, and handling equipment, Seedburo prides itself on providing quality, state-of-the-art equipment.

For more information, you may contact: Seedburo Equipment Company, 2293 S. Mt. Prospect Road, Des Plaines, IL 60018-1018 USA; Tel. +1-312-738-3700; Fax +1-312-738-5329; E-mail: sales@seedburo.com; Web site: www.seedburo.com

Monsanto Commits an Additional USD3 Million for International Scholars Program

Monsanto Company has announced a USD3 million additional commitment grant to Monsanto's Beachell-Borlaug International Scholars Program (MBBISP). The additional commitment to this important program, focused on training the next generation of global rice and wheat plant breeders. To date, the MBBISP program has supported 52 students from 21 different countries. With the additional commitment of USD3 million Monsanto's total program investment equals USD13 million and will fund the program through 2016.

Started in 2009, MBBISP is named in honor and celebration of the accomplishments of Dr Hank Beachell and Dr Norman Borlaug, two preeminent plant breeders in rice and wheat, respectively. Their research has been instrumental in reducing hunger for billions of people who rely on rice and wheat for their daily nutrition.

Over the next three years, the program, which is administered by Texas AgriLife Research, an agency of the Texas A&M University System, will continue to help identify outstanding young scientists and support them with Ph.D. training in advanced plant breeding techniques. The program will also support at least one season of field experience in a developing country, and leadership development. Current MBBISP scholars at universities with doctorate programs in rice or wheat breeding are focusing their research on critical constraints affecting rice or wheat production.

Selection of the students is made by a panel of preeminent judges representing some of the most accomplished scientific leaders in rice and wheat breeding. The goals of MBBISP are to (1) aid in the development of highly educated rice and wheat breeders who can serve as future leaders in the field of agriculture and (2) provide

opportunities for young scientists to experience the important work and mission of public sector research institutions, particularly in developing countries. More information on MBBISP is available at www.monsanto.com/mbbischolars and on Monsanto at www.monsanto.com.

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.

Egypt Celebrates Biotechnology Day

Cairo University hosted the 2013 Biotechnology Day organized by the Egyptian Biotechnology Information Center, 20 April 2013.The program consisted of a brief introduction to biotechnology, including its applications and benefits. Some of the students demonstrated their graduation projects including anti-cancer, bioluminescent bacteria, bioremediation, and genetically modified organisms.

The students performed a play, *'Milestones of Biotechnology',* to celebrate the occasion. The play featured four major events in the field of biotechnology: 60 years since the discovery of the structure of DNA, 30 years since the production of the first transgenic plant, 30 years since the discovery of the polymerase chain reaction (PCR), and 10 years of work on human genome sequencing.

For more information about biotechnology events in Egypt, you may contact Dr Naglaa Abdallah; E-mail: naglaa_a@hotmail.com

DuPont Launches Initiatives in Ethiopia to Help Farmers Produce More Food

Advanced Maize Seed Adoption Program

DuPont has launched collaborative initiatives in Ethiopia that will boost maize productivity among smallholder farmers and help increase food production for local communities. The investment will total more than USD4 million over the next three years.

DuPont is committed to collaboratively tackling food security challenges. It is working with United States Agency for International Development (USAID) and the Government of Ethiopia (GoE) to increase productivity for maize farmers to advance the agricultural development and food security goals set by the GoE. The Advanced Maize Seed Adoption Program (AMSAP) will provide sample seed to demonstration plots and field training sessions. It will also build a network of farmer dealers and the current cooperatives to advance the use and acceptance of high-quality inputs and production techniques. The AMSAP also includes facilitating credit and grants for the construction of seed and post-harvest storage facilities.

This DuPont-USAID partnership enhances the ability of smallholders to increase production and improve their livelihoods in a way that will contribute to achieving the goals set forth in the Growth and Transformation Plan. This program focuses on smallholder farmers and exemplifies the public-private partnership envisioned in the Feed the Future Initiative and the G-8 New Alliance for Agriculture and Nutrition. It is a model for countries and private sector partners and shows that companies can invest responsibly and grow in the emerging African market.

AMSAP's goals are to help enhance the incomes of 35,000 smallholder maize farmers in 16 *woredas* (districts) over three regions and to scale up a network for sustainable seed distribution. By switching from open-pollinated maize seed to hybrid seed and using improved farming inputs and techniques, participating farmers will be helped to increase their yields by as much as 50%.

Under this program, new seed and grain storage facilities will be built at the local level. The facilities can be used by farmer dealers to store seed, thereby increasing seed availability, and by farmers to store grain in anticipation of better market prices. The improved grain storage will help to reduce losses by as much as 20%. These transformations will improve the livelihoods of smallholder farmers, transitioning their farms from subsistence to self-sustaining operations.

Seed Processing and Storage Facility Inaugurated

DuPont also opened a state-of-the-art seed processing plant and large capacity storage facility at a cost of more than USD2 million at Menagesha (near Addis Ababa) to meet the increasing demand for Pioneer seed. The plant's capabilities are designed to ensure that Pioneer

provides farmers with the highest quality seed and includes state-of-the-art seed cleaning, grading, treating, and packaging facilities. To date, DuPont has a customer base of one-half million small-scale farmers who have adopted hybrid maize technology and it plans to expand the number to 1 million farmers in the coming years.

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Inaugural ceremony of DuPont Pioneer seed plant and storage facility in Menagesha, Ethiopia

Melaku Admasu, DuPont Pioneer Ethiopia, Addis Ababa, Ethiopia; E-mail: melakadmasu@pioneer.com

Stakeholder's Seed Workshop held in UAF, Pakistan

The stakeholders' seed workshop was held at the University of Agriculture, Faisalabad (UAF), 17 April 2013. About 23 representatives from the public and private seed sectors, actively involved in seed business and research, attended the meeting. The meeting discussed preparation for the International Seed Course/Workshop planned for 26-27 September 2013; establishment of a Pakistan Seed Academy; and establishment of an ISTA accredited seed testing laboratory in UAF.

The meeting discussed the present technical problems of the seed sector, such as seed storage, cotton seed germination, and vegetable seed production; suggesting that these topics be covered in the course. The course primarily focuses on seed production, seed longevity, seed storage, and seed testing, and the meeting identified four national and 10 international resource persons. A committee was constituted to raise funds and the registration fee fixed at PKR5000. A sponsorship contribution of PKR1 million would provide a waiver of the registration fees for five employees.

The participants also discussed establishment of a Pakistan Seed Academy. The main objective of the academy would be to strengthen the link between the public sector institutions, national and multinational seed companies, international organizations, and individuals to cooperate in the development of national seed industry. The main responsibilities of the academy will be to provide a platform for the seed stakeholders to discuss and decide issues related to the seed industry, training programs, seminars, collaborative research and fellowships, and awards for excellence in seed research and business. The academy will be part of the Seed Association of Pakistan (SAP). A seven-member committee was formed under the Chairperson of the Seed Association of Pakistan. The committee was requested to present a draft proposal for a Pakistan Seed Academy at the next SAP meeting.

Participants of seed stakeholders' workshop in UAF

The meeting finally discussed the establishment of an ISTA accredited seed testing laboratory in UAF. The laboratory is expected to provide seed testing services to the private seed sector to expedite timely seed delivery. This activity was sponsored by the Endowment Fund Secretariat (EFS), UAF.

Irfan Afzal, Crop Physiology Department, UAF, Faisalabad, Pakistan: E-mail: irfanuaf@gmail.com

Varietal Releases for Cereals and Legumes

New Wheat Varieties for Irrigated Lowland Areas of Ethiopia

In Ethiopia, wheat is produced extensively under rainfed conditions with a national average yield of up to 2 t/ha. In 2006, more focused research on irrigated wheat was re-started at Werer Agricultural Research Center (WARC) under the Ethiopian Institute of Agricultural

Research (EIAR). Wheat could be one of the potential cereal crops for irrigated areas that best fits as a rotation crop after cotton during the cool season in Afar and Somali Regional States, eastern Ethiopia.

WARC had received promising lines from ICARDA through the CWANA Low Latitude 5th Irrigated Areas Spring Bread Wheat Yield Trial and tested them at Werer and Gewane in Afar Regional State for two crop seasons from 2010/11 to 2012/13.

The National Variety Release Committee (NVRC), during its annual deliberation on 23 May 2013, released two bread wheat varieties, Adel 6 and Nejma-14 (Table 1). These varieties have high yield potential, heat tolerance, and moderate tolerance to salinity. They are recommended for the irrigated lowland areas of Afambo, Amibera, Awash-Fentale, Asaita, Dubti, and Gewane in Afar Region, and similar areas.

EIAR is building on its experience of accelerated seed multiplication to make these varieties available to farmers in lowland irrigated areas within the shortest possible time through its scaling-out program.

On-farm variety verification trials of two bread wheat varieties by Werer Agricultural Research Center in 2012/13

Table 1. Bread wheat varieties released for irrigated areas in lowlands of Eastern Ethiopia in 2013

Description	**Origin and agronomic performance**	
Varieties	Adel-6	Nejmah-14
Origin	ICARDA	CIMMYT/ICARDA
Cross/pedigree	SAMAR-13/PASTOR-1	SKAUZ/BAV92/3/CROC-1/AE SQUARROSA (224)//OPATA
Selection history	ICW97-0545-1AP-0APS-0AP-9AP-4AP-6AP-0AP	CMSS97M02919T-040Y-0B-0AP-3AP-0APS-0AP-4AP-1AP-3AP-0AP
Heading (day)	50	53
Maturity (day)	82	82
Plant height (cm)	65	75
1000kernel weigh (g)	34	32
Spike length (cm)	6	7
Yield (t/ha)	2.93	2.98

For more information please contact: Desta Gebre, Werer Agricultural Research Center, Werer, Ethiopia; E-mail: destabanje89@gmail.com

New Lentil Variety Released for Northern India

A new lentil variety with the potential to boost yields and raise farmers' incomes was released for the northern hills of India. The VL-516 variety, jointly developed by ICARDA and the Vivekananda Institute of Hill Agriculture (VKPAS) in Almora, Uttarakhand, will help to improve farm incomes and strengthen household nutritional security by increasing

yields by as much as 21% over previously released cultivars.

VL-516 is a bold-seeded lentil variety developed from ICARDA-supplied genetic materials and is suitable for rainfed cultivation. Over the years, yield data from numerous locations has showed that the variety consistently out yielded all existing cultivars. VL-516 is also moderately resistant against wilt and rust diseases and has been trialed in a geographically diverse Indian testing program.

A new lentil variety under seed multiplication

For more information, please contact: Dr Shiv Kumar Agrawal, ICARDA, Rabat, Morocco; E-mail: s.agrawal@cgiar.org

Pakistan Releases Bread Wheat Varieties

In Pakistan, wheat is a major crop grown throughout the country on close to 9 million ha. In 2010-11, Pakistan ranked seventh and fifth, respectively in terms of wheat area (8.81 million ha) and grain production (25 million tonnes) in the world. However, average wheat productivity remains low at about 2.5 t/ha.

The National Agricultural Research Center coordinates research on wheat, including the National Uniform Wheat Yield Trials (NUWYTs), at the federal level. Annually, the federal and provincial agricultural research institutes submit promising lines for testing for agronomic performance to the NARC and for variety registration (DUS) to the Federal Seed Certification and Registration Department. Both the agronomic and registration trials take a minimum of two years before final release of the variety.

The Nuclear Institute for Food and Agriculture (NIFA) in Peshawar and the Cereal Crops Research Institute (CCRI) in Nowshera reported the release of three bread wheat varieties following the 33rd Provincial Seed Council meeting, 5 March 2013 (Table 1). The two bread wheat varieties from CCRI, Shahkar CCRI 2013 and Pirsabak 2013, are resistant to wheat rusts in Pakistan and have higher yield potentials – in the range of 15 to 20% – over the standard checks. NIFA Lalma-2013 is released for rainfed areas. It tolerates high temperature and drought stress and shows a high level of resistance against stripe and leaf rusts.

A 2010 post-flood scenario in Pakistan, led to 'Seher 06' becoming a dominant variety in the province and it has now become susceptible to the prevailing rust races. A considerable effort is being made by research institutes, extension departments, and seed growers for production of seed of new high potential and disease resistant varieties in the province. Newly released high-yielding, disease resistant varieties NIFA Lalma-2013, Shahkar, and Pirsabak-2013 will further strengthen the varietal matrix which will enhance sustainable wheat production in the province.

TWS team examining the wheat field of NIFA Lalma-2013

Since 2008/09, ICARDA and CIMMYT, with financial support from USAID and USDA, have been supporting fast-track variety release and accelerated seed multiplication by the NARS in Pakistan. In 2011, three Ug99 resistant bread varieties were released by the NARS in Pakistan: BARI (Dahirabi 2011), NARC (NARC2011), and RARI (Aas 2011). It was reported that, in 2013, close to 12,000 tonne of Aas 2011 was produced by the public and private sectors – sufficient to cover about 10 to 15% of the wheat area in southern Punjab – which is a remarkable success.

Table 1. Bread wheat varieties released in Khyber Pakthunkewa (KPK) province, Pakistan

Research center	Name	Origin	Pedigree and selection history	Remarks
CCRI	Shahkar CCRI 2013 (PR-98)	CIMMYT	CMH84.3379/CMH78.578//MILAN CMSS93Y006285-7Y-010Y-010M-010Y-10M0Y-3KBY-0KBY	Irrigated areas
	Pirsabak-2013 (PR-102)	CIMMYT	CS/TH.SC//3*PVN/3/MIRLO/BUC/4/MILAN/5/TILHI CMSS97M04005T-040Y-020Y-030M-020Y-040M-28Y-3M-0Y	Irrigated areas
NIFA	NIFA Lalma 2013 (NRL0517)	CIMMYT	PASTOR/3/ALTAR 84/AEGILOPS SQUARROSA (TAUS)//OPATA CMSS97M00316S-OP20M-OP20Y-43M-0Y	Rainfed areas

For information, please contact: Abdul Bari, CCRI, Nowshera; E-mail: bari_655@yahoo.com or Abdul Jabbar, NIFA, Peshawar; E-mail: abduljabbarnifa @yahoo.com

RESEARCH NOTES

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

Establishing Community-based Small-scale Seed Production Scheme in Metekel Administrative Zone, Benishangul Gumuz Regional State, Ethiopia

by

Adane Melak, Fitsum Miruts, Selten Abadi, Sisay Kidane, Yalew Mazengiya and Zinaw Dilnesaw[1]

Abstract

In the Metkel Administrative Zone (MAZ), despite the availability of new crop technologies, the scaling-out program did not progress well for several limiting factors. The impact and benefits from crop-based technologies were limited in coverage. Pawe Agricultural Research Center (PARC) undertakes community-based seed production schemes with selected farmers and respective agricultural experts in four *woredas* of MAZ. Farmer groups were established and encouraged to engage in local seed production. Each group elected its own chairperson for effective communication between researchers, *woreda* experts, and farmers. Farmers were trained in the principles and practices of seed production of sesame, soybean, and haricot bean. PARC staff participated in the training and supervision of the farmers and experts of the *woreda* Agriculture Office and in monitoring seed production activities. Ninety one selected farmers from the four *woredas* were provided with 3.02 quintal (1 quintal = 100 kg) of sesame seed, 6.5 quintal of soybean seed, and 15 quintal of haricot bean seed. About 228, 210 and 225 quintals, respectively of sesame soybean, and haricot bean seed were produced in the target *woredas*. Community-based seed production activities were successful, but there were marketing problems with the seed produced. Farmers had access to quality seed of soybean, sesame, and haricot bean from their neighbors; increasing the number of farmers with access to quality seed in the target districts.

1. Introduction

Pawe Agricultural Research Center (PARC) is one of research centers of the Ethiopian Institute of Agricultural Research (EIAR). It is based in Benishangul Gumuz Regional State and is involved in crop improvement, including cereals (maize, sorghum, millet, and rice), legumes (haricot bean), and oil crops (sesame and soybean).

PARC developed several high-yielding and disease resistant sesame, haricot bean, soybean, groundnut, rice, finger millet, sorghum and maize varieties together with their associated improved agronomic practices. Farmers in MAZ, compared to those in other parts of the country, do not have adequate access to certified seed because neither the public seed enterprises nor the private seed companies have units operating in the region. The remoteness of the area and its poor infrastructure make it difficult

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to get seed from nearby regional seed enterprises.

PARC has made a tremendous effort to provide quality seed to meet the demand of the region, but the center could not produce enough seed for all farmers given its limited capacity.

A technology scaling up/out initiative by the EIAR demonstrated that how proven technologies could boost agricultural production at the farm and country levels if implemented with all the recommended agronomic packages. PARC initiated the technology transfer activities through pre-extension demonstration, popularization, and technology scaling out to increase agricultural production and improve the livelihoods of farming communities. Constraints to the availability of and access to quality seed called for strengthening the local seed system through community-based seed production schemes to reach small-scale farmers.

2. Location

Metekel is one of the three administrative zones in the Benishangul Gumuz Regional State, Ethiopia. MAZ has seven *woredas* – Dangur, Guba, Womera, Mandura, Dibate, Bullen, and Pawe. It is lowland with a high rainfall and hot temperatures. Its diverse agro-ecology provides potential for cultivation of different crops. However, the absence of organized technology transfer limits agricultural production in the region.

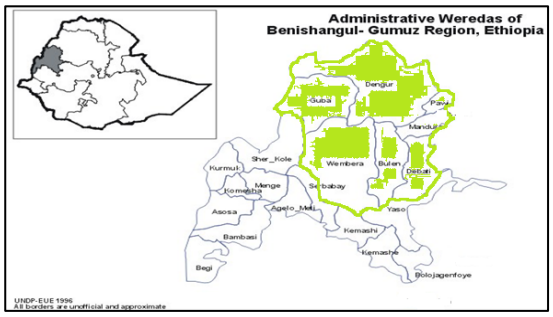

Figure 1. Metkel Administrative zone of Benishangul Gumuz regional state

In MAZ, farmers practice a mixed crop-livestock production system. A number of important food crops, such as maize and sorghum, and other commercial crops such as groundnut, sesame, and other oil crops, are produced. Farmers practice shifting cultivation by slashing and burning the natural vegetation. Planting is done by broadcasting the seed and covered using ox-drawn ploughs for cultivation (Fistum et al., 2006). The area also has a potential for livestock and is rich in natural resources, but this potential is underutilized. In areas bordering Sudan, there are semi-pastoralists rearing cattle with individuals owning up to 200 or more head.

3. Establishing community seed production

In the absence of governmental and/or non-governmental organizations engaged in seed supply in the region, PARC initiated a community-based seed production scheme. The primary purposes of the community-based seed production scheme were to meet the demand of the farming communities for quality seed, to enhance crop productivity and production, to improve the livelihoods of farmers; and to facilitate scaling up/out of new agricultural technologies in the region.

PARC, in collaboration with the district agricultural bureau, identified, selected, and organized exemplary farmers with good experience who would be willing to participate in community-based seed production in the target *woredas*. In total, 91 farmers were selected in four districts. These farmers were formed into groups and engaged in seed production. Each group elected its own chairperson for effective communication between researchers, *woreda* experts, and farmers. Farmers and development agents were trained to strengthen their technical capacities in the principles and practices of sesame, soybean, and haricot bean seed production. PARC researchers participated in the training and provided advice to farmers and the *woredas'* Agriculture Offices.

PARC researchers and the respective extension staff participated in and supervised all activities, from site selection, land preparation, and planting to harvesting and such post-harvest handling as seed cleaning and storage. *Woreda* development agents were given overall responsibility for following up on the field activities during seed multiplication. A multi-disciplinary team of researchers and subject matter specialists paid regular visits to the farmers to monitor and evaluate their progress. They also assisted in seed marketing opportunities for the seed producers. PARC has shown exemplary achievement in Benishangul Gumuz Region.

4. Achievements

A successful implementation of a scaling-out program requires the seed of new crop varieties

to be available and to reach farming communities. During previous scaling-out years, farmers obtained seed of new crop varieties from different sources, including PARC. However, the center could not provide enough seed for all farmers. As a result, farmers were obliged to purchase seed through local channels which offered the seed of fewer varieties. Informal seed sources may have their own limitations particularly regarding seed quality.

In 2009/10, the community-based seed production scheme for sesame, soybean, and haricot bean was initiated in four *woredas* inMAZ – Dangure, Debate, Mandura, and Pawe. Selected farmers from the four *woredas* were provided with 3.02 quintal of sesame, 6.5 quintal of soybean, and 15 quintal of haricot bean.

A total of 228 quintal of sesame, 210 quintal of soybean, and 225 quintal of haricot bean seed were produced in the different *woredas* in the 2009/10 crop season (Table 1). The amount of seed produced was sufficient to cover the requirement for the 2010/11 technology scaling-out activities and complement the quality seed produced and distributed by PARC. The number of farmers who gained access to quality seed and participated in the scaling-out activities is presented in Table 2.

Table 1: Amount of seed produced under community-based seed production scheme in2009/10 crop season

Woreda	**Crop**	**Variety**	**Quantity of seed distributed (quintal)**	**Number of farmers participating**	**Quantity of seed produced (quintal)**
Pawe	Sesame	Abasena	1.4	20	66
	Soybean	Blessa95	6	10	200
Sub-total				**30**	**266**
Dangur	Sesame	Abasena	0.76	19	70
	Soybean	Blessa95	0.5	1	10
Sub-total				**20**	**80**
Mandura	Sesame	Abasena	1.4	20	140
Debate	Sesame	Abasena	0.48	6	42
	Haricot bean	Awashmelka	15	15	225
Sub-total			**15.48**	**21**	**267**
Total				**91**	**753**

Source: Pawe Agricultural Research Center Socioeconomic Research, Extension, and Farmer Linkage Group (PARC-SEREFLG), PARC

Table 2. Number of farmers accessing quality seed under the community-based seed production scheme in the 2010/11 crop season

Woreda	**Crop**	**Variety**	**Amount of seed distributed (quintal)**	**Number of farmers accessed quality seed**
Pawe	Sesame	Abasena	66	1,100
	Soybean	Blessa95	200	500
Sub-total				**1,600**
Dangur	Sesame	Abasena	70	1,166
	Soybean	Blessa95	10	25
Sub-total				**1,191**
Mandura	Sesame	Abasena	140	2,333
Debate	Sesame	Abasena	42	700
	Haricot bean	Awashmelka	225	450
Sub-total				**1,150**
Total			**753**	**6,274**

Source: PARC-SEREFLG

The community-based seed production scheme was started in one district (Debate) with just 18 farmers and one technology in 1997. In 2010, it had reached more than 35,216 farmers in seven w*oredas* (Bullen, Dangur, Debate, Guba, Mandura, Pawe, and Wombera) and included alternative crop, livestock, and natural resource management technologies. Several proven

technologies have been demonstrated; and have created awareness and provided better opportunities for access to and use of the technologies by surrounding farmers.

Farmer seed producers cleaning (image 1) and packaging (image 2) seed for distribution

The main benefits of a community-based seed production scheme include, but are not limited to, the following:

- Increases in household incomes (up to ETB2000/quintal for sesame)
- Gains in basic knowledge about quality seed production
- Increases in agricultural production and productivity
- Experience working with groups of farmers and stakeholders
- Scaling-out of proven technologies

Several proven technologies were scaled out reaching many farming communities participating in the scaling up/out in the project intervention area (6274 farmers). Consequently, farmers achieved higher harvests and better incomes, thus improving their livelihoods.

5. Conclusion

Community-based seed production was successful other than for the problems encountered in seed marketing. Some farmers sold the seed produced to the market as grain earlier in the season. In general, farmers had easy access to quality seed of soybean, sesame, and haricot bean from their neighbors. The project also strengthened the scaling up/out activities by providing quality seed in the various *woredas* where the seed was produced.

It is recommended that farmer-based seed production be organized in each *woreda* to improve the seed supply system. The seed marketing system also should be developed to help make seed production sustainable and complement the formal seed sector.

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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 Plant Breeding Congress, 10-14 November 2013, Antalya, Turkey

The congress will be organized by the Plant Breeders Sub-Union of Turkey (BISAB) together with the Turkish Plant Breeders Association (TUBID), Turkish Seed Union (TURKTOB), ECO Seed Association (ECOSA), and other national and international organizations. The congress will be organized under three different sections, such as field crops, horticultural crops, and genetic resources. It is intended that the subjects should be kept broad in order to provide opportunities to the scientific community to present its work orally or as poster presentations that can be of value for plant breeding. The congress will cover conventional breeding, molecular genetics and biotechnology, genetic engineering and genomics and genetic resources for pre-breeding

Abstract submissions will end on 20 September 2013. Submissions can be made to the Organizing Committee Secretariat by e-mail. Corresponding authors should indicate whether they want to present the paper orally or as a poster. Full papers, selected from among the oral presentations by the Scientific Committee will be published in the Journal of Crop Breeding and Genetics after the congress.

For more information, please contact the Organizing Committee at: e-mail: ipbc2013@gmail.com. Further information and registration form is on the website.

APSA Seed Congress 2013

The APSA Seed Congress 2013 will be held 18-22 November 2013 in Kobe, Japan. For more information, on registration, please contact: APSA Secretariat at apasa@apsa.org or visit http://apsaseed.org/apsa_2013/

AFSTA Congress 2014

The AFSTA Congress 2014 will be held 4-7 March 2014 in Tunis, Tunisia. For more information, kindly contact AFSTA Secretariat at afsta@afsta.org or Tel: +254 20 2727853

2014 ISF World Seed Congress

The 2014 ISF World Seed Congress will take place 26-28 May 2014 in Beijing, China. For more information, visit: www.worldseed2014.com

Courses

Distance Learning Course DL-205

On-line registration for the UPOV distance learning course 'Introduction to the UPOV System of Plant Variety Protection under the UPOV Convention' is now open. The timetable for the session is as follows:

- Study period: 11 November to 15 December 2013
- Final exam: 9-15 December 2013

On-line registration is available from 1 August to 31 September 2013. For Category 1 and 2 participants, all endorsements must be provided by 15 October 2013. The categories of participants are as follows:

- *Category 1:* Government officials of UPOV member states endorsed by the relevant representative to the UPOV Council (*No fee)*
- *Category 2:* Officials of observer states or inter-governmental organizations endorsed by the relevant representative to the UPOV Council *(one non-fee paying student/state or inter-governmental organization; additional students: CHF1000/student)*
- *Category 3:* Others (*Fee: CHF1000)*

Detailed information on the course content and on-line registration is available at: http://www.upov.int/resource/en/dl205_training.html.

Distance Education in Plant Breeding at Texas A&M University

This program is an extension of the existing plant breeding programs offered by the Department of Soil and Crop Sciences and the Department of Horticultural Science at Texas A&M University. It offers MS (non-thesis or thesis options) and PhD degrees in Plant Breeding by distance education to students unable to study on-campus in a traditional setting. This program is for individuals employed in private industry, government agencies, non-government organizations, and other agriculture professionals who need and desire additional knowledge and training in plant breeding, but cannot relocate to a university campus. Distance education students will take advantage of the same curriculum available to on-campus students with identical course content and professors. These unique programs are designed to deliver high-quality plant breeding education to students across the globe. No campus visit is required. For information,

contact LeAnn Hague, Distance Education Coordinator, Department of Soil and Crop Sciences; E-mail:leann.hague@tamu.edu.
Source: Texas A&M Plant Breeding Bulletin May 2013

Continuing Education in Plant Breeding at Texas A&M University

The College of Agriculture and Life Sciences at Texas A&M will deliver continuing education courses in plant breeding and genetics to clientele interested in gaining new information on plant breeding or simply seeking refresher courses. This program is designed for individuals employed in private industry, government agencies, non-government organizations, and other agriculture professionals who need and desire additional knowledge and training in plant breeding, but who are not interested in an additional academic degree. A professional certificate can be a part of this program.

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

Brown, L.R. 2012. Full Planet, Empty Plates: The New Geopolitics of Food Security

W.W. Norton; ISBN 978 0 393 34415 8; 144pp; Price: £10.99; Website: www.wwnorton.co.uk

World agriculture is now facing challenges unlike anything before. The carryover stocks of world grain have dropped from the average of 107 days of consumption of a decade ago, to 74 days in recent years. World food prices have more than doubled.

Soil, water, and amenable temperatures are the keys to plant growth, but erosion, emptying aquifers, drying rivers, erratic or failed rains, and rising temperatures clearly prejudice sustaining yields, let alone increasing them. Even in the established global granaries – USA, Australia, Argentina, and Russia – yields have suffered from drought and there appears to be no corrective strategies beyond restriction of exports and acquisition of land overseas to meet domestic needs. The land bought or leased is almost invariably in countries already struggling to achieve food security, with some dependent on food aid.

Demand for grain has doubled in the past decade, both to feed the 219,000 extra mouths that join the global family every day and to feed the livestock and poultry that are needed to satisfy the demand of some 3 billion consumers who are 'moving up the food chain'. With water for irrigation increasingly scarce, and with huge areas subject to drought and erosion, China must look abroad. Other Asian countries are following the same trend. South Korea, Malaysia, and India have all acquired land abroad, as have Saudi Arabia, Egypt, Libya, UAE, and other Gulf States. Meanwhile the European Union's renewable energy law, requiring 10% of its transport energy to come from renewable sources by 2020, is encouraging firms to invest in land to produce biofuels. One-third of US maize (corn) already goes to distil ethanol.

Ferris, S. M. Paschall, D. Seville, L. Dadi and G. Kumssa2012. Dried beans in Ethiopia: increasing food security through trade

IIED, ISBN 978-1-84369-862-3; 38pp, Website: http://pubs.iied.org; free to download

Millions of farmers in Africa depend on export markets for their livelihoods. Although small-scale farmers often have the skills and soils to provide high-quality products for the food industry; their entry into these markets is constrained by increasingly stringent standards, volatile prices, and lack of credit. Over four years, the New Business Models for Sustainable Trading Relationships project investigated how supply chains can be adapted to include and benefit small-scale producers.

This paper is one of four that reveal ways to break down the barriers which usually prevent African farmers from reaching lucrative markets in the West. *Dried beans in Ethiopia* focuses on efforts to link white pea bean farmers in Ethiopia to canning factories and retailers in the UK, while improving their productivity and product quality. Through the project, farmers learned more about their business partners and gained a better

understanding of final market requirements, while traders and processors were made more aware of the production constraints facing producers and the kind of information that they needed.

Websites

Agricultural Genomics Network of CGIAR Generation Challenge Program (GCP)

As part of GCP's community-building efforts, and implemented through the Integrated Breeding Platform (IBP; https://www.integratedbreeding.net), GCP's Theme 1 (Comparative and Applied Genomics) has established the Agricultural Genomics Network (AGN; https://www.integratedbreeding.net/agricultural-genomics).

AGN's principal objectives are:

1. To develop a community to discuss advances in genomics and provide a critical appraisal of genomic technologies, tools, and approaches
2. To develop a portal which will present the information on tools, resources developed by GCP, or available in the public domain either by hosting some of them or by providing links to other existing databases and portals
3. To broker access to economically priced large-scale sequencing, construction of a variety of (BAC, cDNA, and fosmid) libraries, physical mapping, sequencing and re-sequencing, etc., provided by third-party service providers.

The forum offers interactions, discussions, activity planning, and a forum for the exchange of ideas of the genomics and breeding communities in developing and using modern genomic technologies, tools, and approaches in breeding.

For more information, please contact: Rajeev Varshney (r.k.varshney@cgiar.org), or Manish Roorkiwal (m.roorkiwal@cgiar.org)

Newsletters

Asian Seed and Planting Material

The Asian Seed and Planting Material, published by the Asia and Pacific Seed Association, contains very useful information on seed, research and development, production, processing, marketing, IPR and phytosanitary issues, etc. It also includes relevant statistics on the international seed industry. It discusses interesting issues and news updates about the seed markets in the Asia and Pacific regions. The magazine is published bi-monthly with over 4000 pass-on readerships and is distributed in 65 countries. If you are interested in subscribing to or advertising in the newsletter please write to Asia and Pacific Seed Association (APSA), P.O. Box 1030 Kasetsart Post Office, Bangkok, Thailand.

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 brought by subscribers. The Editor always welcomes suggestions on format and content, sent by e-mail to z.bishaw@cgiar.org