SEED INFO

Official Newsletter of the WANA Seed Network

ICARDA

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EDITORIAL NOTE

Seed Info aims to stimulate information exchange and communication among seed staff in the Central and West Asia and North Africa (CWANA) region. The purpose is to contribute to the development of stronger national seed programs, which supply quality seed to farmers.

The coexistence of genetically modified (GM) with non-GM crops is one of the center stages of debate regarding the application of biotechnology in agriculture.

In the **NEWS AND VIEWS**, Anke van den Hurk, presents the measures of coexistence of GM and non-GM crops in conventional and organic farming with particular reference to the Netherlands. She argues that coexistence is not a new issue in the farming community or the seed industry, where there is long history of growing different crops side-by-side and producing pure seed stocks. Measures for coexistence should be established in countries where labelling thresholds for the adventitious presence of GM products in conventional and organic ones exists. It is important that coexistence measures are specific, efficient, cost-effective, proportionate, and implemented at the appropriate scale. They should by no means lead to severe restriction or ban of one type of production.

We bring you news from seed congresses of the African Seed Trade Association and International Seed Federation held in March and May 2006, respectively. There are also news from the International Seed Testing Association, European Union, and the International Convention for the Protection of New Varieties of Plants.

The section on **SEED PROGRAMS** includes news from Iran on the meeting of national focal points of the regional TCP project of FAO and ECO (Economic Cooperation Organization) held from 22 to 24 May 2006 in Karaj, Iran, and hosted by the Seed and Plant Certification and Registration Institute. We report on the initial planting of Bt cotton in Pakistan, which has benefited farmers through a significant increase in yield and reduction in the use of insecticide, compared to conventional cotton varieties. The Pakistan Atomic Energy Commission distributed seed of Bt cotton varieties to be grown in over 8,000 acres in the 2005/06 cropping season with special permission from the Ministry of Environment, under the 'Voluntary Code of Conduct for Release of GMO into the Environment'.

In the **HOW TO** section, Abdoul Aziz Niane discusses the practical options of variety maintenance and source seed production of farmer-bred varieties through participatory plant breeding. We invite our readers to contribute to this debate and share with us their practical experiences.

The **RESEARCH** section is aimed at capturing information on adapted research or issues relevant to seed program development in the region or elsewhere. Tippawan Manond et al of Rajamangala University of Technology, Lanna, present the results of a two-year participatory action-oriented technology transfer strategy for community soya bean seed production in northern Thailand.

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

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 for CWANA Region

After a successful First International Seed Trade Conference held 29 November to 1 December 2005 in Antalya, Turkey, the National Seed Council of Egypt, the Turkish Seed Industry Association, and the International Center for Agricultural in the Dry Areas announce the Second International Seed Trade Conference in CWANA Region (2nd ISTC2007) holding in October 2007 in Cairo, Egypt. The ISTC2007

conference aims at promoting seed trade within and between Central Asia, West Asia and North Africa (CWANA) and the rest of the world. The conference will provide opportunities for seed trade and contribute to the dialogue on private-public sector partnership and harmonization of regulatory frameworks to promote seed trade in the region. A major event at the conference will be trade exhibitions by seed companies, seed equipment manufacturers, agricultural input suppliers, and agricultural machinery manufacturers. Companies interested in participating in the conference or wishing to exhibit their products should contact the Conference Secretariat. The conference will overlap with the Cairo Agricultural Fair, an international exhibition of agriculture, horticulture and floriculture held every year. *Zewdie Bishaw and A.J. G. van Gastel, Seed Unit, P.O. Box 5466, Aleppo Syria; Fax: ++963-21-2213490; E-mail: z.bishaw@cgiar.org*

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ICARDA Orgnaizes Regional Workshop on Liberalization of the Seed Sector

The ICARDA Seed Unit orgnaized a regional workshop on "Liberalization of the Seed Sector in Developing Countries" on 13–16 March 2006 in Aleppo, Syria. The Japan International Cooperation Agency (JICA) and the State Planning Commission of Syria provided financial support for the workshop. The purpose of the workshop was to inform both policymakers and senior technical managers from CWANA on issues related to the liberalization or privatization of the seed sector. The specific objectives were to:

- create awareness among senior managers and policymakers of changing trends in seed industry development;
- review existing policies and regulatory frameworks relevant to the liberalization/privatization of the seed sector;
- review the status and assess existing opportunities for liberalization or privatization of the seed sector; and
- identify constraints, discuss recommendations, and develop action plans in the participating countries to encourage private sector participation.

Each participant prepared a background paper on the agricultural sector in general and the seed industry in particular. Emphasis was on the role of the public and private sectors in the respective countries. It described the status, constraints, opportunities, recommendations, and options for liberalization or privatization to encourage entry of the private sector.

Key resource persons from ICARDA presented background papers on the recent trends in seed industry development. Particular emphasis was on liberalization or privatization, status of seed regulatory frameworks, status and trends in agricultural biotechnology and their future impact on national and regional seed sector development in CWANA region. The presentations gave an insight into key policy, regulatory, institutional, technical, and organizational issues on varieties and seed in the respective countries. The ensuing discussions highlighted key constraints to private sector participation and identified possible alternatives to overcome them.

Participants in the meeting made recommendations and action plans to promote liberalization or privatization of the seed sector. The working groups (a) identified major constraints, and (b) provided recommendations on (i) policy and regulatory frameworks, (ii) incentives and technical support, and (iii) the role of international organizations. Recognizing that seed is a key input in agricultural development, the participants suggested that governments should have the political will and commitment to develop the seed industry and promote a market economy that will facilitate entry into and growth of the private seed sector.

Participants of the regional workshop on Liberalization of the Seed Sector at ICRDA Headquarters in Aleppo, Syria

The participants recommended that ICARDA and everyone present should ensure wider distribution of the workshop recommendations to Ministers and Ministries of Agriculture, national seed councils, seed trade associations (national, regional, international), national seed regulatory agencies, etc. This is to create awareness among the stakeholders. They also called for the formation of seed associations that would represent the interest of the private sector and lead the dialogue with the government to promote the development of a competitive seed industry.

Participants in the workshop included policymakers, advisors, and senior managers representing different sectors of the seed industry including the Ministries of Agriculture and the public and private seed sectors from nine countries. They were a mix of public (8) and private (8) sector participants from Afghanistan (4), Syria (5), Egypt, Eritrea, Ethiopia, Jordan, Pakistan, Sudan and Turkey. Private sector participants included representatives of multinational seed companies and large and medium foreign and domestic seed companies. *Zewdie Bishaw and A.J. G. van Gastel, Seed Unit, P.O. Box 5466, Aleppo Syria; Fax: +963-21-2213490; E-mail: z.bishaw@cgiar.org*

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Dr Zewdie Bishaw Appointed Head of Seed Unit

On 11 May 2006, The Director General of ICARDA, Dr Mahmoud Solh, announced the appointment of Dr Zewdie Bishaw as the new Head of Seed Unit. Dr Bishaw takes over from Dr Antonius van Gastel, who retired after serving the Unit, first as Seed Production Specialist, and then as Head for many years. Dr Bishaw obtained his Bachelors degree in Plant Sciences from Alemaya College of Agriculture, Addis Ababa University, Ethiopia. He obtained his Masters degree in Seed Technology from Edinburgh University, Scotland, UK, and a PhD in Production Ecology and Sustainable Conservation with specialization in Seed Technology from Wageningen University, the Netherlands.

He served as Lecturer at Awassa College of Agriculture, Addis Ababa University, before joining the Ethiopian Seed Corporation as Agronomist and Seed Production Officer within the Seed Production Department. He was later appointed as Head of Seed Quality Control Department and Seed Processing and Storage Department of ESE, before joining ICARDA in December 1989.

At ICARDA, he worked as Seed Production Specialist and Training Officer until 1996, when he became Acting Head of Seed Unit (1996–1997), and later as Seed Systems Specialist and Coordinator of the WANA Seed Network.

Dr Bishaw has vast experience in seed industry development at the national, regional, and global levels, particularly in seed policy and regulatory frameworks, formal and informal seed supply systems, and human resource development. He has practical experience in technical aspects of seed science and technology.

We wish him success in his new assignment.

NEWS AND VIEWS

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

Coexistence Measures for Genetically Modified Crops, Conventional and Organic Farming in the Netherlands

Coexistence is neither new nor revolutionary. The farming community and the seed industry have a long history of growing different crops side-by-side and producing pure seed stocks. Coexistence between conventional, organic, and genetically modified (GM) cultivation is a purely economic issue and has nothing to do with product/crop safety. Measures for coexistence should be established in countries where labelling thresholds for the adventitious presence of GM products in conventional and organic crops exist. Measures that separate the different product lines are established in the Netherlands, thereby making coexistence possible. It is important to ensure that coexistence measures are specific, efficient, cost-effective, proportionate, and implemented at the appropriate scale. In no case should they lead to the severe restriction or ban of one type of production.

Introduction

Coexistence of various production methods is not a new concept in agriculture. Breeders and farmers are accustomed to breeding and producing different crops such as waxy and non-waxy maize, white and yellow maize, hot and sweet peppers, and high and zero erucic acid oilseed rape, next to one another. They are also accustomed to producing certified seed with different purity standards. This means that coexistence of a wide range of production methods is not a problem, provided technical and procedural guidelines are carefully followed and cooperation among farmers in the neighbourhood is encouraged.

Since the last decade, production methods have been frequently classified into three main groups: conventional, organic and production using GM crops. In some countries, GM products are treated the same as their non-GM counterparts as soon as they have been proved to be safe and authorized for food and feed and deliberate release into the environment. This is strongly endorsed in the seed industry. In countries where GM products are treated differently from non-GM products, labelling is compulsory. Thresholds for adventitious presence of GM products in conventional products have been adopted as labelling trigger points, e.g. 0.9% in Europe, 4% in Brazil, and 5% in Japan.

The Situation in Netherlands

In the Netherlands, co-existence is based on the recommendation of the European Commission (2003/556/EC). Member countries develop national strategies and best practices for coexistence. The government of Netherlands has been reluctant to design new laws at a time that it is trying to curtail the administrative burdens of producers. Therefore, a small committee of stakeholders, consisting of conventional and organic farmers as well as the seed sector, was invited to discuss and agree on a voluntary coexistence rule. The Minister of Agriculture saddled the committee with the task of creating a practical approach for coexistence, which could be accepted by everyone involved. He recommended that the approach should be balanced and provide farmers the 'freedom to operate' with minimum economic damage by GMO admixture, with provision for legal claims for liability.

The committee first concluded that coexistence should be seen from the context of the economic consequences of adventitious presence of material from one crop in another. Product or crop safety is not an issue, because the GM varieties that are grown have been given full regulatory approval. All stakeholders further agreed that interaction between the different forms of agriculture cannot be totally avoided, and that measures must ensure that the damage is minimised (100% GMO-free cannot be guaranteed).

Secondly, based on the principles that the measures of coexistence should be efficient, cost-effective and proportionate, a package of practical measures was prepared and agreed upon for GM, conventional, and organic farmers. The measures were focused on potato, sugar beet, and maize because they are the most relevant crops, considering the availability of GM varieties in the Netherlands.

Thirdly, they recommended that a farmer intending to grow GM crops must communicate his intentions to his neighbours at an early date. He should also register his intent in the national register before 1 February of each year. In all stages of production, i.e., planting, growing, harvesting, on-farm transport, and storage, measures must be taken to prevent the mixing of GM and non-GM crops. Such measures include thorough cleaning of machinery, maintenance of isolation distances, prevention of volunteer crops and spillage, and separate storage.

Isolation distances during production seem to be most effective to prevent admixtures. The GM crop farmer must keep a distance of 3 m from potato, 1.5 m from sugar beet, and 25 m from maize fields of conventional crop farmers. However, they agreed that GM farmers should keep larger isolation distances from organic farmers. Therefore, the distances between a GM field and an organic field should be 10 m for potato, 3 m for sugar beet, and 250 m for maize.

Compliance is guaranteed through certification and regulatory control dealing with the obligatory measures. Failure to comply will make a producer loose his good agricultural practices (GAP) certificate (and consequently his license to deliver). He/she will be liable to damage claims and will be fined by the main board of the regulatory control agency (Hoofdproductschap Akkerbouw, the

Netherlands).

The agreement further stipulates that if a grower does not adhere to the coexistence measures he can be held liable for crop damage, which may arise from the mixing of GM and non-GM crops. However, if he/she adheres to the measures he/she will be free from claims for economic damage as a result of mixing. In such case, a fund established by all relevant parties (all growers, seed firms and processing companies) will reimburse the economic damage suffered.

To date, it is not yet clear if the isolation distances are well chosen and may not change, and if there is real need for the fund. The current agreement is for three years, after which it will be evaluated and adjusted if necessary.

Conclusion

Coexistence measures should not go beyond what is necessary to ensure that adventitious presence remains below the tolerance thresholds set in the rules and legislation. They should not be an unnecessary burden on farmers irrespective of their production system. Decisions should be taken appropriately, and priority should be given to farm-specific management measures and measures aimed at coordination between neighbouring farms. *Anke van den Hurk, Plantum NL (Dutch Association for Breeding, Tissue Culture, Production and Trade of Seeds and Young Plants), P.O. Box 462,2800 AL Gouda, Vossenburchkade 68, The Netherlands; Fax: +31-182-688667; E-mail: A.vandenHurk@ plantum.nl*

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COP-8 Re-affirms Decision on GURTs

Genetic use restriction technologies (GURTs) is a broad term that refers to many forms of gene switching technology, all of which assure that a transgene is expressed only in specified conditions, such as high salinity and drought stress. This strategy can allow a plant to save energy, which it can expend on growth and seed production.

The use of GURTs was debated in the Eighth Meeting of the Parties to the Convention on Biological Diversity in March 2005. Parties agreed to re-affirm the GURTs decision, which has been in place since 2000. The decision recommends that parties do not approve products of GURTs for field testing and/or commercial use "until strictly controlled scientific assessments have been carried out in a transparent manner, and the conditions for their safe and beneficial use have been validated."

At the end of the meeting, Parties recommended, among others, that scientists "continue to undertake further research on the impacts of GURTs, including their ecological, economic, social and cultural impacts, particularly on indigenous and local communities." Thus, no moratorium on research on GURTs has been called, despite claims to the contrary.

To read more about the GURTS technology, visit: http://www.biodiv.org. *Source: CropBiotech Update 5 May 2006*

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FAO and ABSF Launch Agricultural Biotechnology Network in Africa

The Food and Agriculture Organization and the African Biotechnology Stakeholders Forum (ABSF) have launched an agricultural biotechnology network for professionals and stakeholders in Africa. The network was named Agricultural Biotechnology Network in Africa (ABNETA). It aims to build a knowledge base in plant breeding and biotechnology to facilitate access to reliable information on new technologies to improve agricultural production and reduce hunger. The network will provide a common platform and tools to share, learn, discuss, and decide agricultural matters.

ABSF will manage and coordinate ABNETA through the national coordinators, who will collate breeding and biotechnology information from both the government and private sectors. It will organize meetings, workshops, and seminars aimed at achieving the goals of the network. For more information visit the website at: http://www.abneta.org. *Source: CropBiotech Update 24 March 2006*

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ISTA Establishes GM Information Platform Website and Signs Memorandum of Understanding with FAO

GM information platform

In the last issue of *Seed Info,* we reported the ISTA accreditation of laboratories on the detection of

specified traits in GMO testing in seed lots following the ordinary meeting in April 2005, in Bangkok, Thailand. After the decision of the ISTA ordinary meeting, a new version of Chapter 8 of the ISTA Rules, including testing for specified traits, came into force on 1 February 2006. Consequently, laboratories could become ISTA accredited for testing specified traits. The first laboratories have been audited for specified trait testing.

ISTA has now finalized arrangements to set up an information platform on its website, which will provide necessary information on specified trait testing. The platform will provide a complete set of information on the requirements for becoming ISTA accredited for specified trait testing. It includes further links to technical information and databases provided by ISTA and other external sources on transgenic event descriptions, analytical methods, statistical tools, and literature. It aims to provide useful information for all laboratories on performing tests on specified traits in seeds, participating in ISTA proficiency tests on GMO testing, and willingness to become ISTA accredited for testing for specified traits in seeds. The ISTA GM information platform is a useful tool for accessing all relevant information regarding seeds and specified trait testing (https://www.seedtest.org/stream/nl-l---1--%409 fa6e911665--41.html)

It is now possible for a laboratory to become ISTA accredited for testing seeds with specified traits under the performance-based approach. The relevant ISTA accreditation documents can be down loaded from the ISTA website (http:// www.seedtest. org/en/content---1--1184.html). It includes the: (i) principles and conditions for laboratory accreditation under the performance-based approach (version 2.0), (ii) performance data evaluation for the presence of seeds with specified traits in seed lots (version 2.0), (iii) performance data evaluation for specified trait purity (version 1.0), and (iv) ISTA seed testing laboratory accreditation standard (Version 4.0).

Memorandum of Understanding

On 24 May 2006, the Vice-Director General of FAO, Dr Louise Fresco, and the President of ISTA, Ir. Pieter Oosterveld, signed a Memorandum of Understanding for cooperation in capacity building, transfer of technology, and exchange of information in all aspects of seed quality assurance between FAO and ISTA.

The importance of seed testing and seed quality assurance was brought to the attention of governments and the general public over recent years, mainly in the field of genetically modified seeds, where tremendous efforts were undertaken to install appropriate diagnostic and testing programs.

However, seed quality assurance is also an important procedure for establishing food security, especially in developing countries. In this context, analysis of the purity and germination capacity of a seed lot is a key factor. FAO and ISTA recommended that awareness of the importance of seed quality control should receive more attention.

By signing this Memorandum of Understanding both organizations (FAO and ISTA) have agreed to work together in making governments to realize the importance of seed quality assurance and control. They both aim to enhance knowledge about seed testing and seed testing facilities, particularly in countries where the seed industry is still in an early stage of development, through special training programs and projects. For more information, contact: ISTA, Zürichstrasse 50, P.O. Box 308, 8303 Bassersdorf, Switzerland; Fax: ++41-1-8386001; E-mail: ista. office@ista.ch; Website: http://www.seedtest.org. *Source: ISTA Circular 24 March 2006.*

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Sixth African Seed Trade Association Congress 2006

The African Seed Trade Association (AFSTA) is a non-profit, non-political association that represents the seed industry in Africa and the Indian Ocean islands. It has 60 members in 30 countries, with a mission to promote the development of the seed industry and the national seed associations. Their work is expected to facilitate farmers' access to improved varieties.

The 6th AFSTA Annual Congress was held on 28–31 March 2006 in Entebbe, Uganda. Some 118 delegates from 31 countries including representatives of regional and international organizations such as the Association for Strengthening Agricultural Research in Eastern and Central Africa, African Union, International

Seed Federation, International Seed Testing Association, Organization for Economic Cooperation and Development, United States Agency for International Development and West African Seed and Planting Material Network attended the congress.

Two pre-congress workshops were held: (i) ISTA-facilitated regional workshop on ISTA accreditation for governmental and seed company seed testing laboratories and (ii) Cornell University-facilitated workshop on Seed Development Program. The ISTA workshop provided useful information on the practical aspects of the accreditation of seed testing laboratories and its importance in the international seed trade. The Cornell University workshop aimed at assisting small and medium seed companies in Africa to improve their financial and managerial efficiency.

Several issues were discussed during the plenary session of the congress. A presentation was made on financing private sector investment in Africa, which highlighted lack of finance as a serious impediment to the development of agriculture in general and the seed sector in particular. A brief on Comprehensive African Agriculture Development Program (CAADP) under New Partnership for Africa's Development (NEPAD) was presented to inform the seed sector about this important program including its objectives and main components for the development of agriculture in Africa.

The presentation by Common Market for Eastern and Southern Africa gave an overview of the organization, progress made in trade capacity building for market access, and the opportunities and challenges. The presentation on facilitating access to publicly available germplasm addressed the constraints and the possible solutions in supporting the development of the seed industry. Participants discussed, among other issues, the establishment of the Foundation Seed Enterprise as a link between public plant breeding and the commercial seed companies, with a view to making available public varieties to farmers.

The presentation on the challenges of the seed market in Africa led to a lively discussion on variety release, realistic demand, seed marketing, seed price, regional seed trade barriers, plant variety protection, and biotechnology. The last presentation was on coexistence: "situation of harmonization of seed policy and regulations, including biotechnology in Africa." Representatives from the three sub-regions in sub-Saharan Africa, i.e., Southern African Development Community, Eastern and Central Africa and Western Africa, presented their achievements, followed by a discussion. The issue of coordination of actions amongst the organizations involved in the harmonization process was discussed and an agreement.

The General Assembly adopted three position papers on International Treaty on Plant Genetic Resources for Food and Agriculture, modern biotechnology and the coexistence of genetically modified and conventional seeds. The Assembly confirmed that the seventh AFSTA Annual Congress will be held in Livingstone, Zambia, on 27–30 March 2007.

AFSTA will continue to organize technical training on seeds to build the capacity of its members in 2006/07. Particularly attention will be given to seed quality assurance management, seed association management, seed marketing, and business plan. AFSTA will strive to increase its membership to increase its financial stability. It will continue to support the harmonization of the seed relation process in the sub-regions.

All the papers and materials presented at the AFSTA Congress 2006 are available on request at AFSTA Secretariat (E-mail: afsta@afsta.org). *Justin Rakotoarisaona, AFSTA, P.O. Box 2428 - 00202 KNH, Nairobi, Kenya; Fax: +254–20-2727861; E-mail: afsta@afsta.org.*

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Annual World Seed Congress

The 2006 ISF congress took place at the end of May in Copenhagen, Denmark. Some 1350 persons from 61 countries attended.

It was reiterated at the conference that the seed industry faces three major challenges, namely, intellectual property protection, adventitious presence of GM materials in non-GM seed, and phytosanitary restrictions, which acts as a barrier to trade. Since the 2005 congress in Santiago, three new countries have acceded to the UPOV Convention. With the accession of Albania, Iceland, the European Union, and over 65 member countries, UPOV has taken on a new role in the implementation of plant breeders' rights. ISF has established a working group to

draft guidelines for its members on enforcement issues.

Adventitious presence (AP) of GM materials in non-GM seed remains a concern for the industry despite some recent welcome developments. At the last meeting of parties to the Biosafety Protocol, the decision to continue using the clause "may contain" in food and feed shipments is a step in the right direction. ISF has also set up a new working group on AP in seed, which will work in parallel with other organizations such as CropLife International and BIO.

Many countries have introduced new phytosanitary regulations, which affect the international trade in seed. ISF has been actively involved in Brazil and India in talks with the government, explaining the implications of the new regulations with some encouraging results. In order to pool the experience of ISF members in dealing with phytosanitary issues, the ISF Phytosanitary Committee was working on a document aimed at helping national associations and seed companies to work more effectively with governments in facilitating the international movement of seed.

The importance of strong national seed associations was emphasized at all levels. The presence of a strong association at all three levels – national, regional, and international – is necessary if the seed industry is to be seen as an important stakeholder in matters relating to agriculture.

In addition, issues relevant to the various sections and committees, such as essential derivation, access to genetic resources and the FAO International Treaty, and renewable energy were discussed during the three days of the congress. Several amendments to the ISF trade and dispute settlement rules were adopted as were position papers on:

- use of proprietary parental lines of hybrids;
- use of DNA markers for DUS testing;
- provisional protection in UPOV Convention;
- guidelines for use of seed health testing methods.

The trading floor was, as always, very active and many contracts were signed between companies from all over the world, confirming that ISF congresses are not only important for influencing regulations at the international level but also for doing business.

Mr Deon van Rooyen, Managing Director of Pannar Seed in South Africa was elected President of ISF. He is the second president from the south in a row and the first from Africa in the long history of the organization. *Radha Ranganathan, ISF, Chemin du Reposoir 7, 1260 Nyon, Switzerland Fax: ++41-22-3654421; E-mail: r.ranganathan@worldseed.org; Website: http://www.worldseed.org*

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Iceland Accedes to UPOV Convention

From 3 April 2006, Iceland became a full member of the International Convention for the Protection of New Varieties of Plants (UPOV) by depositing the instruments of accession at the General Secretariat of the UPOV in Geneva, Switzerland. This brings the total number of UPOV members to 61. Accession to the UPOV Convention will allow Iceland to benefit from the rights conferred by the Convention, and to be recognized as a full member of the international group with clear-cut obligations and rules when it comes to plant variety rights. The UPOV Convention aims to ensure a harmonized international system for the protection of plant varieties and encourage the development of new varieties of plants. It was adopted in 1961, and has been revised three times, the most recent being in 1991. *Source:* http://www.upov.int/

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Asia Pacific Seed Association Announces Deputy Director

Mr. Kazuo Hatsuda, President of the Asia Pacific Seed Association (APSA), has announced the appointment of Dr Sampan Campiranon as Deputy Director of APSA. Dr Sampan has been widely involved in the international seed business, biotechnology, and agriculture. Dr Sampan has worked as an academic and a business executive. He will be assisting APSA Secretariat in Bangkok in achieving its goal of having a dynamic seed industry that benefits its members, the Asia Pacific region, and beyond. Dr Sampan has assumed office since 1 June 2006 and can be contacted by e-mail at: deputyd@apsaseed.com.

Beth Erlano, Managing Editor, APSA; E-mail: publications@ apsaseed.com

CONTRIBUTIONS FROM SEED PROGRAMS AND PROJECTS

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

Ethiopian Seed Enterprise Releases Maize Variety and Conducts a Training Course

Release of New Maize Variety

The Ethiopian Seed Enterprise has released the first early-maturing maize hybrid known as Toga (ESE-203). The variety is adapted to the mid altitude agro-ecological zones of Ethiopia. It matures in 137 days, earlier than the existing medium cycle varieties, which mature in 140–145 days. The variety is capable of producing yields up to 7.5 t/ha on farmers' fields in years of low rainfall. The Ethiopian Institute of Agricultural Research is responsible for overall mandate of agricultural research and variety development, while the research section of ESE is helping in national efforts to solve the problem of non-availability of adaptable maize varieties.

Training Course on Seeds

ESE organized an in-country training course on seeds in the Somali Regional State, one of the nine autonomous regions of Ethiopia. The region is characterized by arid and semi-arid climate. The majority of farmers in the area are pastoralists. Limited crop husbandry is practiced in some areas with reasonable amounts of rainfall and under irrigated conditions around perennial rivers. Agricultural productivity is hampered by poor farming practices, including the use of low quality seeds. The seed system in the region is informal and farmers do not have sufficient access to improved varieties and seeds.

In collaboration with the Somali Region Pastoral and Agro-Pastoral Research Institute (SoRPARI), ESE conducted a four-day training workshop (29 May to 1 June 2006) to initiate quality seed production with farmers. Twenty-five participants from the research institutes attended the workshop.

ESE, a public organization under the Ministry of Agriculture and Rural Development, is conducting capacity building programs to foster seed security and sustainable agricultural development in the country. It is in the process of conducting a wide ranging tailor-made training program on the improvement of farmer-based seed production scheme and revitalizing informal seed supply of local crops and varieties in Ethiopia. The program will involve a variety of national, sub-regional, and international stakeholders in seed and plant genetic resources conservation. ICARDA is a partner to Wageningen International in this program. The program will start in October 2006 with financial support from the Government of Netherlands. *Abdurahman Beshir, Ethiopian Seed Enterprise; P. O. Box 5466, Addis Ababa, Ethiopia: Fax: +251-11-6613388; E-mail: abdubeza@yahoo.com*

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SPCRI Hosts First Meeting of TCP Project for ECO Countries

The Seed and Plant Certification and Research Institute hosted the first meeting of focal points of the FAO-ECO TCP project in Karaj, Iran, on 22–24 May 2006. The Food and Agriculture Organization (FAO) and the Economic Cooperation Organization (ECO) organized the meeting. ECO was originally a tripartite organization established by Iran, Pakistan, and Turkey, but has now expanded to include Afghanistan, Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The meeting was to formally launch the project and discuss project objectives, expected outputs, and work plan with the national focal points.

The Deputy Minister and Head of the Agricultural Research and Extension Organization and the ECO Secretary General inaugurated the meeting. They emphasized the need to develop and promote the private sector and strengthen infrastructure to improve productivity. They also recommended a diversification of the production base for countries in the region to enhance competitiveness in the agricultural sector.

The meeting discussed several key issues. These include: (i) critical issues in seed supply, access, exchange, and regulation; (ii) review of the

TCP project document; (iii) key problems in regional collaboration on seed and planting material production and exchange; (iv) international collaboration in the seed sector; (v) organization of the first ECO regional seed conference; (vi) establishment of a project secretariat within ECO; and (vii) project work plan and available resources.

Thirty-two participants from the region (14) and Iran (18) attended the meeting. These included senior delegates from the governments of Afghanistan, Azerbaijan, Iran, Kazakhstan, Pakistan, Tajikistan, Turkey, and Uzbekistan (except Kyrgyzstan and Turkmenistan), as well as representatives of international and regional organizations such as ECO, FAO, and ICARDA.

There was discussion on the questionnaire developed by ICARDA and FAO to standardize the collection and analysis of data by national focal points on the national seed industry of the respective countries.

Participants of the meeting during their visit to the SPII Research Station in Karaj, Iran

The meeting endorsed the structure and composition of the project management team, which includes a Project Coordinator from ECO, a Project Co-coordinator from ICARDA and the FAO Technical Project Director. *Samad Mobasser, SPCRI, P.O. Box 31535-1516 Karaj, Iran: Fax: +98-261-2716794; E-mail: sa_mobasser@yahoo.com*

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Pakistan Tries Bt Cotton Varieties

It was rice in Iran (2004/05), and now cotton in Pakistan (2005/06), biotech crops are slowly spreading in the Central and West Asia and North Africa region. Initial planting of Bt cotton in cotton growing regions of Punjab-Bahawalpur, Multan, Muzaffer Garh, and Karor Pakka in Pakistan has resulted in increased benefits to first time growers of the GM crops. Farmers noted a reduction in the use of insecticides; 4–5 applications, compared to 6–9 in the conventional cotton varieties. Crop yields were significantly higher, with Bt cotton yielding an average of 23–28 mounds (1 mound = 40 kg) per acre versus 17–20 mounds in conventional cotton varieties.

The Pakistan Atomic Energy Commission distributed seed of Bt cotton varieties for planting in over 8,000 acres of farmland in the 2005/2006 cropping season. The Commission received special permission from the Ministry of Environment, under the 'Voluntary Code of Conduct for Release of GMO into the Environment' prepared by the National Institute for Biotechnology and Genetic Engineering to do this.

Pakistan enacted its biosafety laws in April 2005. For more information, visit http://www.pakissan.com/english/advisory/biotechnology/first.bt.cotton.grown.in.pakistan.shtml. *Source: CropBiotech Update, 17 March 2006*

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Website for Federal Seed Certification and Registration Department (FSCRD)

The first seed project in Pakistan was launched in 1973, with the assistance of FAO and the World Bank. The Seed Act of 1976 provides the regulatory framework for variety registration and release, seed quality control and certification, seed import and export, and the essential infrastructure for national and provincial seed councils and the Federal Seed Certification and Registration Department (FSCRD). The FSCRD is in the Ministry of Food, Agriculture and Livestock, and it is responsible for variety registration, seed quality assurance, and seed law enforcement.

Pakistan adopted a liberal policy and declared seed business as an industry in 1994. Consequently, the private sector was inducted and has started functioning to replace the public seed sector. The FSCRD website provides statistical information on

the performance of the seed industry and a list of companies to facilitate contact. For more information, contact Akhlaq Hussain, FSCRD, Mauve Area, G-9/4, Islamabad, Tel: +92-51-9260126; Fax: +92-51-9260234; E-mail: akhlaq7@hotmail.com; dg@pakistanseeds.gov.pk; Website: http://www.pakistanseeds.gov.pk

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Turkey Releases New Red Lentil Varieties

Lentil is an important food and feed crop in Turkey, and an important component of the farming systems. Turkey is one of the major lentil producers globally, with its South-East Anatolia Region being the most intensive lentil-growing area in the world. The region has witnessed a substantial amount of fallow replacement with lentil in the past.

Among a number of other national institutions, the South-East Anatolia Regional Agricultural Research Institute (SEARARI) in Diyarbakir, Turkey, has had strong collaboration with ICARDA in the development of red lentil varieties. Consequently, SEARARI recently released two red lentil varieties, 'Altintoprak' (ILL 7010) and 'Cagil' (ILL 7686), which were developed through cross-breeding at ICARDA and were shared with NARS through the International Nursery Network.

The Central Variety Release Committee of Turkey made the release in early 2006. There was initial selection from the International Nurseries and subsequent evaluation in a series of on-station and on-farm trials at different locations over the years, before the varieties were released for general cultivation in the vast area of South-East Anatolia.

The two improved lentil varieties are resistant to vascular wilt, a major threat to the cultivation of lentil in the region. They are medium tall (32 cm) with good standing ability, and are suitable for mechanical harvesting. They have large seeds (35–40 g/1000 seeds), and are high-yielding.

Altintoprak produced an average yield of 1.7 t/ha, while Cagil produced 1.65 t/ha during on-farm evaluation, compared to an average of 1.26 t/ha produced by local varieties. Seed multiplication and dissemination to farmers is underway. The two new lentil varieties are expected to replace the low-yielding, lodging type local varieties soon, and provide additional economic benefits to farmers. *Source: The Week at ICARDA, Issue No 926, 22 June 2006*

HOW TO

In this section we provide technical/practical information for technical staff involved in seed production and quality control.

How to No 33: Variety Maintenance in Participatory Plant Breeding

Varietal purity and identity is one of the key seed quality components in a formal seed sector. To ensure such purity, a generation system has been introduced where the variety is maintained and a breeder seed is regularly produced to initiate seed multiplication of later generations (e.g., pre-basic, basic, certified). However, deterioration in seed quality takes place at an increasing rate in a given crop with each cycle of multiplication due to genetic, mechanical, or pathological contamination irrespective of the quality of a starting material or the rate of cross pollination. No crop management practice or post-harvest technology is completely free from seed quality deterioration factors. Genetic impurities resulting from mutation, residual segregation, natural out-crossing with other crop varieties, species or wild relatives; mechanical admixtures through agricultural and processing machinery and volunteer plants of other crops and varieties and contamination with seed and/or soil-borne pests are some of the seed quality deterioration factors. Therefore, production of new breeder seed stock as source for starting new cycle of seed multiplication is necessary as long as the variety is under commercial production.

In participatory plant breeding, groups of farmer breeders are allowed to identify many varieties. The challenges for securing regular stocks of source seed, which can be used for further multiplication, become substantially greater than the capacity of individual resource-poor farmers. Therefore, a well-established formal seed system may be the most appropriate alternative to provide farmers with the variety

maintenance services directly or indirectly to the informal community-based seed system as suggested in the "How To" No. 32.

The techniques of breeder seed production vary greatly. They range from selection of seeds, heads, plants or section of field of local cultivars by farmers based on simple morphological, physiological or phenological characters to a complex progeny testing program carried out by plant breeders on pure or multi-line varieties. However, PPB varieties may lack distinctness and uniformity, which may lead to a set of different overlapping plant populations within a single variety. This is more difficult to identify or maintain than a well-defined pure or multi-line varieties. In the former case, the task of proper variety maintenance or quality seed production may be difficult, if not impossible, to accomplish by both the informal community-based or formal seed systems. In the later case where participatory plant breeding varieties are well-defined pure or multi-line cultivars, the approach of multiplying the individual isolines and bulking them based on the farmers' specific needs can be carried out as follows:

- Select 300–500 heads from cereals or single plants from legumes.
- Thresh and sow each head or plant individually in 1–2 m rows.
- Identify the major component lines based on plant characters.
- Select 20 single plants from each component line, harvest and thresh each component separately, and plant them in adjacent plots for easy comparison.
- Check carefully for homogeneity within and between the 20 individual plants in each component line and the distinctness between the major component lines throughout the second season.
- Bulk-harvest the representative plots from each component line as source seed of that particular component at the end of the second season.
- Put together all or some of the components to form a purposely structured composite variety based on the need of farmer breeders and users.

The involvement of farmer breeders is crucial for the success of source seed production for multi-line varieties from participatory plant breeding. A similar approach has been successfully applied in variety maintenance and breeder seed production of a multi-line blast resistant rice variety Sasanishiki BL in Japan (JARQ 38 (3), 149–154, 2004 http://www.jircas.affrc.go.jp). *Abdoul Aziz Niane, Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria; Fax: +963-21-2213490; E-mail: a.niane@ cgiar.org*

RESEARCH NOTES

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

Technology Transfer Strategy for Community Soybean Seed Production at Lampang, Thailand

T. Manond, S. Aemprapa, S. Sutacom[1]

Abstract

This study was conducted to transfer a technology that would help farmers to produce good quality soybean for their own use and for sale to other farmers within or outside their communities. Thirty soybean farmers were selected in six villages in Nikom-Pattana sub-district, Muang district, Lampang province, Thailand using purposive random sampling technique. The process of technology transfer consisted of: (i) establishing a soybean seed producers group, (ii) providing training courses on techniques in seed production, processing, quality testing and product promotion for marketing, and (iii) producing soybean seed under supervision by researchers. Data on income from soybean seed production was collected through formal interview using structured questionnaire and personal observations. Income per year from soybean seed production before and after technology transfer was used to evaluate the success of the project. After two years of participation in the project, farmers had established a soybean seed producers group and set up a revolving fund. During the rainy season of the first year (July to November 2002) and second year (July to November 2003), farmers had planted 60 and 159 rai (1 ha@ 6.25 rai) and

produced 13,971 kg and 39,453 kg soybean seed, respectively. The areas allocated to soybean seed production in the first and second dry years were 111 and 157 rai, respectively, producing 28,195 and 31,782 kg. After two years of the project, income from soybean production increased by 77%, which was highly significant ($p < 0.01$). The findings also indicated that success in technology transfer could be achieved through an integrated approach.

Introduction

Agriculture is the main source of economic growth and development in Thailand. The majority of people live in rural areas and engage in agriculture for their livelihoods. They produce rice, soybean, tomato, mango, rubber, etc. Soybean is one of the main crops grown by farmers in Lampang province of northern Thailand. The soybean area in the 2000/01 cropping season was 30,153 rai, with a total production of 6,196 tonnes (Office of Agricultural Economics).

Soybean is produced twice per year; during the rainy and dry seasons. Most of the soybean produced in dry season is sold for consumption. The main problem of soybean farmers in Lampang Province was lack of good quality seed. The majority of farmers do not save seed for the next cropping season, and the few farmers who do so store poor quality seed.

During the rainy season, most farmers plant other crops such as rice and vegetables, resulting to lack of good quality soybean seed for the next dry season planting. In contrast, a survey of mungbean and soybean seed in Pitsanulok Province found that the majority of soybean farmers save seed for planting the next crop or sometimes buy seed from their neighbors (Wanchai 1992). However, almost one-third of the soybean seed used for planting is of low germination. Tippawan (1998) confirmed that in Lampang Province, the most important constraints to soybean production were very low economic benefits, high production costs (e.g., fertilizer, pesticide) and lack of good quality seed, in that order.

This study was initiated to: (i) increase availability and access to good quality soybean seed in the community, (ii) enhance farmers' knowledge and skill in good quality soybean seed production, (iii) increase farmers' income from the production of soybean seed, and (iv) empower farmers to play a greater role in their own economic development.

Approaches to address lack of quality soybean seed

To increase the availability of good quality seed, group discussions wer organized with a community of soybean growers. Thirty soybean farmers were selected from six villages in Nikom-Pattana sub-district, Muang district, Lampang province in northern Thailand using purposive sampling technique (Yamane, 1967).

In 2002, a community soybean seed producers group and a pilot project was started by a researcher from the Rajamangala University of Technology Lanna (RMUTL). Selection of target group members was based on farmers who: (i) earned their living from soybean production; (ii) had their own suitable land for rainy season production, and (iii) were diligent and interested in joining the group. All activities were monitored and evaluated throughout the project. The National Center for Genetic Engineering and Biotechnology and the National Science and Technology Development Agency provided financial support for the project.

Soybean seed supply

To ensure availability and access to quality soybean seed, foundation seed of Rajamangala □ variety was provided to farmers by the researcher from RMUTL for local seed multiplication and marketing. During the rainy season of the first year, each farmer borrowed and planted the foundation seed to produce seed for sale or save for use in the next season planting. In the dry season, the seed produced were sorted into grain for consumption and seed for multiplication. The grain was sold while the seed was kept for next season planting and multiplication.

Soybean is usually planted twice a year in northern Thailand. The first crop produced during the rainy season is mostly sold for seed, while the second crop in the dry season is sold mostly for grain. Therefore, in the rainy season farmers produced soybean as seed for sale and saved seed for multiplication in the next planting season. In the dry season, they produced soybean for sale as grain and saved the seed for next season planting. This would ensure that farmers have enough good quality seed for their own use and sale to others over the two seasons every year.

A brainstorming session and problem analysis with farmers on soybean production

Technology transfer for soybean seed production

An action-oriented research was initiated as a technology transfer strategy to improve the availability of good quality seed, increase income, and improve the livelihoods of soybean farmers. The strategy includes establishing and developing soybean seed producers group and training farmers in the techniques of seed production, processing, quality testing, and product promotion. Soybean seed was produced under the supervision of researchers from RMUTL for a period of two years; August 2002 to July 2004. Annual income from soybean seed production before and after the technology transfer was used to assess the impact of the project. Data was collected from seed producers group through formal interview using structured questionnaire and personal observation. The results were analyzed using simple descriptive statistics such as percentage, mean, standard deviation, and t-test.

Characteristics of farmer group

Forty per cent of the thirty soybean growers selected for establishing seed producers group were women and the remaining 60% were men. Their average age was 48 years. Most of the farmers (90%) had formal primary education and an average of six years experience in growing soybean (range 2 to 22 years). The average farm size was 7.68 rai and the average income from soybean production was 9,145 Baht per year before the project. The majority of farmers earned their income from grain production and not seed marketing, because there was no sufficient seed for sale.

Soybean seed production and marketing

The training enhanced farmers' skills and enabled them to produce good quality soybean seed and obtain higher yields. The average quantities of seed produced over four seasons of two years was 233, 256, 261 and 204 kg/rai, respectively. The highest yield was obtained by individual farmers during the rainy season of first year (420 kg/rai) and the lowest during the dry season of the second year (43 kg/rai).

Table 1 presents the average and range of soybean yields and percentages of farmers who achieved a certain yield level. During the rainy season of first year, about 40% of farmers obtained lower than 200 kg while 33.3% produced between 200 and 300 kg and 26.7% produced over 300 kg soybean seed per rai. In the rainy season of the second year, most farmers (63.3%) obtained between 200 and 300 kg and 20% of them more than 300 kg per rai soybean seed. More farmers achieved a higher yield than in the first rainy season. The average soybean seed yield for the rainy season of the second year (261 kg rai^{-1}) was higher than first year (233 kg/rai).

Table 1. Average soybean yield and production range for dry and rainy seasons

Yield (rai/kg)	Year 1 (2002/03)		Year 2 (2003/04)	
	Rainy season (n = 30)	Dry season (n = 23)	Rainy season (n = 30)	Dry season (n = 26)
< 200	40	26.1	16.7	46.2
200–300	33.3	39.1	63.3	38.4
> 300	26.7	34.8	20.0	15.4
Average	233	256	261	204
Range	120–420	164–395	112–384	43–352

Similarly, during the dry season of the first year, 39% and 35% of farmers obtained a seed yield of 200–300 kg and over 300 kg/rai, respectively. In the dry season of the second year, however, 46% of farmers had lower than 200 kg/rai due to a drought. In comparison, the average soybean seed yield (256 kg/rai) in the dry season of the first year was higher than that of the second year (204 kg/rai).

Demonstrating soybean production technology

Table 2 presents the quantity of soybean seed produced and the proportion sold for different purposes. During the rainy season of the first year, 13,971 kg seed was produced from 60 rai (9.6 ha). Some 9,911 kg (71%) was sold for seed to generate additional income, 2,560 kg (18%) was saved as seed for the next season planting and the remaining 1,500 kg (11%) was sold for revolving fund. During the rainy season of second year, 39,453 kg soybean seed was produced on 159 rai (25.44 ha). From the total seed production, 36,441 kg (92%) was sold as seed and 3,012 kg (8%) was saved as seed for next season planting.

Similarly, in the dry season of the first year, 28,195 kg of seed was produced on 111 rai (17.76 ha). Some 12,888 kg (46%) was sold for seed production, 2,639 kg (9%) was saved as seed for the next season, and 12,668 kg (45%) was sold as grain for consumption. In the dry season of the second year, 31,782 kg of seed was produced from 155 rai (24.8 ha). About 6,219 kg (20%) was sold for seed production, 3,243 kg (10%) was saved as seed for the next season planting and 22,320 kg (70%) was sold as grain for consumption.

Table 2. Quantity of soybean seed produced and percentage sold during the rainy and dry seasons

Item	Year 1 (2002/03)		Year 2 (2003/04)	
	Rainy season	Dry season	Rainy season	Dry season
Area planted (rai)	60	111	159	155
Total seed produced (kg)	13,971	28,195	39,453	31,782
Sold as grain (%)	–	45	–	70
Sold for seed (%)	71	46	92	20
Seed saved for next season planting (%)	18	9	8	10
Seed sold for revolving fund (%)	11	–	–	–

Note: 1 ha = 6.25 rai

Quality of soybean seed produced

The Department of Agriculture (DoA) recommends that soybean seed for sale must meet a physical purity of 97% (minimum), germination capacity of 70% (minimum) and moisture content of 9% (maximum). All the soybean seed produced during the rainy and dry seasons from 2002 to 2004 met the minimum national standard (Table 3).

Table 3. Quality of soybean seed produced during 2002 to 2004 crop seasons

Year	Season	Analytical purity (%)	Moisture content (%)	Germination (%)
Year 1 (2002/03)	Rainy season	99.57	11.75	94
	Dry season	99.86	8.35	83
Year 2 (2003/04)	Rainy season	99.45	8.12	92
	Dry season	99.25	8.41	88
National standard		≥ 98	≤ 9	≥ 70

Farmers (women and men) evaluating soybean seed quality (germination)

Costs and returns from soybean production

In the past, farmers never earned any income from soybean seed production during the rainy season because production was low and not enough seed is available for sale. An analysis of costs and returns during the rainy season of 2003 showed that average total cost for soybean production was 2,470 baht/rai. With an average yield of 256 kg/rai and selling price of 17.9 baht/kg, the income from soybean seed production was 4,582 baht/rai with net return of

2,112 baht/rai (86 %) (Table 4). Farmers produced good quality seed for themselves and had extra for sale to other farmers, thus earning additional income.

The total production cost of soybean in the dry season of 2004 was 1,963 baht/rai and the average yield was 204 kg/rai. At the selling price of 15.69 baht/kg, the total income was 3,201 baht/rai with net return or profit of 1,238 baht/rai (63%) from soybean seed production. Farmers had a lower average yield in the dry season of 2004 than in the same period in 2003 due to drought, but increased price from lower global yields earned them better returns in the dry season of 2004 (Table 4).

Table 4. Soybean production costs and returns in rainy and dry seasons

Items	2003 Rainy season (n = 30)	2004 Dry season (n = 26)
	Baht	
1. Total production cost	**2,470**	**1,963**
Production cost	*768*	*869*
Seed	182	131
Fertilizer	116	337
Herbicides	169	116
Threshing	159	121
Petrol (home-farm)	32	40
Food and beverage (labor exchange)	111	124
Labor cost	*1,702*	*1,094*
Family labor (unpaid seed money)	379	494
Hired labor (paid seed money)	1,323	600
2. Average yield per rai (kg)	**256**	**204**
3. Average price per kg	**17.90**	**15.69**
4. Income per rai	**4,582**	**3,201**
5. Profit per rai	**2,112**	**1,238**
Total return (%)	**85.5**	**63.06**

Note USD 1= 42 Baht

Income from soybean seed production

The income from seed produced and seed saved for the next planting season was used to calculate the income and benefits for the farmers (Table 5). During the rainy season of 2002 (the first year), the average income from soybean seed production was 2,863 baht (USD 68) per rai with a range of 850 to 6,240 baht/rai. The majority of farmers (83.3%) had income of less than 4,000 baht/rai. In the rainy season of 2003 (the second year), the mean income was 4,582 baht (USD 109) per rai, the majority of farmers (63.3%) had income of 4,000 to 6,000 baht/rai. Income from soybean seed production varied from 2,936 to 7,070 baht/rai. Although there was wider disparity on income between the two rainy seasons, the average income from soybean seed production was higher during the second year and there was an increase in the number of farmers that received better returns compared to year 1 (Table 5).

Similarly, during the dry season of the first year (2003), the average income from soybean seed production was 2,736 baht (USD 65) per rai, ranging from 1,176 to 4,032 baht. About 47.8% of farmers had more than 3,000 baht. During the dry season of the second year (2004), the average income from soybean seed production was 3,313 baht (USD 78) per rai with a range of 640 to 5,644 baht. The majority of farmers (61.6%) had more than 3,000 baht/rai. The average income from soybean seed production was higher during the second year and there was an increase in the number of farmers receiving better returns compared to year 1 (Table 5).

Table 5. Income distribution from soybean seed production during rainy and dry seasons (n = 30)

Income class (baht/rai)	Rainy season		Income class (baht/rai)	Dry season	
	2002	2003		2003	2004
	% of farmers			% of farmers	
< 4000	83.3	26.7	< 2000	26.1	19.2
4000-6000	10.0	63.3	2000-3000	26.1	19.2
> 6000t	6.7	10.0	> 3000	47.8	61.6
Average income	2,863	4,582		2,736	3,313
Income Minimum Maximum	850 6,240	2,936 7,070		1,176 4,032	640 5,644

Comparison of farmers' income before and after the project

The t-test was used to analyze the income from soybean seed production before and after one year and two years of the technology transfer project. Income before the project (2002) was 9,145 baht, compared to 15,678 baht/rai after one year of the project. The income after one year was significantly higher than before the project and increased by 42%, which was highly significant ($p < 0.01$). A similar analysis after two years of technology transfer indicated that income (40,017 baht/rai) was significantly higher

than before the project (9,146 baht/rai) and increased by 77% ($p < 0.01$). Therefore, analysis shows that soybean farmers could develop their knowledge and skills in seed production and correspondingly increase their income as a result of the intervention.

Farmers display soybean seed at the community level

Lessons learned from soybean seed interventions

Several lessons have been learned from the study. First, researchers played a facilitating role and allowed farmers to discuss among themselves how to solve their problems and continue the seed production business. Second, the researchers motivated both men and women farmers to participate in soybean seed production including participation in planning and decision-making, implementing agricultural activities (e.g. roguing, seed quality testing, etc), and evaluating inputs and outputs and the benefits from the income. Third, the technology transfer strategy used encouraged small farmers to produce enough good quality seed for their own use and for sale to other farmers within and outside their communities.

Farmers distribute soybean seed to farmers outside their community

The following strategies were used in the study:

1. Establishment and development of soybean seed producers group. Farmers came together from six different villages to form a seed producers group and elect group leaders.
2. Provision of training courses in soybean seed production technology (planting, harvesting, cleaning, quality testing), marketing, and management. In terms of technology transfer, the researchers should identify simple or appropriate technologies to transfer.
3. Brainstorming with farmers. The researchers facilitated farmers' discussions and helped them to develop a strong group. This would help farmers to achieve their group objectives.
4. Seed production and marketing. This process enabled farmers to produce quality seed that were acceptable to their clients.
5. Follow-up and evaluation. The activity generated innovative ideas for achieving the goals of soybean seed production. Farmers had a clear picture of available alternative options and were able to switch to a suitable strategy in achieving their goals. They identified ways of improving on their past performances.
6. Linkage with local organizations. Small farmers need to be in contact with a number of formal agencies that have interest in their work. In this project, farmers maintained good relationship with the Nikom-Keawlom cooperative, which provides assistance for all their activities (processing, packaging, etc.).
7. Linkage with the community school. Farmers taught their children about soybean production skills in the school, which motivated the group and give them self-confidence, self-fulfillment, and a sense of responsibility as good models for the children. This in turn enabled them to realize their capacity.

Farmers teaching their children about seed testing

Conclusions and implications

Farmers established and developed a soybean seed producers group and set up a revolving fund for the business. They have improved their knowledge and skills in production, processing, marketing, and accounting, which is manifested in increased crop yield and income. Both men and women farmers who participated in the project can now produce good quality soybean seed with corresponding increase in income. The findings therefore indicate that success in technology transfer could be achieved through an integrated approach. The most important elements were the empowerment of farmers to solve their own problems, enhancement of self-confidence, encouragement to participate in all activities especially in planning and decision-making, implementation, equitable sharing of benefits, and monitoring and evaluation. These have consequently strengthened the farmers' group. Moreover, the increased income would enable them to stand on their own and sustain the development of their community.

Acknowledgments

The authors wish to thank the Biotec and NSTDA for providing financial support for the project. We wish to extend our appreciation to soybean farmers of Nikom-Patana sub-district for participating in the project and patiently answering responding to the questionnaire. Tippawan wishes also to express her gratitude to the manager of Nikom-Patana cooperative for his suggestions, cooperation, friendship and care during all phases of the research work.

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MEETINGS AND COURSES

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

Asian Seed Congress, 13-16 November 2006, Kula Lumpur, Malaysia. The Asian Seed Congress is the world's largest regional seed forum organized by the Asia and Pacific Seed Association (APSA). It is a congregation of seed traders, policymakers, scientists, academics, and individuals to update themselves on the latest development of the global seed business. APSA has 370 members from 38 countries.

The 2006 congress will be held on 13–16 November 2006 in Kuala Lumpur, Malaysia. For further information, please contact: APSA Secretariat, P.O. Box 1030, Kasetsart Post Office Bangkok 10903, Thailand; Fax: +66-2-940-5467; E-mail: apsa@apsaseed.com; Website: http://www. apsaseed.com

28th ISTA Congress, 5–11 May 2007, Iguassu Falls, Brazil. In connection with the 28th ISTA Congress, a Seed Symposium will be held on 7–9 May 2007. This is a second call for papers for the symposium under the theme *Diversity in Seed Technology*. Papers should be submitted online only

(http://www.seedtest.org /en/abstractpaper-submission.html) as an abstract of 1600 characters (maximum). Papers will be presented orally and as posters, both forms having equal status. The selection of papers for oral presentation will be made by the Scientific Programme Advisory Committee. For more information, visit the website or contact: International Seed Testing Association, Zurichstrasse 50, 8303 Basserdorf, Switzerland; Fax: ++41-44-8386001; E-mail: seedsymposium@ista.ch; Website: http://www.seedtest.org

Courses

Plant Genetic Resources and Seeds: Policies, Conservation, and Use, 4–22 November 2006, Karaj, Iran. The national agricultural research systems require technical capacity and expertise to strengthen and implement an effective agrobiodiversity conservation, germplasm enhancement and use and competitive national seed sector to ensure the delivery of improved varieties and good quality seed to the farming communities. This course aims at improving the capability of national staff in agrobiodiversity conservation, plant genetic resources policy and alternative seed delivery systems. Participants of the course are expected to put theory into practice in their own countries.

The course is organized as a joint activity of the NARS of Iran, particularly the Seed and Plant Certification and Registration Institute, Seed and Plant Improvement Institute, ICARDA, Generation Challenge Program and Wageningen International (ex IAC). It is scheduled to hold from 4 to 22 November 2006 at the training centre of the SPCRI in Karaj, Iran. We envision a total of 25–30 participants (15–20 per course). The program consists of three courses that together make up a three-week training program. Participants can join one, two or all three courses.

Week 1 (4–8 November 2006): Ex situ and in situ conservation of agrobiodiversity. Contact person: Dr Ahmed Amri (ICARDA); E-mail: a.amri@cgiar.org

Week 2 (11–15 November 2006): Small scale seed enterprise development and support of local seed supply. Contact person: Dr Zewdie Bishaw (ICARDA); E-mail: z.bishaw@cgiar.org

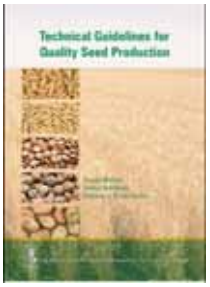
Week 3 (18–22 November 2006): Genetic resource policies and freedom-to-operate practice. Contact persons: Dr Niels Louwaars (WI); E-mail: n.louwaars@wur.nl

For further information on the program please visit the websites of ICARDA: www.icarda.org (see: Announcements), Wageningen International: www.wi.wur.nl (see: international education at Wageningen UR, courses), or the Generation Challenge Program: www.generationcp.org (see: capacity building corner, training courses).

The admission deadline for application is **15 September 2006**. Early application is recommended. Further information and application forms can be downloaded from the website of Wageningen International, ICARDA and the GCP; see the addresses below. Application forms, including a separate CV, should be submitted to Wageningen International by e-mail to: training.wi@wur.nl

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*.



Bishaw, Zewdie, Abdoul Aziz Niane, Anthony J. G. van Gastel. 2006. Technical Guidelines for Quality Seed Production, ICARDA, Aleppo, Syria. This is a recent publication by the Seed Unit of ICARDA. The guideline is prepared to assist farmers operating village-based seed enterprises (VBSEs) with on-farm quality seed production and marketing. The manual would also be useful to extension agents and staff of agricultural development agencies and NGOs who are supporting local seed production actvities. The gudieline focuses on general principles, however, where necessary specific examples have been drawn to explain the details. If you would like to have a copy of the guideline please write to: Seed Unit, ICARDA, P.O. Box

5466, Aleppo, Syria; Fax: +963-21-2213490; E-mail: z.bishaw@cgair.org

Sperling, L. and T. Remington. Seed Aid for Seed Security: Advice for Practitioners. These are ten *Briefs* that offer advice on how to sustain and strengthen seed systems during disaster response and recovery periods. This up-to-date technical information addresses issues such as introducing new varieties, protecting agrobiodiversity, and exploiting market opportunities during periods of acute and chronic stress. Specific aid-response tools are also offered, including methods for assessing seed system security, guidelines for learning-focused evaluations, and checklists to ensure quality in seed-aid proposal development. The briefs were prepared by Louise Sperling from the International Centre for Tropical Agriculture and Tom Remington of Catholic Relief Services, with CARE–Norway. To download, visit: http://www.ciat.cgiar.org/africa/practice_briefs.htm

Jones, S., J. Taylor and F. Ash. Seed Identification Handbook: Agriculture, Horticulture and Weeds, 2nd Edition. The publication has pictures of some 200 crops and weed species in the UK, of which many species are also found worldwide. It is a useful tool for seed analysts, biologists and plant physiologists. Information on each species comprises a magnified color photograph of the seeds, two or three sentences giving some background and a description of seed shape, size and color. A white inset 10 mm in diameter within each photograph provides life-size silhouettes of the seeds to aid identification. The arrangement of species is alphabetical within families. Six pages of life-size silhouettes then follow in order of ascending size. The handbook concludes with an index of botanical names (following ISTA List of Stabilized Plant Names 2001), an index of (UK) common names, a substantial bibliography and reference list, and a few relevant websites. NIAB, Price: £35; 94 pp; Website: http://www.niab.com.

Smale, M. (ed.). 2005. Valuing Crop Biodiversity: On-farm Genetic Resources and Economic Change. A collection of essays, the book explores issues of crop diversity as an essential tool in combating pests, diseases and changes in climate, all risk factors in any agricultural system. Crop biodiversity also underpins a range of dietary needs and services that consumers may demand as economies change, within a rapidly changing global food system. Genetic resources are vulnerable assets, susceptible to disruptions caused by drought, floods and wars. Social and economic changes can also have negative consequences, leading to growing concern about the declining diversity of crop genetic resources.

The book assembles a set of empirical case studies conducted in the field and addresses farmer preferences, farmers' demand for biodiversity, social institutions, and seed systems. Aimed primarily at researchers, the collection is intended to show the practical meaning of crop biodiversity, its value and how it can be supported by policy and development strategies. Key issues are well-illustrated with tables or diagrams and useful headings define key issues and breakdown complex information. CABI Publishing, ISBN 0 85199 083 5 (Hb); Price: £60; 336pp; Website: http://www.cabi-publishing.org

Gelb, E. and A Offer (eds.). ICT in Agriculture: Perspectives of technological innovation. What is the role of information and communication technologies (ICTs) in improving the lives of rural communities in the developing world? Provision of information and training materials are obviously a key area, but there are many more, for example, improving access to financial services and rural credit, and enabling more reliable systems of land registration. By enabling two-way communication, ICTs have the potential to raise the voice of rural communities in the sphere of policymaking and regulation. Many of the papers in this e-book focus on technologies that target specific sectors of agriculture: dairy farming, horticulture, precision agriculture, and irrigation management. However, for most rural communities in the developing world the basic ICTs are the priority. Papers can be downloaded free from: http://departments.agri.huji.ac.il/economis/gelb-main.html

Journals

Plant Genetic Resources: Characterization and Utilization was initiated in April 2003, as successor to the long-running journal *Plant, Varieties and Seeds*. The journal provides a forum for describing the application of novel genomic technologies, as

well as their integration with established techniques, targeted towards the understanding of the genetic variation captured in both *in situ* and *ex situ* collections of crop and non-crop plants; and for the airing of wider issues relevant to plant germplasm conservation and utilization. Multi-disciplinary approaches that incorporate both technical and socio-economic focus are particularly welcome.

Useful Internet Websites

Bread Wheat Landrace Website. While there is a multitude of high-yielding modern crop varieties in use today, the work of plant breeders is by no means finished. A variety that is successful today can overnight be rendered ineffective by changes in the agro-ecosystem. One source of genes that can be utilized to meet these constantly emerging challenges to food production is the ancient farmer varieties.

To support this process, seeds of a whole range of farmer varieties, or landraces, have been assembled in a worldwide network of genebanks. The N.I. Vavilov Research Institute of Plant Industry (VIR), the International Center for Agricultural Research in the Dry Areas (ICARDA) and the Australian Winter Cereals Collection (AWCC), house an impressive collection of over 17,000 bread wheat landraces from diverse environments to which they were adapted.

To facilitate access to this information, a web database was developed that allows the user to efficiently query the data associated with this collection, and provide the capacity to identify custom subsets of accessions with single and multiple trait(s) that may be of importance to breeding programs. This information package can be used as a powerful tool to enhance the effectiveness and efficiency of identifying raw material to screen for developing improved varieties.

The accessions detailed by this database are of particular importance to the breeding programs of the CWANA region, because a large proportion of them were collected in the region, many of which would no longer be available in the field.

The site was developed through a collaboration between ICARDA, VIR, and the AWCC, with funding from the Grains Research and Development Corporation. Visit the website at: http://www. bwldb.net. For more information contact: K. Street, GRU, ICARDA, P.O. Box 5466, Aleppo, Syria; E-mail: k.street@cgiar.org.

MaizeLink: A New Web Portal of Agricultural Experts. The Raizada Laboratory, University of Guelph, has established MaizeLink, a global online community that permits maize researchers and their expertise to be found rapidly. The portal will also provide free websites and access to open-source databases and journals. Visit the MaizeLink website at: http://www.maizelink.org.

A Resource on Sorghum and Millet. The Interactive Resource Center: Resources for Sorghum and Millet researchers, supported by the Syngenta Foundation, has recent scientific publications, genetic maps, and data on sorghum and millet. For more information, visit: http://irc.igd.cornell.edu/SorghumMillet/SorghumResources.html.

African Crops News Service

The African Crops News Service covers current research and developments in the improvement of African crops and seed systems. The service compliments the africancrops.net website to enhance the sharing of news and information from projects supported by The Rockefeller Foundation and other organizations. Read more on the African Crops News Service at http://africancrops.net/news/

PRELIMINARY ANNOUNCEMENT

Second International Seed Trade Conference 2007 in CWANA Region (2nd ISTC2007)

After a successful First International Seed Trade Conference, held in November 2005 in Antalya, Turkey, the National Seed Council of Egypt, the Turkish Seed Industry Association (TURKTED) and the International Center for Agricultural in the Dry Areas (ICARDA) announce the Second International Seed Trade Conference 2007 in CWANA Region to be held in October 2007 in Cairo, Egypt.

The second international seed trade conference aims at promoting seed trade within and between Central Asia, West Asia and North Africa (CWANA) and the rest of the world. The conference will not only provide opportunities for seed trade, but also contribute to the dialogue between the private and public sector regarding harmonization of regulatory frameworks to promote seed trade in the region. A major focus of the conference will be the trade exhibitions by seed companies, seed equipment manufacturers, agricultural input supply companies, and agricultural machinery manufacturers. Companies interested in participating in the conference or exhibition of products should contact the conference secretariat.

The Conference will overlap with the Cairo Agricultural Fair, an international exhibition of agriculture, horticulture, and floriculture held each year.

Venue of the Conference

Cairo is the jewel of the orient, and a melting pot of ancient and modern Egyptian civilizations. It lies at the centre of all routes leading to, and from the three continents: Asia, Africa and Europe. The city is mild and dry in winter. For more information about Cairo, visit http://ce.eng.usf.edu/pharos/cairo/tourist/general.html

Information on the conference

More information on the conference will be provided at http://www.icarda.cgiar.org/ and http://www.seedcouncil.eg/ very soon.