SEED INFO

Official Newsletter of the WANA Seed Network

Seed Info No. 34 January 2008

Published by WANA Seed Network Secretariat, Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria;
Tel: +963-21-2213433/2213477; Fax: +963-21-2213490/2219380; E-mail: icarda@cgiar.org;
Website: www.icarda.org

EDITORIAL NOTE

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

For most of the history of agriculture, farmers were engaged in domestication of crops. This was a slow process but over many generations of conscious and unconscious selection, it led to significant modification of many of our crop plants from their wild ancestors. The process of domesticating crops will continue as we are looking for new products and economic opportunities in a changing global agriculture and markets.

In the **NEWS AND VIEWS** section, Bert van Duijn and Henrie Korthout from Fytagoras BV, present new crops targeting market opportunities in the horticulture sector in the Netherlands. For example, horticulture growers wish to produce new, higher-value crops for new (or existing) markets. These new crops may be functional foods targeted to specific target groups such as obesity or hyperactive children with learning problems. There is also news from Iowa State University, the International Seed Federation, and on Turkey's accession to the Union for the Protection of New Plant Varieties (UPOV) convention.

The section on **SEED PROGRAMS** includes news from Afghanistan, Ethiopia, Iraq and Pakistan. The news from Afghanistan focuses on a seed fair organized by the FAO Seed Project in Herat and an Agricultural Fair organized by Development Alternative Inc. in Jalalabad. From Ethiopia, we describe the just-concluded Tailor Made Training Program implemented by the Ethiopian Seed Enterprise, Wageningen International and ICARDA to strengthen farmer-based seed production. From Iraq we report on the ongoing capacity building efforts for the rehabilitation and development of the national seed industry. From Pakistan, we report on the performance of the public and private seed sectors based on recent statistics released by the Federal Seed Certification and Registration Department.

The **RESEARCH** section aims to capture information on adaptive research or issues relevant to seed program development in the region and beyond. Asrat Asfaw from the Southern Agricultural Research Institute writes about seed relief intervention and the resilience of local seed system under stress in southern Ethiopia.

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

Happy New Year

Zewdie Bishaw
Editor

WANA SEED NETWORK NEWS

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

Second International Seed Trade Conference

The Second International Seed Trade Conference (ISTC2007) in CWANA Region was held from 19-21 November 2007 in Giza, Egypt. It was organized by the Egyptian Seed Association, in collaboration with ICARDA's Seed Unit and the Turkish Seed Industry Association. The conference aimed at bringing together the private and public sectors within and outside CWANA to stimulate regional contacts and encourage seed trade.

Conference objectives

The focus of the conference was on seed trade, but the program also included presentations on policy, regulatory, institutional and technical issues affecting seed industry development at global, regional and national levels.

Participants

The conference attracted participants from around the world, representing private and public seed companies, private agricultural input suppliers, agricultural and seed equipment manufacturers, international, regional and national seed trade associations, and international and regional research and development organizations working on seeds (FAO, ICARDA, ISF, ISTA, OECD, UPOV). About 294 participants from over 24 countries attended,

making it one of the successful seed trade congresses in the region.

Trade exhibitions

Promoting contacts and seed trade were key elements of ISTC2007. The objective was successfully achieved with a high turnout of private seed companies who organized trade exhibitions. There were stands by private and public seed companies, manufacturers of seed equipment, and input supply companies.

Technical presentation

Presentations were made on policy, regulatory, institutional and technical issues affecting the seed industry: (i) Status and prospects for global and regional seed trade; (ii) Intellectual property rights; (iii) GMOs and biosafety in seed trade; (iv) Biofuels and impacts on seed and grain trade; and (v) Status and role of the private seed sector in WANA.

Panel discussions were also held on accreditation in seed quality assurance; harmonization of seed regulatory frameworks; and formation of a regional seed trade association. The presentations drew on examples from the region and elsewhere, and generated interesting discussions and exchange of views.

Role of the private sector in CWANA

Policy and regulatory reforms in the seed sector led to the emergence of a vibrant private seed sector in countries such as Egypt, Morocco, Pakistan and Turkey; and the establishment of national seed trade associations representing the private sector. It is important to sustain such efforts by national governments for more private sector participation to capture the opportunity offered by the commercial seed market in the region.

Achievements and future implications

The success of the First and Second International Seed Trade Conferences is already bearing fruit and generating interest among seed trade associations in the region. Plans are already underway for the Central Asia and Caucasus Seed Trade Conference, scheduled for 2008 in Bishkek, Kyrgyzstan.

Ms Sherwet Ahmed, ESAS, 35, Gamet El Dowal El Arabia Street, Mohandessen, Cairo, Egypt; E-mail: info@esas-egypt.org; and Zewdie Bishaw, Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria; E-mail: z.bishaw@cgiar.org

ISTC2007 in Pictures

Opening session

Seed trade exhibition

Technical presentations

Panel discussion

Closing ceremony

NEWS AND VIEWS

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

New Crops for New Markets in Horticulture

In the Netherlands, greenhouse technology and improved crop production techniques are driving new developments and ever improving quality. This makes horticultural production very efficient, with extremely high yields and high quality products. Producers control growth conditions in the greenhouse to optimize for every parameter including varying electricity and fuel costs, which are calculated with computer models. Robots are now doing much of the work in greenhouses. The use of crop protection chemicals is minimal due to use of resistant varieties, high levels of hygiene, and integrated pest management strategies.

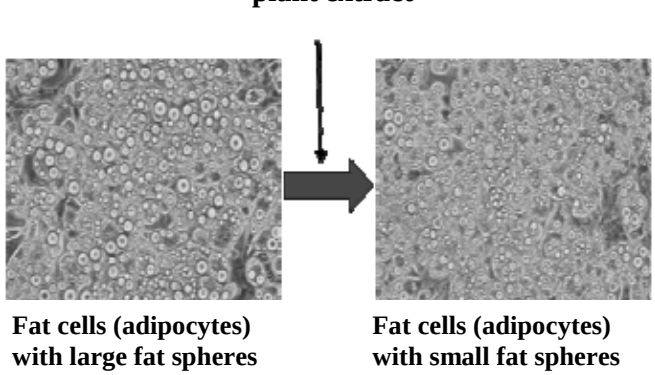
Despite all the good news for horticulture production in the Netherlands, growers are looking very hard for further improvements, better profits, and economically more secure markets. Competition with many similar products from other countries is high, mainly because of very expensive labor and land. The climatic conditions are also not always ideal for different crops; heating and lighting are needed to produce all year round.

New crops for new markets

Horticulture growers wish to produce new, higher-value crops for new (or existing) markets. These new crops may be functional foods targeted to specific groups – for example a fruit or vegetable specifically for people with obesity problems. They may also be crops grown for production of specific chemical compounds for food ingredients or substrates for the chemical or pharmaceutical industry. To further increase the added value of horticultural crops in the Netherlands there is an interest in improving the properties of existing crops by introducing new features for specific markets. Traditional knowledge that is archived in extended Asian databases (like TCM, Prosea, Ayurveda) provides an excellent base for selecting alternative crops.

Value addition

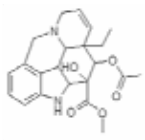
Fytagoras is a research company involved in initiatives for the creation of new crops for new markets in the Netherlands. A wide range of research tools and approaches are necessary for selection, functional testing, optimal growing and many other aspects. This can be illustrated in a project supported by the Dutch government in cooperation with growers, Leiden University and Indonesian institutes. The aim of the project is to produce a new crop that helps to reduce obesity, which is a common problem today. The approach is to test different crops that may be suitable, based on knowledge of traditional use, growing properties, taste properties, etc in specific molecular and cellular assays that predict a specific action in satiety sensation and fat degradation in humans. The plants are tested for binding to specific human receptors in cells. The potential of fat degradation is measured in cells that are subjected to the compounds present in different plants. From these tests only a few candidate crops remain. From these crops a total chemical profile is made. This profile is matched to the action in the bio-assays for obesity. These can be linked to specific chemical compounds and compound profiles to the obesity reducing effects. Once this stage is reached the crop is actively breed for optimizing the chemical profile of the plant to be sold as a product that helps to fight obesity. In addition, the fully controlled environment in the greenhouse allow for designing conditions to specifically enhance the necessary chemical profile of the new crop. Finally, with good market promotion, growers can produce a crop with much higher added value.



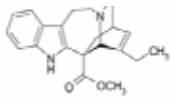
Diagrammatic illustration of the effect of specific plant extract on breakdown of fat (light spheres in the cells) in fat cells

In addition to obesity, we also aimed at crops that modulate the immune system (increased resistance against diseases); crops that

affect diabetes; and crops that can be used for the extraction of valuable chemical compounds for the pharmaceutical and chemical industries. One of the examples we are working on is the production of very high levels of compounds like vindoline and catherantine (both precursor molecules for anti-tumor drugs) from *Catharanthus roseus* in greenhouses in the Netherlands.



Vindoline



Cathranthine

Production of Catharanthus roseus for the pharmaceutical industry

Production of such crops requires strictly controlled conditions. Therefore, Fytagoras aims to develop and apply the newest sensor technology for climate control and non-invasive monitoring of bioactive compounds.

Bert van Duijn and Henrie Korthout, Fytagoras BV, Plant Science, Zernikedreef 9, P.O. Box 2215, 2301 CE Leiden, The Netherlands. E-mail: bert.vanduijn@fytagoras.nl; http://www.fytagoras.nl

❋❋❋

Iowa State University Offers Postgraduate Degree in Seed Technology and Business

In a recent Asia Pacific Seed Association (APSA) Congress in Manila, the Philippines, Prof. Murray Hill from Lincoln University, New Zealand, reviewed the gloomy picture for training tomorrow's seed technologists. With donor support for national seed programs dwindling, and a more privatized seed industry emerging, public sector funding for training in seed science and technology is becoming a thing of the yester years.

However, there is a glimmer of hope for tomorrow's seed technologists. Iowa State University began a new graduate program offering a master's degree in seed technology and business. The interdisciplinary degree is a cooperative effort between the colleges of Business and Agriculture and Life Sciences. It combines business courses similar to those in the first year of an MBA program with classes on scientific and technical subjects in seed and crop improvement. The program, integrating technical and business subjects into a single graduate program for seed, is unique.

The program has attracted 23 students from the USA and four other continents, and from a variety of seed organizations. The students are attracted to the program partly because courses are offered through the internet and paced so that they can continue to work at their regular jobs. Employers have sponsored many of the students.

Students participating in the master's program are required to complete 36 credits of coursework, including three credits for the creative component. Two graduate certificates, one in seed science and technology and one in seed business management are being offered as part of the program. For more information contact: Paul Christensen, Program Manager at e-mail: intlcorn@iastate.edu; Website: www.seeds.iastate.edu/class/.

❋❋❋

Turkey Accedes to UPOV Convention

Turkey became the sixty-sixth member of the International Union for the Protection of New Varieties of Plants (UPOV) on 18 November 2007. This brings the number of UPOV member countries from Central and West Asia and North Africa region to seven including Azerbaijan, Jordan, Kyrgyzstan, Morocco, Tunisia and Uzbekistan. The UPOV Convention aims to encourage the development of new varieties of plants by granting breeders an intellectual property right based on a set of clearly defined principles. To be eligible for protection, varieties need to satisfy certain conditions, such as being distinct from existing, commonly known varieties and sufficiently uniform and stable.

UPOV is an intergovernmental organization based in Geneva. For further information please contact: UPOV Secretariat, Tel: +41-22-3389155; Fax: +41-22-7330336; E-mail: upov.mail@upov.int; website: www.upov.int.

❋❋❋

Marcel Bruins Named Secretary General of International Seed Federation

In 2007, Marcel Bruins will succeed Bernard Le Buanec as the new Secretary General of the International Seed Federation. He assumed office on 1 January 2008. Dr Bruins completed his studies in plant breeding and plant pathology at the University of Wageningen in the Netherlands in 1989. He was awarded a PhD in 1998, studying Fusarium resistance in wheat at Plant Research International, the Netherlands.

After graduation, he was responsible for the patent portfolio of a large research institute and then worked in Rotterdam at the Innovation Center for Inventions, where he was active in the commercial aspects of agricultural and biotechnology inventions. In 1998, he joined the breeding company Seminis Vegetable Seeds, where he was a manager for plant variety protection but also worked on intellectual property, like patents and trademarks.

He is a member and former chair of several international committees in the Dutch Seed Association, European Seed Association and International Seed Federation.

Crop Variety Releases in 2007

ICARDA provides 'International Nurseries' based on targeted request from NARS partners and the private sector. The breeding lines undergo extensive field-testing and evaluation before final release for commercialization through the national variety release system (see table).

Canada

A kabuli chickpea line (FLIP 97-133C) was released in Canada as 'CDC Luna.' The variety has tolerance to cold and is moderately tolerant to Ascochyta blight disease. The Crop Development Center (CDC) of the University of Saskatchewan released the variety after conducting field trials, which were highly successful.
Source: The Week at ICARDA, No 990/991, October 2007

Kazakhstan
The State Variety Testing Commission (SVTC) of Kazakhstan has released one variety each of winter facultative wheat and barley after several years of testing. Barley is the second most important crop after wheat in Kazakhstan although the area declined from 7 million ha during the former Soviet Union to about 1.75 million ha in recent years.
Source: CAC News, October December 2007

Tajikistan

Tajikistan released two bread wheat varieties for commercial seed production and marketing after extensive testing by the State Variety Testing Commission. The two varieties, Alex and Norman, have shown good results in terms of yield and tolerance to stresses during variety evaluation and testing.
Source: CAC News, January-March 2007

Uzbekistan

The State Varietal Testing Commission (SVTC) has released two chickpea varieties, Zumrad (FLIP-98-210C) and Djahangir (FLIP-88-85C) and two lentil varieties, Oltin Don (ILL-7513) and Dormon (FLIP-97-4L). In three years of evaluation, these varieties have consistently out yielded the local checks by 18-25%. They also have better disease resistance and larger, cream-colored seeds which fetch higher prices.
Source: The Week at ICARDA, No 1001, 18 December 2007

Variety releases from ICARDA supplied germplasm in 2007

Crop	Country	Variety
Winter facultative wheat	Kazakhstan	Egemen
	Tajikistan	Alex, Norman
Spring bread wheat	Syria	Bouhoth 8, Joulau 2
Barley	Kazakhstan	Zhibek Zohly (IBCB-WT-99)
Chickpea	Canada	CDC Luna
	Uzbekistan	Zumrad (FLIP-98-210C), Djahangir (FLIP-99-85C)
Lentil	Syria	Ibla 1
	Uzbekistan	Oltin Don (ILL-7513), Dormon (FLIP-97-4L)

Source: ICARDA, 2007

CONTRIBUTIONS FROM SEED PROGRAMS AND PROJECTS

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

First National Seed Fair Held in Afghanistan

Farmers, seed companies, NGOs, seed and agrochemical dealers, research institutes, donors, senior officials of the Ministry of Agriculture, Irrigation and Livestock (MAIL) and other stakeholders participated in the first seed fair held from 31 August to 1 September 2007 in Herat, Afghanistan under the theme 'Diversity and knowledge for seed security'.

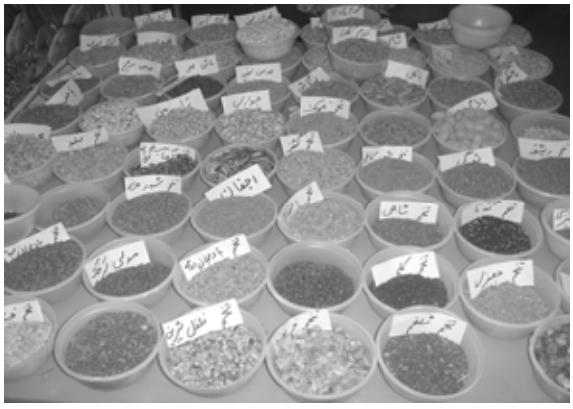
The fair was organized by the EU-funded FAO project on Variety and Seed Industry Development in collaboration with MAIL. It attracted a huge number of visitors from Herat and other parts of the country to its 141 stalls, many of which exhibited seeds and varieties of a range of crops that reflected Afghanistan's rich plant genetic diversity.

The active participation of small-scale private enterprises at the fair was an outcome of privatization/commercialization policies being pursued in the country, which aim to make the seed industry profitable, and to improve incomes and livelihoods in the rural areas.

Diversity of crops and seeds displayed at the seed fair

The exhibits were visited by high level dignitaries from FAO, Ministry of Agriculture and Irrigation, and European Commission.

Mohammad Jawad, EU Seed Project, Kabul, Afghanistan; E-mail: mohammad. awad@fao.org



❋❋❋

Village-based Seed Enterprises Win Prize for Innovation

ICARDA, with financial support through the USAID's Alternative Livelihood Program, has established 17 Village-based Seed Enterprises (VBSEs) in three provinces in Eastern Afghanistan: Kunar, Laghman and Nangarhar. In addition to providing equipment (tractors, seed cleaners) and inputs, ICARDA has trained VBSE members in production, processing and marketing seeds of staple crops like wheat, rice, mung bean and potato. During the 2006/07 season, the VBSEs produced over 900 tons of wheat seed and are multiplying seed of rice and mung bean.

H.E. Obaidullah Ramin, Minister of Agriculture (center), visits the stall of Nangarhar Seed Company

The ALP organized the Jalalabad Ag-Fair 2007 on 4-5 September 2007. The Nangarhar Seed Company, an umbrella organization representing VBSEs in Nangarhar province, and established with ICARDA support, participated. It exhibited its high-quality seed and the seed cleaner and treater provided by ALP/ICARDA. The company's stall won a 'Special Prize for Innovation' at the Ag-Fair. ICARDA's work in organizing, supporting, and transforming VBSEs into sustainable enterprises has been acclaimed by visiting dignitaries. ICARDA also exhibited its achievements in adaptive research and technology transfer through demonstrations; and in a stall set up by ICARDA-organized Mint Producers Associations.

Javed Rizvi, ICARDA, P.O. Box 1355, Central Post Office, Kabul, Afghanistan; E-mail: j.rizvi@cgiar.org

❋❋❋

International Training Program on Plant Genetic Resources and Seeds

Wageningen International, ICARDA and the Ethiopian Institute of Agricultural Research (EIAR), with financial support from the Netherlands Ministry of Agriculture and Ministry of Foreign Affairs, organized a joint 'International Training Program on Plant Genetic Resources and Seeds' (PGR and Seeds).

The training program consisted of two 2-week modules. The first module was conducted on 'Market and chain development for genetic resources and seeds', from 17-28 September. at the South Agricultural Research Institute, Awassa The second module on 'Conservation strategies and plant genetic resource policies' was held on 1-12 October 2007 at Debre Zeit Agricultural Research Center, Debre Zeit

The objective was to enhance participants' capacity to manage genetic resources and seeds; and their knowledge of policies and participatory and market-oriented approaches. The program sought to help participants and facilitators exchange experience and work together to explore practical applications for conservation and sustainable use of crop genetic resources.

The market and chain development module began with analysis of the supply chain. It created awareness of the economic value of agrobiodiversity, promoted the use of agrobiodiversity through market-oriented approaches, and ways of establishing small-scale seed enterprises involving farmers and farming communities. Other topics addressed were: economic perspectives of agrobiodiversity use; market trends and sector analysis; supply chain concepts and chain integration; small-scale seed enterprise development; and marketing under-utilized crops and locally produced seeds.

The courses also aimed to provide participants with the tools to manage germplasm collections more effectively. Special attention was given to PGR policies, intellectual property rights, and mechanisms for access and benefit sharing. Other topics addressed included: national PGR programs, genebank management procedures, international PGR policies, farmers' rights etc.

Twenty participants representing different organizations (NARS, universities, development organizations, NGOs) from nine countries (Ethiopia, Egypt, India, Italy, Malawi, Nigeria, Yemen, Uganda and Zimbabwe) attended the two modules at Awassa and Debre Zeit.

Participants of the International Training Program on Plant Genetic Resources and Seeds, Ethiopia

A multidisciplinary team of international and national resource persons and facilitators from Wageningen International, the Center for Genetic Resources (Netherlands) and ICARDA conducted the workshops.

Tailor Made Training Program Concludes with Eastern Africa Regional Workshop

In the last two issues of '*Seed Info*' we reported the launching and progress of the one-year Tailor-Made Training Program (TMTP) entitled '*The improvement of farmer based seed production scheme and revitalizing informal seed supply of local crops and varieties in Ethiopia*' by the Ethiopian Seed Enterprise, Wageningen International and ICARDA. The TMTP program concluded with an experience-sharing workshop held from15-19 October 2007 in Adama, Ethiopia.

The TMTP consisted of six training components. The first two components were implemented in October 2006 (with 27 participants from federal and regional state institutions). This was followed by development of action plans for each region, for implementing participatory seed system analysis for diagnosis and problem assessment; and designing options for small-scale seed enterprise development and support to informal seed supply. The final plan of action was developed in a planning workshop in February 2007 (third component); and elaborated at a series of four regional workshops in March and April 2007 (fourth component).

A seed policy and PGR workshop was organized in July 2007 in Addis Ababa (fifth component). The workshop addressed specific

policy and regulatory frameworks important to genetic diversity and informal seed supply. Policy options were formulated to decentralize strategies for supporting informal seed supply, contributing to farmers' practices in seed supply, supporting the establishment of community based and small-scale seed enterprises. Plans covered both improved and local varieties.

The training program concluded with the Eastern Africa Regional Workshop held during 15-19 October 2007 in Adama (sixth component). The workshop was also attended by representatives from other countries in East Africa (Ethiopia, Uganda, Tanzania, Kenya, Rwanda), West Africa (Nigeria), Middle East (Yemen), CGIAR centers, NGOs (SG 2000) and other agencies with experience in informal seed supply, and by representatives of donor agencies. There was considerable discussion and sharing of experiences from different countries.

Workshop participants (above) during classroom discussion (middle) and field visits (bottom)

During the workshop, the five regional teams (Amhara, South, Tigray and two teams from Oromia) shared the progress made in integrating the previous training components into the core programs of government agencies and NGOs. Technical, institutional and policy constraints were discussed at length. Opportunities for new regional, national and/or international projects were discussed with representatives of donor organizations. The workshop also included two field visits to locations where farmers started producing seed through the training program and the support of BoARD.

Certificate award ceremony of TMTP

The TMTP was tailored to the needs of organizations participated in the training. The knowledge gained through the training was practically implemented in the field where tangible outputs are being seen. Follow up and up-scaling activities need to be supported by both national and international stakeholders. In this regard, the Netherlands Ministry of Agriculture is interested in supporting part of the follow up activities. As an important output of this program a seed book is being prepared jointly by ESE, Wageningen and ICARDA, to be published and distributed internationally in 2008. The book will describe the experiences of the Ethiopian training and other relevant topics relating to informal seed supply in the African context.

A total of 155 participants and 25 resource persons from national and international organizations were involved in various components of the year round program. The Netherlands Organization for International Cooperation in Higher Education (NUFFIC) supported TMTP with funding.

Abdurahman Beshir, ESE, P. O. Box 2453, Addis Ababa, Ethiopia, E-mail: abdurahmanb@gmail.com

❋❋❋

Rehabilitation and Development of National Seed Industry in Iraq

FAO has been implementing a project on 'Rehabilitation and Development of the National Seed Industry in Iraq'. The objective of the project is to improve food security and nutrition through rehabilitation and improvement of the national seed program; which will promote the availability and use of quality seed and lay the foundations for a sustainable seed industry. One objective is to improve the technical capacity of national seed program staff through training. FAO and the Indian Agriculture Research Institute (IARI) have formally signed an agreement to organize three six-week training programs on 'Seed Production and Marketing', 'Seed Quality Control' and 'Variety Development and Evaluation' for 25 Iraqi staff from the Ministry of Agriculture (MoA), Baghdad. The training was conducted at IARI, New Delhi, India. It aimed to develop participants' ability to subsequently impart in-house training to Iraqi nationals involved in the seed sector.

The first training program on Seed Production and Marketing was organized for six MoA staff from 13 September to 24 October 2007. The course include various topics among others including: (i) Morphology of wheat, barley, rice and maize; (ii) Principles of cereal seed production; (iii) Causes of varietal impurities; (iv) Maintenance of varietal purity; (v) Principles and practices of hybrid seed production;, (vi) Seed processing and storage; (vii) Seed market analysis; and (viii) economics of seed production.

Field trips were arranged to different parts in India and research stations of the Indian Council for Agricultural Research. The participants also visited ICRISAT, and showed interest in forage pearl millet, which is suitable for rainfed conditions in Iraq. ICRISAT has agreed to supply suitable germplasm and lines on an experimental basis. Visits were also arranged to private seed companies and manufacturers of equipment for seed processing and seed testing.

The second training program on Seed Quality Control was conducted from 15 November to 26 December 2007 for nine participants. The objective is to develop participants' skill on: (i) Concept of seed quality control; (ii) Principles and procedure of seed certification; (iii) Seed testing; (iv) Seed sampling; (v) Seed purity; (vi) Seed moisture; (vii) Seed germination; (viii) Seed health; (ix) Other special tests; (x) Seed processing and storage; and (xi) Requirements for establishing and managing seed testing laboratory.

Participants with faculty members of IARI, India

A practical training session in the laboratory

The participants visited the University of Agricultural Science at Dharwad in Karnataka, which has the biggest seed production and quality control system in India. They also visited ISTA accredited laboratories at Bangalore and ICRISAT.

Sushil Pandey, Division of Seed Science & Technology, IARI, New Delhi, India; E-mail: sushilpandey_iari@yahoo.com and Rai Ajambar, FAO-Iraq, Amman, Jordan; E-mail: ajambar.rai@undp.org

❋❋❋

Performance of Public and Private Seed Sectors in Pakistan

According to the latest reports of the Federal Seed Certification and Registration Department (FSCRD), a total of 247,906 tons of major agricultural and horticultural crops were

distributed by the public and private sectors in Pakistan (see table below). The amount of seed supplied on average met only 16% of the national seed requirement in 2006, varying from nearly 50% for cotton to below 1% for some crops such as chickpea and groundnut.

Amount of seed distributed and demand met in Pakistan in 2006

Crop	Potential demand (t)	Quantity supplied (t)		% demand met
		Public sector	Private sector	
Wheat	1,008,840	51,773	120,010	17
Rice	39,645	2,629	9,889	32
Maize	30,888	262	8801	29
Chickpea	41,520	76	148	0.5
Pulses	7,595	97	323	5.5
Groundnut	10,580	1	0	-
Oilseeds	4,636	108	1,684	39
Potato	276,250	556	7,105	3
Vegetables	5,500	135	5,365	100
Fodders	58,129	95	9,751	17
Cotton	62,000	3,307	25,791	50
Total	1,545,583	59,039	188,867	16

Simultaneously, large volume of hybrid seed – 13,495 tons of various crops valued at Rs 2017 million (USD 1 @ 61.2 Pak Rupees) – was imported by multinational and domestic seed companies during the year 2005/06 for local distribution to farmers (see table below).

Amount of seed imported (t) and value (Rs) in 2006

Crop	Imports (t)	Value , Rs million
Maize	7443.61	1338.24
Oilseeds		
Canola	18.0	4.4
Sunflower	1636.02	358.18
Vegetables	112.01	164.93
Fodders		
Sorghum	3925.09	110.84
Millets	18.01	1.06
Total	13,495.23	2017.34

Source: The Seed News, January-June 2007

RESEARCH NOTES

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

Seed Relief Intervention and Resilience of Local Seed System under Stress: the case of Humbo *Woreda* in Southern Ethiopia

Asrat Asfaw, Anbes Tenaye and Endrias Geta[1]

Introduction

Ethiopia has received emergency food and seed relief regularly for the last three decades. The Southern Nations Nationalities and Peoples Regional State (SNNPRS) in general and Humbo *woreda* in particular repeatedly receive emergency seed relief. The chronic seed aid offers opportunities as well as challenges in stabilizing agriculture. To chart the future strategy, it is essential to understand how seed aid affects farming communities and why seed insecurity appears to persist. This paper analyzes the issues and impacts of seed aid practices.

Historical account of emergency seed relief

Seed provision during emergencies dates back many decades. For example, the US government and churches distributed seed to farmers during the Mississippi floods and depression of the 1920s and 1930s (www.redcross.org/museum). The first international seed aid delivery probably started in 1980s with rice seed in Cambodia, when an NGO, Volag World Relief, distributed 2,950 tons across the Thai-Cambodia border (http://www.websitesrcg.com/border/border-history-1.html). Since the 1990s seed relief has become a regular component of emergency efforts in Africa (Sperling and Cooper, 2003). For example, in the mid-1990s nearly USD 10 million was spent on seed procurement for emergency projects in Africa (Sperling, 2002).

In Ethiopia, free seed distribution to farmers probably started in the 1970s with the establishment of the Relief and Rehabilitation Commission (Sperling *et al*., 2007). It became a regular activity with the rehabilitation programs in the aftermath of the 1984/85 famine. In 1985, the Christian Relief and Development Association distributed 5,980 tons of seeds, sufficient to plant 255,646 ha (CRDA, 1990). The assistance mainly focused on supplying seeds and farm tools to rural households affected by stress to enhance farmers' capacity to produce their own food. The process was termed 'developmental' seed aid.

[1]Awassa Agricultural Research Center, South Agricultural Research Institute, P.O. Box 6, Awassa, Ethiopia

In SNNPRS, seed assistance to vulnerable populations probably dates back to 1984/85 when many areas of the present day regional state were affected by the famine. Since 1984/85, recurrent drought becomes common phenomena in many parts of the region making crop production more fragile and dependent on external assistance. Making available seed and agricultural tools to affected population was among the humanitarian assistance provided by many including governmental (GOs) and non-governmental organizations (NGOs).

Emergency seed relief in Humbo woreda

Provision of emergency seed relief in Humbo *woreda* probably started in 1992/93 when it was under the administration of the former North Omo Zone. The North Omo Zone implemented an ETB 2.7 million emergency seed relief project in response to a combination of flooding (due to heavy rain) and drought in different parts of the same region. ETB 400,000 was allocated for purchase and distribution of cuttings of an improved sweet potato variety, Ogan Sagan/Awassa-83. In addition, the aid program distributed seed of improved open pollinated maize varieties (A 511 and Katumani), chickpea and wheat. The project remained active until 1994/95.

In 1997, once again, the North Omo Zone was affected by bad weather caused by 'El Nino'. The Zonal Office of Agriculture obtained ETB 1.5 million for emergency seed aid. The largest share went to Humbo *woreda* to distribute sweet potato planting material and maize seed to needy farmers. The Zonal Office disbursed about ETB 64,156 to the *woreda* for seed procurement and distribution. An estimated 8 million cuttings of a local sweet potato variety were distributed to 950 drought-affected households. In addition, 56 households received 350 kg and 50 kg seed of improved and local maize varieties, respectively. Since then, seed aid become an integral part of relief interventions by GOs and NGOs, and a new source of seed for farmers in the area (Asfaw *et al*., 2007).

Seed system under stress

Farmers may obtain seeds for planting from different sources, and presumably use different channels and exchange mechanisms under normal and stress situations. Under normal situations, farmer-based seed sources, mostly own stock from the previous harvest, plays a crucial role (Longley *et al*., 2001). However, it is normal to find farming households that are seed secure, semi-secure, and insecure (always short of seed even under normal situations).

The importance of farmer-based seed sources may presumably decrease with increasing drought, insecurity and poverty. For many households, the problem of seed availability and/or access is more profound in stress situations. This is apparently because of the general seed insecurity in stress/disaster situations. Sperling and Cooper (2003) classify seed insecurity as acute and chronic. Acute seed insecurity is a distinct, short-duration event (flood, drought, civil strife, etc) that often affects a broad range of the population causing a total failure to plant, loss of harvest, or one-time loss of seed stocks in storage. Chronic seed insecurity is independent of an acute stress or disaster, and may be found among marginalized populations. It is related to economic/social (poor, little land, labor), ecological (recurrent drought, degraded land) or political (insecure areas, uncertain tenure arrangements) factors.

Many studies on seed systems under stress reveal that farmers' seed sourcing includes several social networks and actors. Farmers access and use seed from different sources and channels with varying degrees of importance depending on the context. The farmer-based seed sources include own saving, friends/relatives, other farmers within and outside the community, and local markets. These sources do not totally collapse under disaster situations (Sperling, 1997; Longley, 1997; Longley *et al*., 2001; Sperling, 2002; Haugen and Fowler 2003). Farmers can access seed for at least some key crops from local sources during a crisis (Sperling and Cooper, 2003).

Analysis of seed system under stress

In Ethiopia, despite the long history of seed aid, detailed analysis of seed system is not common within an emergency context. Generally, two kinds of crisis-related seed system analysis are practiced in the country: *priori* or *posteriori* intervention assessments. A *priori* intervention assessment is restricted to rapidly calculating the needs to provide an emergency seed relief injection. The calculations are 'best guess' estimates mostly drawn from crop loss assessment. A *posteriori* intervention assessment is usually a post-single season exercise tallying the outputs achieved from seed delivery, getting information on what happened to seeds distributed to farmers rather than asking the

fundamental question of whether the aid enhanced immediate agricultural resilience.

In 2006, a seed system assessment was conducted in Humbo, one of the vulnerable *woredas* frequently receiving seed aid. The assessment was made using focus group discussion with aid implementing agencies (GOs and NGOs) and through detailed household survey of aid recipients. Focus group discussions involved key informants from government aid practitioners at regional, zonal and *woreda* levels (B/Z/WoARD) and from NGO aid practitioners based at Humbo (World Vision, Concern Worldwide, International Medical Corps, etc). Aid recipient analysis involved 113 respondents on their experience with seed aid, description of crops and varieties used in recent seed aid events, all other seed sources used in that particular season, and overall reflection of farmers on seed aid practice and its impact on local seed systems. The analysis collected both qualitative and quantitative data using closed and open-ended questionnaires, interviews and discussion with purposively selected aid implementers and individual farmers who repeatedly received seed aid.

Views of seed aid implementers

At present, the emergency seed relief program is based on the results of crop loss assessment supplemented by nutritional surveillance. The Government (BoARD, Disaster Prevention and Preparedness Desk) and NGOs together biennially conduct a joint crop loss assessment using pre-established guidelines that involve farm questionnaires, physical observation and partly a market survey. The NGO (in this case World Vision) alone conducts the nutritional surveillance when there is food shortage or the problem is chronic. The results from the assessments help for identifying or targeting the areas and seed needy households or the beneficiaries. Household targeting is based on established criteria such as access to agricultural land (household has land but no seed), lack of assets (poor and vulnerable), etc. The committee comprising representatives from government (BoARD), development agents, NGOs, church leaders, local leaders, and *kebele* (local administration) chairperson screens the seed needy households in target locations. Crop and variety targeting is mostly handled by implementers with little consultation of farmers.

Direct seed distribution and seed fair and vouchers were seed delivery methods practiced by different seed aid practitioners. Box 1 shows the views of seed aid providers on the process and prospect of seed aid provision.

Views of seed aid recipients

About 39% of the recipient farmers indicated that recurrent drought leading to harvest shortfall made them prone to seed shortages. Seed shortages for planting because of food deficit, lack of cash to buy seed and unavailability of seed on the local market at the time of crisis are other important factors that force farmers to look for external seed assistance.

The results from the aid recipients survey indicated that even under stress situations, farmers access seed from different sources (Table 1). In Table 2 aid crop refers to specific or group of crops delivered during the most recent relief intervention. The seed from very recent relief aid covered up to 57% of aid crop-1 and 78% of aid crop-2 planted by farmers (Table 1). Farmer-based seed sources, i.e. own saved stocks and local markets for aid crop-1 and local markets for aid crop-2, were important sources for planting following seed relief. Other sources like gifts, exchange in-kind and seed from formal sector through the extension program played very little role.

Table 1. Seed sources of all seed planted in the aid season at Humbo *woreda*

Seed sources	% of all seed planted		
	Crop-1†	Crop-2†	Both
Seed relief	56.5	78.0	60.9
Own stock	19.7	4.3	16.6
Local markets	18.8	10.5	17.1
Gifts	2.1	0.0	1.7
Exchange in-kind	0.3	2.1	0.7
Extension (BoARD)	2.5	5.2	3.1

Source: Farmer survey, 2006; † contribution of seed aid of specific crop supplied in specific season to overall household seed supply of recipient farmers

Seed aid covered diverse crops and a particular intervention supplied one or two crops per farmer during a given emergency season (Table 2). About 27% of farmers surveyed received two crops at their most recent seed relief event. Year 2005 was the most recent seed relief event for 52% of the sample farmers whereas only 1% indicated year 1999 (Table 2) showing the most recent seed relief event for farmers in Humbo was between 1999 and 2005.

Table 2. Most recent seed aid year and crops for a particular seed recipient farmer

Year	Cases (n=144)	%	Crop-1	Crop-2
1999	1	1	Chickpea	-
2000	3	2	Maize, potato	Beans
2001	5	3	Maize, tef	Chickpea, tef
2002	6	4	Maize, beans, teff, cotton	Maize
2003	14	10	Maize, potato, chickpea, beans, sorghum, tef, cotton	Maize, beans, sorghum
2004	40	30	Maize, potato, chickpea, tef, cotton	Maize, beans potato, chickpea, cotton
2005	75	52	Maize, potato, chickpea, beans, tef, cotton	potato, beans, chickpea, tef, sorghum, cotton

Source: Farmer survey, 2006

Maize and chickpea were the most recent seed relief delivery to the majority of farmers surveyed (Table 3) with 43% and 22% of the sample farmers, respectively. Other crops recently provided to farmers were sweet potato, common bean, sorghum, tef and cotton.

The seed aid providers used both modern and local varieties (Table 4). For maize, mostly open pollinated modern varieties were used whereas for sweet potato a local or 'creolized' modern variety was used. For other crops, both modern and local varieties were distributed depending on seed availability.

In the Humbo context, emergency seed delivery made significant contribution to the needs of stress affected farming communities (Table 5). The contribution of aid as seed source varied from 42% (for maize) to 100% (sorghum). Earlier studies indicated seed aid contributes to farmers' seed need but not in a major way (Sperling, 2002; Longley *et al*., 2001; Haugen and Fowler, 2003). A slightly higher contribution of seed aid (60%) to overall household seed requirements in the study area could be attributed to recent changes in the seed aid implementation process. There is a shift from mass targeting to more accurate targeting of both the area and the beneficiary. This has resulted in reaching needy farmers who have little means to access different seed sources in times of crisis.

Table 3. Recent seed aid crops and varieties received by sample farmers

Crop	No of cases[1]	%	Varieties supplied
Maize	62	43	BH-140, BH-660, CG-4141, Katumani (improved)
Sweet potato	13	9	Gadissa (Creolized)
Chickpea	31	22	Dessi and kabuli (unknown)
Haricot bean	9	6	Red Wolaita (local)
Sorghum	4	3	Improved (unknown)
Tef	13	9	White (local)
Cotton	12	8	Akala (improved)
Total	144	100	

[1]Sum of aid crop 1 and 2. Source: Farmer survey, 2006

Table 4. Crop varieties (%) used in recent seed relief provision at Humbo *woreda*

Crops	% of varieties used	
	Modern variety	Local variety
Maize	100	0.0
Chickpea	39.3	60.7
Common bean	20.0	80.0
Tef	53.8	46.2
Sweet potato	0.0	100.0
Cotton	27.3	72.7
Sorghum	50.0	50.0

Source: Farmer survey, 2006

Table 5. Seed relief contribution to needs for different crops at Humbo *woreda*

Aid crops	Seed aid as % of total planted
Maize	41.4
Chickpea	84.8
Common bean	90.1
Tef	94.5
Sweet potato	51.2
Sorghum	100.0
Average	59.9

Source: Farmer survey, 2006

Effect of seed aid on seed system resilience

Table 6 indicates the views of farmers on the impact of emergency seed relief on agricultural resilience. About 80% of sample farmers indicated that seed relief has positively contributed to their livelihoods. One of the key impacts of seed aid is the introduction of new crops and/or varieties to farmers or affected

regions. About 23% of the sample farmers stated seed aid had supplied a new crop and about 74% indicated they accessed a new variety (ies). Many farmers who said they obtained new crops and varieties through seed relief reported still using them.

On the other hand, 24% of sample farmers reported the negative effects of seed aid. These include eroding long-standing tradition of maintaining own seed stock and creation of dependency syndrome. Traditionally farmers save their own stock of seed for the next season. Some farmers (25%) indicated that this tradition has been affected by continuous supply of seed aid in the area. However, the majority of sample farmers stated that seed aid has not significantly affected the local traditions of seed saving, giving to relatives, bartering networks and exchange practices.

Table 6. Farmers' perception on the effect of seed aid practice on seed system

Variable	% response (n = 113)	
	Yes	No
Positive effects of seed aid?	79.6	20.4
Negative effects of seed aid?	23.9	76.1
Grown new crops because of seed aid?	23.0	77.0
Still using new crops?	22.3	77.7
Grown new varieties from seed aid?	73.5	26.5
Still using new varieties	65.5	34.5
Seed aid influenced seed saving	24.8	75.2
Seed aid influenced seed gift practice	16.8	83.2
Seed aid influenced local markets	22.1	77.9
Seed aid influenced barter networks	8.8	91.2

Conclusion

The way farmers access seed in normal and stress situations may differ depending on the biophysical and socio-economic contexts. Under normal situations, usually farmer-based seed sources (mostly own savings and local markets) are the major seed sources. Under stress situations, farmers access seed in various ways including seed relief. Emergency seed relief contributes to the seed needs of the farming community but does not totally substitute other seed sources. Seed relief has become a major seed sources in recent years. Local markets also play an important role under stress situations.

From discussion with key informants (GOs and NGOs) and from detailed household surveys, it is clear that different practitioners used several crops, varieties and seed sources during seed relief delivery. During a crisis seed aid providers sourced seed from local markets (local farmers, traders at seed fairs), national bids (bulk purchase for direct seed distribution), research centers, cooperatives, private seed enterprises and public seed companies. The wide range of seed sources is a good indicator for the possible availability of seeds in times of crisis (non-catastrophic) if one has means to access it. Local grain/seed traders play a key role in ensuring or improving seed availability. They can move seeds from different places to wherever the demand exists. This was substantiated during the seed fair and voucher approach at Humbo, when local traders supplied considerable amounts of seed needed for the relief operation.

Seed provision to farmers at Humbo is of two kinds: developmental seed aid and emergency seed aid. Developmental seed aid includes popularization and demonstration of improved crop production technologies taking seed as a core element to improve people's livelihoods in marginal food insecure environments. Chronically food insecure households are mostly the beneficiaries of developmental seed aid initiatives. Emergency seed aid includes mass seed distribution to a large number of farmers affected by a short event (e.g. drought, flood). Drought is the major trigger of emergency seed intervention at Humbo.

Direct seed distribution, and seed fair plus vouchers, were used by different seed aid practitioners. The study revealed that there was no seed need assessment as such and no organized periodic monitoring and evaluation of seed aid distributed to farmers. Instead, pre- and post-harvest crop assessments are used as a means of evaluating field performances. As stated by GO and NGO practitioners, there is a change in trend in the process of seed aid intervention (see Box 1).

Seed aid has both positive and negative impacts on agricultural stability. Both farmers and practitioners agree that seed aid improves agricultural stability by providing new varieties and crops. On the other hand, there is a shared concern among all practitioners that seed aid is eroding long-standing traditions of seed selection and conservation, and creating a dependency syndrome among farming communities.

Box 1: Reflections of seed aid providers in seed delivery practice		
	Opinion of GO practitioners	Opinion of NGO practitioners
Trends of emergency seed aid in the area	• Many crops included in recent years • Increased interest in local varieties • Shift from mass to more accurate targeting • Specific crop for specific ecology or target area • Cropping season approach becoming more important (crops appropriate for the particular season) • Increase in both volume and frequency of aid	• Fine tuned to right targeting • Inclusion of stringent seed needy selection criteria • Increased participation of govt in the process • Approach has changed from direct seed distribution to seed fair, voucher system, cash relief • Scale of seed aid increasing in parallel with food aid
Key elements to improve effectiveness of seed aid	• Strengthen early warning system and easy access to information • Improve seed needy selection/screening system • Consider farmers' interest in choice of crops and varieties • Change farmers' perception on aid expectation (break dependency syndrome) • Regular monitoring and evaluation • Impact assessment • Collaboration of donors and implementers in seed need assessment, implementation, monitoring and evaluation • Enhanced linkage among donors, region, zonal and *woreda* level agricultural officers and local community • Timeliness of seed aid distribution • Quarantine and inspection of seed quality • Appropriate seed sourcing and variety choice • Implement revolving seed system	• More consultative meetings with community and govt • Practice strong seed need assessment • Establish early warning system and preparedness • Develop community seed banks with active involvement of govt in seed provision and collection
Constraints to seed aid	• Late distribution of seed aid at farmgate • Absence of complementary inputs (fertilizer, pesticide) as a package • Introduction of improved varieties from other places which are inferior to local variety (e.g. sweet potato) • Poor seed quality control system (purity and germination tests) especially for locally purchased seed	• Crop assessment without sufficient consultation with farmers • Donor and NGO pressure • Limited or ineffective technical backstopping from govt • Govt does not express sufficient 'ownership' of the program • Govt offices lack budget for overhead cost in implementing the program
Changes practitioners wish to see	• Collaborative & periodic monitoring and evaluation by GOs, NGOs and donors • Strong linkage and partnership among seed aid practitioners • Impact assessment by internal and external bodies	• Reduced donor and NGO pressure on the aid process (donors should be open to technical debate especially on approach and criteria) • Seed quality control and availability problems (mismatch between seed supply and demand) • Delayed budget approval

A significant proportion of farmers (25%) explicitly indicated that their tradition of seed saving has been affected by continuous supply of seed aid in the area.

Seed assistance aims to ensure that communities affected by catastrophes like drought should have basic seed as soon as possible to accelerate the process of agricultural recovery for producing their own food. However, attention should be given to base interventions on actual seed need assessment and rapid, timely seed delivery.

Acknowledgment

This work was part of the national project funded by IDRC and USAID's Office for Foreign Disaster Assistance and led by Dr Louise Sperling. The authors gratefully acknowledge the research funding and overall technical support from national project research team. The authors also thank the South Agricultural Research Institute (Awassa and Areka research centers) for the support provided during fieldwork.

References

Asfaw, A., C. Almekinders,, G. Degu, and F. Alemayehu. 2007. Bean seed flow and exchange networks in Southern Ethiopia. *Seed Info. No.* 33.

CRDA. 1990. Five year review of the CRDA general rehabilitation program (1985-1989). Unpublished report. CRDA, Addis Ababa, Ethiopia.

Haugen, J. and C. Fowler. 2003. Reassessing the need for emergency seed relief post-disaster: the case of Honduras after Hurricane Mitch. The Journal of Humanitarian Assistance, 6 February 2003 posting. (http://www.jha/ac/articles/ a113.htm).

Longley, C. 1997. Effects of war and displacement on local seed systems in northern Sierra Leone. *In* Sperling, L. (ed). War and Crop Diversity. AGREN Network Paper no.75. London: Overseas Development Institute.

Longley, C., R. Jones, M.H. Ahmed and P Audi. 2001. Supporting local seed systems in southern Somalia: a developmental approach to agricultural rehabilitation in emergency situations, AGREN network paper No 115.

Sperling, L. 1997. The effects of the Rwandan war on crop production and varietal diversity: a comparison of two crops. *In* Sperling, L. (ed). War and Crop Diversity. AGREN Network Paper no.75. London: Overseas Development Institute.

Sperling, L. 2002. Emergency seed aid in Kenya. Some case study insights from lessons learned during the 1990s. *Disasters* 26(4). 283-287.

Sperling, L. and D. Cooper. 2003. Understanding seed systems and strengthening seed security. Background paper. *In* Sperling, L., Osborn, T. and Cooper, D. (eds). Towards Effective and Sustainable Relief Activities. A stakeholder workshop, Rome, 26-28 May 2003. Rome: FAO Plant Production and Protection paper 181. http://www.fao.org/docrep/007/y5703e/y5703e00.ht. Visited on 8 December, 2007.

Sperling, L., A. Deressa, S. Assefa, T. Assefa, B. Amsalu, G. Negusse, A. Asfaw, W. Mulugeta, B. Dagne, G. Hailemariam, A. Tenaye, B. Teferra, C. Anchala, H. Admasu, H. Tsehaye, E. Geta, D. Dauro and Y. Molla. 2007. Long-term seed aid in Ethiopia: Past, present & future perspectives, Addis Ababa and Rome: EIAR, CIAT, ODG. Project and report funded by IDRC and USAID-OFDA. 141pp.

MEETINGS AND COURSES

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

Conferences

8th AFSTA Annual Congress 2008, 26-29 February 2008, Casablanca, Morocco. The 8th AFSTA General Assembly will be held in Casablanca, Morocco. Registration started in mid-November 2007. The Moroccan Seed Association (AMSP) will organize the Congress. For more information please contact: Secretariat, AMSP, 2, rue El Kaf Apt. No 1 Hassan, Rabat, Morocco; Tel: +212-37-26.35.00; Fax: +212-37-263501; E-mail: amsp@iam.net.ma. More information is available on the AFSTA website www.afsta.org.

World Seed Congress 2008, 26-28 May 2008, Prague, Czech Republic. The Czech Republic will host the World Seed Congress in 2008. The National Organizing Committee is planning to include several tours in Prague and surrounding areas in the registration fee for accompanying persons. The congress will be followed by the ISF 4th Seed Treatment conference on 29 May 2008. The conference will focus on recent developments in technical, regulatory and practical aspects of seed treatments; with a special focus on Eastern European Countries. Registration begins on 3 January 2008. For more information contact ISF Secretariat - Chemin du Reposoir 7 - 1260 Nyon Switzerland; Tel +41 22 365 44 20; Fax +41 22 365 44 21; E-mail: isf@worldseed.org; Website www.seedworld.org

ISTA Annual Meeting 2008, 16-19 June 2008, Bologna, Italy. The meeting is aimed at discussing and deciding on proposals for changes to the ISTA International Rules for Seed Testing and business of the association, with the international participation of ISTA delegates and representatives from both the seed industry and governments including experts in seed technology, scientific research and laboratory accreditation. The annual meeting will also focus on testing of specified traits including the presence of GM seeds in non-GM seed lots.

9th ISSS Conference on Seed Biology, 6-11 July 2008, Olsztyn, Poland. The conference of the International Society of Seed Science (ISSS) will be held at the University of Warmia and Mazury in Olsztyn, Poland. It will highlight the recent advances in seed science and research and will include seed development and maturation; seed dormancy and germination; seed ecology; seed stress tolerance; seed technology; seed germplasm preservation and alternative seed uses. For more information, please contact: E-mail: info@seedbio2008.pl or visit the website at: www.seedbio2008.pl

International e-Conference on Agricultural BioSciences 2008 (IeCAB 2008), 2-16 June, 2008. This is an internet conference with minimal participation expenses since it can be attended from your office, home or any other place with internet access. Participants incur no expenses for transportation, hotel accommodation, per diem, visa, etc. The conference will take place at URL address http://www.e-conference.elewa.org /agriculture.

Deadline for submitting abstracts is 29 February 2008. All submissions entered will be published as full reviewed papers in a special volume of the online *Journal of Applied BioSciences*. Full details on how to participate are available at http://www.e-conference.elewa.org/agriculture.

Courses

ISTA Training Workshops in 2008

- ISTA Seed Health Testing Workshop, 7-11 April 2008, Pretoria, South Africa
- 6th ISTA Seed Health Symposium, 14-18 April, Berg en Dal, Kruger National Park, South Africa
- ISTA Seed Vigor Workshop, 15-18 April, Bologna, Italy
- ISTA Workshop on Species and Variety Testing and Verification, 21-25 April, Freising-Munich, Germany
- ISTA Workshop on Seed Moisture, Germination and Vigor, 30 June - 4 July, Nakuru, Kenya
- ISTA Purity, Germination and Tetrazolium Test on Tropical and Subtropical Seeds, 28-31 July, Córdoba, Argentina
- 8th ISTA Seminar on Statistics in Seed Testing, 22-26 September, Roelofarendsveen, The Netherlands

For detailed information or to register, see the following link https://www.seedtest.org/stream/nl-l---1--%40a3a28d620689--60.html

Organization and Management in the Seed Sector, 23 June to 4 July 4, 2008, Germany. The training addresses managers, researchers, extension and technical staff both from public and private sector. To receive further information and application forms please declare your interest through an informal message. The deadline for application is April 11, 2008. Please send all messages and inquiries to:
SeedConcept Paul Hoesch St. 4 Tel & fax: 0049-89-82085522 81243 Munich; Mobile: 0049-171-1285132, Germany; E-mail: walter.haege@gmx.de

Plant Breeding and Seed Production: Phase 1: 1-26 September 2008 and Phase 2: 23 February– 6 March 2009. SIDA offers, as part of its bilateral development assistance, advanced international training programs for cooperating countries based on identified priorities and needs. The main objective of this training program is to enhance the participants' managerial efficiency by increasing their knowledge in all the essential elements of a modern seed industry.

The program is divided into five modules: (ii) Seed policy, laws and regulations including certification and GMO regulations; (ii) Plant breeding and agricultural biotechnology; (iii) Seed production and processing including seed treatment and storage; (iv) Business development and marketing; and (v) Project management and communication. It is divided into two phases. The first phase, 1-28 September 2008, will take place in Svalöv and Stockholm, Sweden. Phase 2 will be held in one of the participating countries between 23 February to 6 March 2009. Between

the two phases participants will work on their 'Projects of Change' in their respective home countries.

For all information or communication contact: Svalöf Consulting AB, Marie Hardfors, Onsjövägen 19, SE-268 31 Svalöv, Sweden; Tel: +46-418 66 51 22; Fax: +46 -418 66 37 33;E-mail: marie.hardfors@svalofconsulting.com; Website: www.svalofconsulting.com

LITERATURE

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

Books

Louwaars, N. 2007. Seeds of Confusion: The Impact of Policies on Seed Systems, Wageningen University, The Netherlands. This volume, the text of which is freely available on the internet (http://library.wur.nl/wda/dissertations/dis4307.pdf) gives credit to the importance of seed in agriculture and food, but also in the debate on innovation, biodiversity and traditional knowledge. It starts out identifying the roles of the farmers' and formal seed systems and stresses the need for multiple linkages in order to make optimal use of the complementary knowledge of farmers' and scientists and the value of local and introduced plant resources.

Making such linkages may be difficult taking into account the prevailing seed regulations that are designed to regulate the formal system only without taking into account the value of integrating different systems. An analysis is made of 40 national laws, which yields some interesting examples of how such laws can be optimally designed.

The next chapter deals with the impact of biodiversity regulations. Based on three regional approaches for access and benefit sharing, the main issues of these rules in relation to seed system development are discussed. Chapter 5 then deals with yet another set of rules, this time based on economic development and trade agendas. The impact of Plant Breeder's Rights and patent laws on such diversified seed systems is analyzed, based on the literature and on large numbers of interviews with stakeholders in five countries.

Finally, Louwaars analyzes why the different regulatory systems are so poorly connected; why international agreements may be consistent in legal terms, but totally incoherent at policy level, creating significant problems for national policy makers and legislators to implement these unambiguously. One explanation is the poor coordination between ministries within a country. Agriculture (seed laws and ITPGRFA), environment (CBD), commerce (WTO) all have their own ideas and may not even realize that their decisions impact the ways that farmers may handle their seed. Secondly, policy making within a dossier is a complex process with different stakeholders influencing different Ministries.

Finally, a disconnection between different levels may be to blame: policy makers in international fora are poorly connected to their counterparts at national ministries and they are in turn at long distance from the farmers' reality.

The result of this is confusion, juridification and finally hyperownership, since national rights (CBD), group rights (ITPGRFA), community rights (WIPO-IGC) and private rights (WTO) may at the same time rest on the same seeds. It is a good thing that the book finally mentions a number of options to reduce negative effects of this confusion: slight adaptations of seed laws, plant breeders' rights systems and access laws can yield a significant improvement.

The complex issues that this book deals with are not always easy reading. For seedsmen who have a good foundation in seed supply systems, reading this is definitely rewarding.

Yadav, S.S., D. McNeil and P.C. Stevenson (eds) 2007. Lentil: An Ancient Crop for Modern Times. This book covers all aspects of diversity, breeding and production technologies and the contents include: (i) Origin, adaptation, ecology and diversity; (ii) Utilization, nutrition, and production technologies; (iii) Genetic enhancements, mutation, and wild relatives; (iv) Breeding methods and lensomics achievements; (v) Productivity, profitability and world trade. The book presents the most comprehensive and up to date review of research on lentil production systems, biotic and abiotic stress management, quality seed production, storage techniques, and lentil growing around the world.. It is useful o legume breeders, scientists, nutritionists, academic researchers, graduate students, farmers, traders, and consumers in the developed and developing world. Chapter 21 by Zewdie Bishaw

Abdoul Aziz Niane and Yantai Gan deals with quality seed production of lentil. Published by Springer; Hardback 978-1-4020-6312-1; Price: €174.02; 461 pp

Brescianti, F. and A. Valdes (eds) 2007. Beyond Food Production: The Role of Agriculture in Poverty Reduction. Most incidences of poverty are concentrated in rural areas and farming is a major source of income to the rural poor. Therefore, the argument goes, agricultural growth is a good way to reduce poverty. In reality, however, things are not quite so clear-cut. Produced by FAO, *Beyond Food Production* takes a closer, statistic-led look at some of the issues affecting rural agricultural communities en route to development. The results from studies on three continents are intriguing, if divergent, but the analysis is aimed at readers with a firm grounding in econometrics. Edward Elgar Publishing; ISBN 978 92 5 105534 2(Hb); Price: £59.95; 240pp; Website: www.earthprint.com/fao, www.fao.org/icatalog/inter-e.htm2007.

Diao, X., P. Hazell, D. Resnick and J. Thurlow. 2007. The Role of Agriculture in Development: Implications for Sub-Saharan Africa. Agro-pessimism has been a recent feature of development debates on Africa, with a growing chorus of voices denouncing the role of agriculture in poverty alleviation. This IFPRI report jettisons such claims, contending that agricultural development – particularly in the food staples subsector – is as vital as ever in the continent. Case studies from Ethiopia, Ghana, Rwanda, Uganda and Zambia find that broad-based agricultural growth, especially in conjunction with growth in the non-agricultural sector, is critical to poverty reduction and an important precursor to industrialization. The report reaffirms the ongoing significance of agriculture in development and serves as a decisive *touché* to the skeptics. International Food Policy Research Institute (IFPRI); Price: US$10; 66pp; Website: www.ifpri.org/pubs/pubs.htm 2007

Useful Websites

E-agriculture.org

The UN Food and Agriculture Organization announced the launch of a unique interactive web-based platform (http://www.e-agriculture.org, focusing on the role that Information and Communication Technologies (ICT) can have in supporting agriculture and rural development.

The online platform, will enable users to exchange opinions, experiences, good practices and resources related to e-agriculture, and to ensure that the knowledge created is effectively shared and used worldwide. Developed by global stakeholders in collaboration with FAO and partners, the platform is part of an e-agriculture Community of Expertise, a global initiative to enhance sustainable agricultural development and food security by improving the use of ICT in the sector.

The Community includes policy makers, rural service providers, development practitioners, farmers, researchers and information and communication specialists involved in agriculture and rural development.

Over 3400 stakeholders from 135 countries were involved in the development of the platform. They participated in an online survey, providing relevant content, and joining in virtual forums held during July and August 2007. To join the e-agriculture Community of Expertise, please visit http://www.e-agriculture.org

From gene to green

It took a century to go from Mendel's plant breeding experiments to the genetic code. The Molecular Genetics Explorer can help biology students make the same intellectual journey by connecting changes in an organism's DNA to alterations in its appearance.

The free virtual lab comes from Brian White and Ethan Bolker of the University of Massachussetts, Boston. Students begin by setting up plant crosses and gene mutations to decipher the inheritance of color in fictional flowers. They then move to the protein level, tinkering with amino acid sequences to see how changes alter a protein's shape and the flower color it produces. The final exercises let users determine the consequences of manipulating DNA. Visit the website: http://intro.bio.umb.edu/MGX/. *Source: Science Vol 317:433*

Biofuels

The Science Development Network (SciDev) a portal that disseminates news, views and information about science and technology captures the issues in the debate on biofuels, and

looks at the reality of biofuels research and development in the developing world. For articles, visit:www.scidev.net/dossiers/ index.cfm

Program on Participatory Research and Gender Analysis
The CGIAR Systemwide Program on Participatory Research and Gender Analysis develops and promotes methods and organizational approaches for gender-sensitive participatory research on plant breeding and on management of crops and natural resources. Visit the website: http://www.prgaprogram.org /

New Journals

Journal of Applied Biosciences
This new open access peer reviewed journal is inviting manuscripts in biosciences research, particularly applied research cutting across agriculture (crops and livestock), health (animals and human), food processing, industrial and environment management biosciences. Please visit the journal homepage http://www.biosciences.elewa.org/ for more information and submission instructions.

Journal of Lentil Research
The Lentil Research Association (LRA) and ICARDA, the world's lead centre of lentil research, has agreed to be a co-publisher of the Journal of Lentil Research. You are invited to contribute research articles as well as articles on extension, popularization, trade and utilization of lentils. Please also encourage other lentil workers to contribute articles. For more information please contact LRA at the following address: lentilresearch@rediffmail.com

First Announcement

Central Asia and Caucasus Seed Trade Conference (CACSTC)

The conference aims at promoting seed trade between the CAC region and the rest of the world. It will not only provide opportunities for seed trade, but also contribute to dialog between the private and public sectors to promote seed trade in the region. It also presents the status and prospects of seed markets for agricultural and horticultural crops in the CAC region and case studies on seed sector privatization; seed farm mechanization and equipment; crop diversification; and developments in production of industrial crops. A major focus of the conference will be trade exhibitions by seed companies, seed equipment manufacturers, agricultural input supply companies, and agricultural machinery manufacturers. Companies interested in participating in the conference or exhibiting their products should contact the conference secretariat.

Conference Information

More information on the conference will be available on the following websites:
ECO: http://www.ecosecretariat.org (Russian and English)
ICARDA:http://www.icarda.cgiar.org/announcement/seedtradeconf_jun08.htm (English)

Conference Secretariat

Conference Secretariat, 1-Golbou Alley, Kamranieh, Tehran, I.R. Iran, Tel: +98-21-22829479; Fax: +9821-22829480; E-mail: seedconference@yahoo.com; Website: www.ecosecretariat.org