



SEED INFO

Official Newsletter of the WANA Seed Network



Seed Info No. 23

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EDITORIAL NOTE

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

In the last few issues of *Seed Info* we covered several topical issues related to biotechnology, GMOs, plant variety protection and biodiversity. In this issue we shift our focus and introduce a new topic on setting up a new enterprise in the seed sector. Peter Witthaut, GTZ Financial Advisor formerly of GTZ Seed Project in Egypt and currently based in Nigeria writes about the legal considerations in establishing small seed enterprises. In *Seed Info* No 22 Michael Turner introduced some of the recent developments in Africa aimed at harmonizing seed regulations and promoting regional trade in seeds. In this issue Edward D. Zulu from South Africa Development Community (SADC) Seed Security Network will present a detailed account of one of the regional initiatives in Southern Africa. There is also news from international organizations such as International Union for the Protection of New Varieties of Plants (UPOV), International Seed Federation (ISF), International Seed Testing Association (ISTA) and the African Seed Trade Association (AFSTA).

The section on SEED PROGRAMS includes news from Afghanistan, Morocco, Pakistan and Syria. We report on the efforts of the Future Harvest Consortium to Rebuild Agriculture in Afghanistan (FHCRAA) which is spearheaded by ICARDA as a lead Center covering short-term and long-term

initiatives undertaken to rehabilitate the agricultural sector in general and the seed sector in particular. The report includes all activities undertaken since the first stakeholders meeting in Tashkent in January 2002 including relief seed supply for spring planting in April, Code of Conduct workshop in May, rehabilitation of infrastructure and human resource development in the seed sector. There is a brief note on the performance of the seed sector in Pakistan.

In the HOW TO section, your regular contributor, Abdoul Aziz Niane once again explains the ISTA Quality Assurance program describing the essence of ISTA Seed Testing Laboratory Accreditation Program. This time we will focus on developing a Quality Manual for seed testing laboratories.

From the outset maximum lot size remains the basic requirements for seed lots to issue ISTA International Seed Lot Certificate. Maximum lot size for each crop species is defined taking into account the specific properties of seed and conditions for seed trade. Since the conditions for seed trade change over time, ISTA maximum lot size is also revised periodically, but remains as part of ISTA sampling system. Once again changing the seed lot size is under intense discussion in international forum. The RESEARCH section highlights the position of ISTA on maximum seed lot size.

For an electronic version of *Seed Info* visit the website at <http://www.icarda.cgiar.org>

We wish you an enjoyable read.

Zewdie Bishaw, Editor

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WANA SEED NETWORK NEWS

This section presents information related to the WANA Seed Network. It regularly updates the progress of Network activities and reports on the meetings of Steering Committee and WANA Seed Council.

Network Publications

The revision of three Network publications namely; WANA Variety Catalogue, WANA Field and Seed Standards Catalogue and WANA Seed Directory is now completed and expected to be published in 2002.

The WANA catalogue of standards includes field and seed standards which are used for certification of most important agricultural and horticultural crops in member countries. The document now includes standards for cereals, legumes, oilseeds, industrial crops (cotton, sugar beet), forage crops and some horticultural crops (beans, cabbage, carrot, cucumber, egg plant, onion, potato, pepper, tomato, water melon). An AOSCA scheme used for varietal certification in Canada and USA and a proposal developed by FAO for *Quality Declared Seed* are included for selected crops to enable comparisons among different systems.

The WANA Catalogue of Crop Varieties compiles information on crop varieties (and their synonyms) as well as breeders/maintainers of varieties grown in the WANA region. This document is a revised version of 1998 and covers varieties of cereals, legumes, oilseeds and forage crops currently released and under commercial seed production.

The WANA Seed Directory lists public and private organizations involved in the seed sector of the member countries as a source of reference and to facilitate communication. The present document includes lists of public and private institutions as well as managers and specialists in the seed sector from 15 countries.

Change of Network Representative

Mr Yasir Momany from the National Center for Agricultural Research and Technology Transfer (NCARTT), Ministry of Agriculture has replaced Mr Hussein Saleh who served as the Country Representative of Jordan to the WANA Seed Network since 1995. We would like to thank Mr Saleh for his valuable contribution to the Network during his term as representative of Jordan. We also would like to welcome Mr Momany as a new Country Representative and look forward to his

contribution to the objectives of the Network. His contact address is: Mr Yasir Momany, National Center for Agricultural Research and Technology Transfer (NCARTT), P.O Box 639, Baqa' 19381, Jordan; Tel: ++962-6-4725411, 4725461; Fax: ++962-6-4726099; Website: <http://www.ncartt.gov.jo>

New E-mail Address for GOSM

The Syria Country Representative to the WANA Seed Network has informed us that the General Organization for Seed Multiplication (GOSM) has an e-mail address which we believe will facilitate easier communication among Network members and observers. Syria is responsible for preparing the WANA Catalogue of Field and Seed Standards, which is being completed. The full contact address is: General Organization for Seed Multiplication, P.O. Box 5857, Aleppo, Syria. Tel: ++963-21-4644902; Fax: ++963-21-4644901; E-mail: gosm@mail.sy

Change at the Network Secretariat

Dr A.J. G. van Gastel joined ICARDA from March 2002 as the Head of the Seed Unit after six years leading the IITA/GTZ Seed Production and Marketing Project based in Ghana. Dr Michael Turner left ICARDA in 2002 and is currently working as Visiting Professor at the Seed Science Center of Iowa University starting from May 2002.

NEWS and VIEWS

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

Legal Considerations in Establishing Small Seed Enterprises

In setting up a new seed enterprise the first step is to complete the necessary market research and prepare a business plan. Then it is essential to look at the legalities required when setting up your business.

Starting a business must not only take into account economic, financial and marketing factors. It must also consider the legal status of the business, in order to protect the owner's capital and investment. In most countries there are different types of legal structures of enterprises; these are usually defined in the Company Law. The condition under which a seed business manages and conducts its affairs, borrows money, and generates or disseminates

financial information is determined by the legal status of the business. There are two major legal frameworks for private persons who form a business for profit: *partnerships* and *companies*.

A partnership law is based on contract and is only suitable for a relatively small number of persons who know and trust each other. Company law allows establishing companies, *i.e.*, associations with a legal personality, distinct from that of their members.

Choosing the most suitable legal framework for a small seed enterprise depends on a number of factors, mainly:

- *Amount of capital* needed to start the business: Considering the investment in equipment and infrastructure, sources of finance must be available and secured. Financing the required working capital to start the business is another important issue to be considered.
- *Financial risk* involved: If a venture is risky spreading the chances for financial failure is required.

A 'one-person' business could be a 'sole trader' (*i.e.*, self employed) or a 'limited company'. When several 'persons' are involved, it could be a 'partnership', 'limited company' or 'cooperative'.

Sole Trader

This is probably the most common form when a new business is started. The owner may trade under his own name or a business name, which usually does not have to be registered. In case a business name is used, the owner's name should appear on all letterheads, etc. The owner of the business solely holds all profits (and losses), and is fully responsible for the business. He may decide to employ people to work for him or to manage the business for him, but they will remain employees and he has final responsibility.

When starting the business, finance must be provided. If your own savings are not sufficient, you may borrow money. Banks and other financial institutions usually require detailed plans of the proposed business (Business Plan). If the business runs into financial problems, you will be personally responsible for paying the debts, even if this means selling your house, car, etc. A sole trader has very few legal requirements to fulfil. If the value of the taxable supplies (per annum) is over a certain sum, the business must be registered with the Tax Authorities (depending on tax laws of the country) and is legally required to maintain accurate records. To assure that the correct amount of tax is paid, proper accounting records must be kept. Generally,

taxes are paid only on profit. The sole trader may well be interested in the amount of profit the business made in the year, but there is no legal requirement to produce a statement showing this.

Partnership

A partnership is when two or more people carrying out a business for profit. There is a limit on the number of partners, which should not exceed 20, but this depends on the legislation of the country. The partners are all owners of the business, and jointly make decisions on running the business. They may operate under a business name, which does not have to be registered. Depending on the legal requirements, the names of the partners may have to appear on the firm's stationery.

It may be easier for a partnership to raise the funds to start a business (sharing the investment). All partners will share any profit, and share any losses. Partners normally ask a solicitor (attorney at law) to draw up a legal agreement showing the proportions in which they share profit or loss and other matters.

If partners invest different amounts of capital, they can choose to either: (1) apportion the profits in the same ratio as the amounts invested, or (2) to allow time, say six months, for the partners to equalize their investments. In both cases, voting rights should be equal to the amount of individual investment.

Partners are personally responsible for the debts of the business, but if one partner disappears, the remaining partner(s) is/are liable for all the debts. Requirements listed above on tax and financial statements for sole traders are similar for partnerships. In addition, your country may have a Partnership Act, which lays down the following:

- Proper books of account must be kept
- Capital must be distinguished from profits and losses
- A record must be kept of profit shares and withdrawals
- Partners are bound to render true accounts and full information of all things affecting the business to a partner or his legal representative

Limited Liability Company

Unlike a sole trader, a limited liability company is a legal entity in its own right. The most important feature is that the company *only* is held responsible for the debts incurred in trading. If the company is unable to pay its debts, then the company can be sued in its own name. The owners (shareholders) are responsible for the amount of money they have

invested in the company, but their liability is limited to that amount. Their personal assets are not subject to takeover. Therefore, a number of legal requirements are facing a limited company.

Its shareholders and directors may change, but the company will continue to exist until legally disbanded. If the company is unable to pay its debts, then it may go into liquidation. Countries have many laws to regulate them. No one should set up a company without understanding the implications and getting professional advice.

A company must have at least one director and a company secretary who could be a second director, another shareholder or accountant or solicitor. In forming a company, certain documents (articles of association, memorandum of association) and the name of the business must be registered with the Registrar of Companies. In addition, every year a limited company must send certain financial information to all shareholders and to the Registrar. As any person may consult the files of the Registrar, the information submitted by the company become public documents.

Companies limited by shares are the most important form of business organization, not because of their number, but because of their size. Companies whose shares can be offered to the public are known as public limited companies (plc) and these words must appear after the name. There are also private limited companies whose shares may not be offered to the public, and in most cases the founders and owners hold all shares (limited must appear after the name).

A public company can offer its shares to the public through the stock exchange; a private company cannot do this. Legal reporting requirements for limited companies are complex; these are contained in the Company's Act. These vary, depending on the type of company and its size, but general provisions are:

1. Accounting records must be kept to show and explain the company's transactions
2. At the end of each financial year, accounts must be prepared which comprise: (a) profit and loss account, (b) balance sheet, (c) auditor's report, and (d) director's report

These accounts are given to each shareholder, debenture holder, and any other person entitled to attend the Annual General Meeting. These should also be filed with the Registrar of Companies. In this way they become public documents; for a small fee, anyone can obtain a copy of them.

Furthermore, there are certain accounting standards (national and international), which are guidelines

issued by the professional accounting body in your country. These standards do not have the force of law, but are guidelines as to how certain accounting matters should be dealt with by limited companies.

Cooperative

A cooperative or 'worker's cooperative' is a specialized form of limited company. Cooperatives are run like any other small business with managers or supervisors, the difference being that the business is owned by everyone who works in it and decisions are made democratically. Laws and regulations apply to a cooperative are the same as for a limited company. *Peter Witthaut, c/o German Development Cooperation (GTZ), P. O. Box 56106 Lagos, Nigeria, Fax: ++871-761625841; Email: gtz-klfpp@t-online.*

Harmonization of Seed Regulations in Africa: The SADC Seed Initiative

Most countries in Africa have established crop variety development programs and established seed delivery systems. Most of these organizations are public sector and are often inefficient and unable to meet national seed demand in their respective countries.

A number of initiatives are currently underway across various sub-regions of Africa to harmonize seed policies and regulations. The objectives of the initiatives are to facilitate:

- Easier movement of seed and germplasm across national boundaries
- Creation of regional seed markets, leading to economies of scale
- Increased investment by private and public entities
- Improved services to farmers for increased productivity in agriculture

The SADC Seed Initiative

The Southern Africa Development Community (SADC) comprises 14 member countries; Angola, Botswana, Congo, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. Together, they cover a total area of 9, 277 million ha with a population of 195 million people. The countries are bound by the Declaration and Treaty of SADC launched at a Summit in August 1992 in Windhoek, Namibia. The theme was towards economic integration to stimulate regional trade and cross border investment for the benefits of the region.

Harmonization of Seed Rules and Regulations

The seed industries in the region differ a great deal. While some countries within the region have well developed seed industries backed with legislation consistent with current liberalization policies others are still in their development stage. Some countries have seed Acts and their attendant regulations and have capacity to enforce them, others do not have or may have them but lack the capacity to enforce it.

The system of certification also varies and this causes problem especially with the nomenclature that is being used. Some countries are members of International Seed Testing Association (Malawi, South Africa, Zimbabwe and Zambia) and others are not and acceptance of seed from one country by the other is generally a problem.

Although SADC is becoming a common market in line with the Declaration and Treaty, the seed regulations are not yet harmonized. It is still difficult to trade freely among member states. Seed systems remain user unfriendly, time consuming and complicated.

Efforts to Achieve Harmonization of Seed Regulations

Efforts of harmonization of seed rules and regulation in the region gained momentum in 1994 when the Common Wealth Foundation supported the recruitment of two international consultants to collect information on seed situation in the region. This culminated into the convening of a regional workshop that was held in Harare, Zimbabwe in 1994. The participants agreed in principle that harmonization of seed regulations needed further discussions, but felt that any future studies include national consultants who better understand the situation in the region.

In November 1999 SADC mobilized some funds with the support of Belgium Technical Assistance to convene a regional meeting. This meeting identified specific areas to be addressed on issues of harmonization of seed rules and regulations including common variety list, regional referee seed testing, seed certification scheme and seed trade regulations to ease seed movements across borders.

The Sub-Saharan Africa Seed Initiative (SSASI)

Early in 2000, the World Bank was concerned that there was little impact being made on the investment in crop improvement in Sub-Saharan Africa due to inadequate seed delivery systems including policy and regulatory restrictions.

Through the Sub-Saharan Africa Seed Initiative (SSASI) the African stakeholders and the World Bank agreed to establish efficient and sustainable seed delivery systems that provide reliable supply and choice of quality seed. Importantly, SSASI was also to promote a regionally coordinated, country-driven process of policy review, institutional strengthening, and innovation to foster amongst other issues the harmonization of relevant seed policies across countries to bring about competitive and larger market place for seed trade. It encourages seed systems to be deregulated, integrated and made more market-oriented.

The Action Plan in Southern Africa

The Action Plan for Southern Africa was formulated to address the above issues in the SADC region first starting with four pilot countries namely; Malawi, Mozambique, Zambia, and Zimbabwe. It is envisaged that more countries would be included in a second phase, building on the strengths and lessons learnt.

The World Bank coordinated the Plan with financial support from the Danish International Development Agency (DANIDA), GTZ Supported Small Scale Seed Production by Self Help Groups Project (based in Zimbabwe), and the Bank's own resources and is being implemented in consultation with seed sector stakeholders in the four pilot countries.

The Action Plan Process

In the absence of a regional seed specific institution within SADC, the World Bank engaged COWI Consulting Engineers of Denmark to provide technical assistance and the Seed Control and Certification Institute (SCCI) of Zambia to provide sub-regional coordination.

A start-up workshop was held in Lusaka, Zambia in February 2000 with participants including representatives from public and private seed sector, COWI Consultants, World Bank, SADC and USAID. The workshop endorsed the Action Plan, and decided the following steps to implement it:

- The identification of Focal Points in member countries to provide national coordination. The SCCI in Zambia provided regional coordination and Secretariat of the Action Plan.
- After the workshop, the consultant from COWI and the Coordinator from SCCI made visits to all four countries, meeting more stakeholders and explaining the process, establishing contacts and seeking support.

- The preparation of national seed sector compendia by local consultants following consultations with national stakeholders. The compendia described national seed industries in great detail highlighting the status, strengths, weaknesses and opportunities for further development.
- The national seed compendia were presented by local consultants and discussed at high-level national workshops comprising public and private research, seed companies, quarantine, extension, NGOs and donors.
- In preparation of these workshops and to verify the content of the seed compendia, local stakeholders were further interviewed on current issues and the potential for improvements in seed supply systems.
- Considering the outcome of the interviews and the workshop recommendations a Status and Opportunity Report for each country was prepared. These reports describe current institutional and regulatory arrangements and summarize workshop recommendations concerning the possibilities for strengthening of the seed systems and for regional harmonization of regulations.
- Based on the analysis of the four Status and Opportunity Reports, a Regional Strategy Document was prepared and discussed at a regional workshop by stakeholders, which included stakeholders from the four countries and the remaining 11 countries as observers.
- During the whole process the Coordinator provided progress reports every month to the relevant stakeholders at national and regional level to keep them informed of the progress being made to the Action Plan. The SADC Seed Security Network has now taken up this coordination role.

The regional workshop was held in September 2001. It was organized by the SADC Seed Security Network and funded by the French Government through FAO. The workshop endorsed the need to move forward to implement the specific areas that were agreed for harmonization at the four national workshops and the regional workshop which included:

- Formulation of common registration and release procedures of varieties
- Collaboration and harmonization in seed testing
- Collaboration in seed certification including nomenclature
- Simplifying plant quarantine regulations

The Way Forward

The workshop recommended that specific technical working committees be formed to look at those

specific areas for harmonization that have been agreed. The stakeholders agreed that it was time to implement what had been agreed.

The process is now at a stage where funding is being sought to put in place technical committees to work out the mechanisms. When that is completed, it is expected to receive an automatic approval from the political leadership, as the issues are part of the wider vision of SADC. The current bottleneck and determinant of when this process will end depends on the financial good will the region might receive.

Conclusions and Lessons Learnt

Efforts on harmonization of seed rules and regulations in the SADC region have been slow. At the same time it is not an easy subject to be concluded especially with the current differences that exist within member countries and the lack of the much needed funding for such an activity. The meetings that have taken place in the past have offered an opportunity to stakeholders to appreciate the problems associated with seed trade in the region. They also provided an opportunity for regional stakeholders to know each other and share experiences thereby creating more confidence to the process of change.

Some of the reasons that have contributed to the slow pace of harmonization include:

- Lack of understanding initially by stakeholders particularly from seed certification institutions on the need and the benefits that can accrue from harmonization. This has now been overcome through the process of continuous consultations and dialogue.
- Fragmented and un-coordinated donor efforts, each with a different approach or agenda to the process of harmonization.
- Lack of regional institution responsible for seeds, which also contribute to fragmentation of donor support and lack of follow up on agreed concrete issues. This has currently been addressed with the setting up of the SADC Seed Security Network, unfortunately whose continued existence is threatened for lack of funds.
- Funding to implement the already agreed areas of harmonization has been a real bottleneck. Currently the process is on hold due to lack of funding to proceed with implementation.

The Declaration and Treaty of the Southern Africa Community (SADC) and especially the protocol on trade has provided enough frameworks in which to move forward on harmonization of seed regulations. Currently, therefore it is not an issue for debate as to whether we need to harmonize seed regulations or

not. What is at stake now is to seek solutions on the issues identified. The region should continue to source funds to implement the issues identified. *Edward Zulu, SADC Seed Security Network, P. O. Box 4046, 43 Robson Manyika Avenue, Harare, Zimbabwe; E-mail: ezulu@fanr-sadc.co.zw*

The African Seed Trade Association's Position on Biotechnology

The African Seed Trade Association (AFSTA) recognizes the importance of modern biotechnology as an efficient tool in enhancing food production and agricultural development in Africa, in combination with other existing and new technologies. Agriculture will remain a key area in uplifting the socio-economic conditions in view of its average contribution of 70% to national economies.

Modern biotechnology has made possible significant crop improvements such as pest and disease resistant varieties and improved quality food and development of a number of new varieties widely grown in both developed and developing countries. Africa loses an estimated 40% of its grain crops due to pest, disease and weed damage in the field and post harvest losses. It clearly stands to benefit from adoption of new unique traits, which have already proved their worth in 52 million ha globally.

By means of Modern Biotechnology, Africa will be able to develop superior varieties that can perform well under the severe biotic and abiotic stresses that are extremely detrimental to the African agriculture and at the same time produce better quality food and feed. Indeed, the African continent has real need to increase food production efficiency per hectare for its fast growing population, thereby also contributing to reducing deforestation and environmental degradation. Therefore,

- AFSTA encourages and supports research and applications of agricultural biotechnology to improve agricultural productivity.
- AFSTA urges all African stakeholders, both public and private, to actively participate in worldwide debates on the safe use of agricultural biotechnology.
- AFSTA affirms that appropriate policies and programs must be developed to foster rapid developments in agricultural biotechnology in order to ensure a safe and sufficient supply of food, which will ultimately raise African farmers' standard of living.
- AFSTA recommends that adequate regulations and proper scientific protocols must be

established as a priority to assess on scientific basis and allowing for African level and existing conditions, possible health and other environmental risks to ensure Safe Modern Biotechnology in Africa. However AFSTA considers that there are no specific risks inherent to modern biotechnology and that the safety assessment has to be made on a product-by-product basis. A prerequisite is to enact biosafety regulatory systems required under the Cartagena Biosafety Protocol in such a manner that these systems are practical, enforceable and affordable.

- Considering the economic situation in Africa in general and the level of materials and equipment required to properly conduct modern biotechnology, African countries need help to build capacity for developing and assessing the safety of new transgenic crops. AFSTA appeals to both multilateral development organizations and foreign aid donors to assist in strengthening African countries in several aspects such as education of the stakeholders regarding opportunities, as well as the possible associated risks, suitable regulatory protocols, promotion of entrepreneurship and local private sector participation, research infrastructure, special program for tropical plants, etc. It is especially urgent to build capacity within national regulatory authorities so as to ensure adequate regulatory oversight.
- AFSTA is willing to cooperate with international organizations dealing with agricultural biotechnology and participate in any debates by providing the practical expertise of its members on the subject.

The ISTA Quality Assurance Program: Accreditation Procedures in Six Steps

ISTA requires that its member laboratories wishing to issue ISTA Certificates should fulfil the ISTA Accreditation Standard. The quality assurance program of the laboratory should be assessed on-site by two ISTA auditors. The following six steps explain the procedure for laboratories interested to get ISTA Accreditation:

1. ISTA Membership

Laboratories intending to become accredited have to become ISTA member first. They should contact the ISTA Secretariat for the necessary application forms and complete the form (Form D) available from the Secretariat. The ISTA Executive Committee will then decide about the application and grant membership.

2. Participation in ISTA Proficiency Testing Program

All accredited laboratories and those interested to be accredited have to participate successfully in the ISTA Inter-laboratory Proficiency Testing Program, consisting of at least three referee test rounds per year. Seed samples of known quality are sent to the laboratories to carry out the examination according to the ISTA Rules. The results have to be reported within a three months period. The results are then statistically analysed. The participating laboratories get a detailed evaluation sheet that shows their performance. In case results are out of tolerance, the participating laboratory gets a test leader report advising possible corrective actions to take to enhance the laboratory's performance continuously.

3. Establishment of Quality Assurance Program

A laboratory that wishes to be accredited has to set up its own Quality Assurance Program including quality documentation following the ISTA Accreditation Standard and its bylaws. This standard is based on ISO 25 guide, but has been especially amended to meet the needs of seed testing laboratories. For example sampling as an important preliminary stage of testing has been included and only the sampling and testing procedures prescribed in the ISTA Rules are accepted. An agreement with the current ISO 17025 for testing and calibration laboratories is previewed.

4. ISTA Audit

Prior to accreditation, and every three years thereafter, the laboratories are audited by two ISTA auditors (system and technical auditor) and based on the auditors' recommendation and the performance in the referee tests, accreditation is granted. Prior to the audit, the laboratories are requested to submit the quality documents translated into one of the official languages of ISTA to the Secretariat. The auditors will check the appropriateness of these documents prior to the audit. If the documents are considered appropriate for auditing a date will be arranged accordingly with the laboratory. The quality documents should at least contain a description of the quality assurance system, standard operational procedures (SOPs) and working instructions for all test methods carried out in the laboratory.

5. Authorisation to issue ISTA Certificates

After having successfully fulfilled the requirements of accreditation, authorisation to issue ISTA Certificates is obtained through the agreement of the government of the respective country. Therefore, the applicant is requested to complete Annex D of the application form by the respective government.

6. Establishment of Monitoring System

Upon decision of the government of each country a Monitoring System could be established for company laboratories.

The ISTA Accreditation is valid for three years. After the three year period a re-accreditation audit has to take place to maintain the accreditation status and the authorisation to issue ISTA Certificates. For further information on the ISTA quality assurance program please refer to the Secretariat: *Martina Rösch ISTA Secretariat, P.O. Box 308, 8302 Bassersdorf, Switzerland; Fax: ++41-1-8386001; E-mail: ista.office@ista.ch; Website: <http://www.seedtest.org>.*

Erratum on ISTA Accreditation Program

In Seed Info No 21 (July 2001) under the article ISTA Monitoring Standard we have mentioned that all seed company laboratories must adhere and agree to all conditions mentioned in the standard described. However, according to Martina Rösch, from ISTA Secretariat, the Ordinary Meeting during the ISTA Congress in Angers, France in 2001 decided that:

1. The Accreditation of the ISTA laboratories is ensured by fulfilling the requirements of the ISTA Accreditation Standard (ISTA Referee Test, ISTA Audit).
2. The Authorisation for accredited ISTA laboratories to issue ISTA certificates is the decision of the Designated Authority of each country.
3. The establishment of a monitoring system is recommended by ISTA but not obligatory. The decision of whether to set up a monitoring system is the responsibility of the Designated Authority of each country.
4. ISTA has established a Monitoring Standard and By-laws which can be used as a guideline for a monitoring system. On request, ISTA is prepared to support the Designated Authority in setting up a monitoring system.
5. At the end of the experiment, ISTA will request the Designated Authorities of countries, which have established a monitoring system to provide the results of their monitoring activities. We would like to thank Ms Rösch for bringing this to our attention (see also preceding article on ISTA accreditation).

UPOV Membership Reaches Fifty

The International Union for the Protection of New Varieties of Plants (UPOV), an intergovernmental

organization that promotes the development of new varieties of plants, marked its 40th anniversary in December 2001 with a growing number of States acceding to the UPOV Convention. The Republic of Korea became the 50th Contracting Party to the UPOV Convention, which was adopted on 2 December 1961, after the deposit of its instrument of accession to the UPOV Convention (1991 Act) on 7 December 2001.

The UPOV members have increased rapidly in recent years, growing from 20 at the end of 1992, to 50 today. A further increase in membership is expected as 19 States have initiated with the Council of UPOV the procedure for becoming members of the Union. In addition, 39 States have contacted the Secretariat in view of developing legislation in line with the UPOV Convention.

The mission of UPOV is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of society. For further information contact: UPOV Secretariat, 34, Chemin des Colombettes, CH-1211 Geneva 20, Switzerland; Fax: ++41-22-7330336; E-mail: upov.mail@wipo.int; Website: <http://www.upov.int>.

* * *

Contribution of Plant Breeders to Conservation of Plant Genetic Resources

Plant breeders were the first to recognise the need for conservation and maintenance of Plant Genetic Resources for Food and Agriculture (PGRFA). They created the first genebanks in the 1930s. In 1996, the International Association of Plant Breeders (ASSINSEL) carried out a survey showing that 88% of plant breeding companies maintained PGRFA and that, on average, plant breeding companies spent 5% of their research budget on conserving genetic resources, i.e. approximately US\$ 50 million each year (see www.worldseed.org).

In 2001, ASSINSEL carried out a similar survey of its members' activities in PGRFA conservation, characterization and evaluation to update the results of 1996. The synthesis of information received from 63 plant breeding companies in 14 countries is presented below.

The survey shows that ASSINSEL members spend on average 5.1% of their research budget on maintaining internal genebanks, and 5.8% of their

research budget for the characterization and evaluation of PGRFA held in their genebanks. If we consider that the global turnover of seed companies with research/plant breeding activities is about US\$ 20 billion, and that they spend 8% of their turnover on research, their total research budget can be estimated at approximately US\$ 1.6 billion, and their total budget for conservation, characterization and evaluation of germplasm is about US\$ 170 million.

These activities of ASSINSEL members are a substantial in kind contribution to the global effort aimed at fostering conservation, characterization, evaluation and sustainable use of PGRFA. The amount invested by plant breeders in the maintenance of their internal genebanks is equivalent to the annual budget required to implement the Global Plan of Action for the Conservation and Sustainable Use of PGRFA (adopted in Leipzig, 1996), estimated by FAO to lie between US\$ 150 and 455 million.

A significant part of the aforementioned US\$ 170 million is used to maintain improved breeding lines. However, the survey also shows that more than 80% of ASSINSEL members also maintain obsolete varieties, about two thirds conserve landraces, while more than half maintain wild relatives in their genebanks.

Many breeding companies have also developed collaborative activities with national and/or international programs. About two thirds of the respondents assist national programs in maintaining PGRFA, either technically or financially, and one third provide assistance to international programs.

Technology transfer relating to the maintenance of PGRFA is also an important commitment for many ASSINSEL members. While some members are based in developing countries, others have breeding programs in these countries and also conduct training programs there. In more than 40% of the cases, members grant licenses free of charge to developing countries. Finally, some companies also participate in international programs for technology transfer.

These figures confirm the results of the 1996 survey, and show that plant breeders are strongly committed to the conservation, characterization and evaluation of PGRFA. *ISF, Chemin du Reposoir 5-7, 11260 Nyon, Switzerland; Fax: ++41-22-365 44 21; E-mail: fis@worldseed.org; Website: <http://www.worldseed.org> (Note: FIS and ASSINSEL merged to form ISF in May 2002).*

CONTRIBUTIONS from SEED PROGRAMS and PROJECTS

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

Rebuilding the Afghanistan Seed Program



Afghanistan is a country of about 22 million people. Agriculture is the largest and most important sector of the economy employing 85% of the population.

Twenty three years of war coupled with the worst drought for three years have devastated Afghanistan's food-production capabilities and depleted critical seed stocks, leaving the nation heavily dependent upon food aid from international donors.

The relative peace slowly returning to Afghanistan is attracting the attention of the donor community to rebuild the nations devastated agriculture. From the outset the International Center for Agricultural Research in the Dry Areas (ICARDA) was quick to respond to the opportunities and challenges of building Afghanistan's agriculture in partnership with international and national organizations through financial support of the donor community.

Stakeholders Meeting in Tashkent

From 20-21 January 2002, ICARDA convened a *Stakeholders Meeting on Restoring Food Security and Rebuilding the Agricultural Sector of Afghanistan* in Tashkent, Uzbekistan through financial support of the United States Agency for International Development (USAID). About 74 participants representing 34 different organizations, including international agricultural research centers, development agencies, NGOs, universities, private sector and donors, together with Afghan agricultural experts, attended the meeting. At the end of the meeting the creation of a global consortium of research institutes, relief and development organizations, universities, and aid agencies was announced to undertake a multi-million dollar effort to rebuild Afghanistan's agriculture. The partnership called the *Future Harvest Consortium to Rebuild Agriculture in Afghanistan* and is led by ICARDA. The Consortium will take a holistic approach to rebuild Afghanistan's agriculture focusing, but not limited to, crop improvement and seed supply (both agricultural and horticultural); livestock, feed and

rangelands; natural resource management (soils, water) including institutional strengthening and human resource development.

Relief Seed Supply

In April about 3,500 tonnes of wheat seed, Inqilab 91 and MH 97, adapted to Afghanistan condition, was delivered from Pakistan for spring planting by the Future Harvest Consortium. The seed was distributed through a network of NGOs and FAO in collaboration with the Ministry of Agriculture to 65,000 farmers. Early crop establishment was satisfactory and the crops are thriving well in the field to produce the next harvest. Some of the harvest can be used as source seed for the next cycle of seed multiplication and distribution within the country to replenish the seed stocks. This will substantially reduce the seed cost and save the money required for trucking seed from outside.

The Consortium is also organizing the procurement and delivery of 6,000 tonnes of high quality wheat seed for autumn planting later in the year to achieve food security.

Moreover, the elite seed produced at ICARDA will be supplied for further multiplication and distribution to farmers in Afghanistan. About 20 tonnes of large number of released varieties and/or promising lines of wheat, barley, lentil, chickpea and vetch, some of which are of Afghanistan origin and with better adaptation to the agroecological zones of the country, are included in the multiplication.

Code of Conduct Meeting in Kabul

The Stakeholders meeting in Tashkent identified a need to develop a Code of Conduct for all interventions in the seed sector, including standards for import of seed and planting material into Afghanistan.

With financial support from USAID, the Ministry of Agriculture and Livestock, in cooperation with ICARDA and FAO, organized a Code of Conduct meeting in Kabul from 21-23 May 2002. About 80 participants representing the Ministry of Agriculture, CGIAR Centers, USAID, IFDC, FAO, US universities, NGOs attended the meeting. The workshop prepared a set of guidelines for seed production, distribution and import of seed and planting materials of field crops and quarantine.

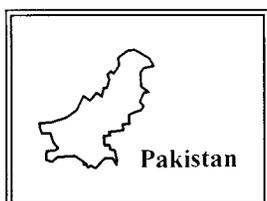
Institutional Strengthening

Training is a key for institutional strengthening and sustainable development of the national seed

industry. ICARDA in cooperation with the Afghanistan Ministry of Agriculture will organize the first in-country course on Seed Quality Control and Field Inspection in July 2002. Moreover, more than 20 participants will be received at ICARDA headquarter for Seed Quality (seed testing and seed health including enterprise development) course in September 2002.

As part of the reconstruction program of the seed sector, need assessments are carried out in Afghanistan. Equipment for central and satellite seed testing laboratories including three for seed health is being ordered and ready for shipment. In addition, low cost small cleaning machines are under fabrication in Syria for dispatch to Afghanistan to be used for cleaning seed for next planting season. For more details on FHCRAA visit the website at <http://www.futureharvest.org> or <http://www.icarda.cgiar.org> or contact: A.J.G. van Gastel, Head of Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria; Fax: ++963-21-2213490, 2225105; E-mail: A.Vangastel@cgiar.org

The Performance of Pakistan Seed Sector



In 1994, the seed business was declared as a 'seed industry' in Pakistan providing concessions given to other sectors. The policy has encouraged the development of the

vibrant private sector and several companies have been established to produce and market seed in the country. As a result the role of the private sector is increasing progressively over the years. According to 'The Seed News', the quantity of seed distributed by the public and private sectors is shown in Table 1.

The average certified seed distribution, from 1997/98 to 2000/01, by the public and private sector is 108,879, 2936, 2441 and 29,057 tonnes, respectively for wheat, rice, maize and cotton. The public sector provides the largest bulk of self-pollinated crops such as wheat and rice. The private sector provides nearly 80% of the commercial crops such as cotton and maize, where seed demand is more predictable because of hybrid seed.

In 2001 an estimated 209,026 tonnes of various crop seed was distributed covering 16.2% of the estimated national seed requirement. However, certified seed availability varies among crops with

1.03 for potato seed to 75.7% for fodder and forage seed. The availability for legumes and oil crops is less than the desired level (Table 2).

Table 1. Seed distribution of major crops in Pakistan (tonnes)

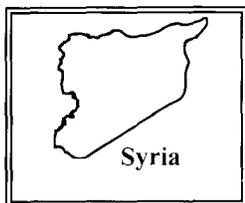
Year	Sector	Wheat	Rice	Maize	Cotton
1997/98	Public	65758	1414	282	5350
	Private	12786	1392	320	17778
	Total	78544	2806	602	23128
	Private (%)	16	50	53	77
1998/99	Public	76338	1496	491	4870
	Private	28055	793	2537	22152
	Total	104393	2289	3028	27022
	Private (%)	27	35	84	82
1999/00	Public	66350	1573	482	4436
	Private	39129	2830	3251	29684
	Total	105479	4403	3733	34120
	Private (%)	37	64	87	87
2000/01	Public	66755	914	676	6472
	Private	80346	1331	1725	25484
	Total	147101	2245	2401	31956
	Private (%)	55	59	72	80
Average	Public	68800	1349	483	5282
	Private	40079	1587	1958	23775
	Total	108879	2936	2441	29057
	Private (%)	36.8	54.0	80.2	81.8

Table 2. Quantity of seed distributed in 2001 and percent coverage of certified seed in Pakistan

Crop	Estimated requirement	Quantity distributed	%
Wheat	846,200	156,706	18.5
Rice	50,300	2269	4.5
Maize	26,820	2401	8.9
Chickpea	38,872	245	0.63
Mung bean	4,005	520	14.6
Canola	700	62	8.9
Soybean	805	71	10.1
Sunflower	1250	70	5.6
Vegetables	5,085	3702	72.8
Potato	221,000	2294	1.03
Fodder&Forages	14,500	10,980	75.7
Cotton	59260	29,706	50.1
Total	286797	209,026	16.2

Note: The information is extracted from *The Seed News*, July-December 2001

New Director General for GOSM in Syria

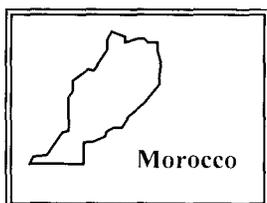


Abdel Muhsen Seyed Omar has been appointed as the Director General of the General Organization for Seed Multiplication in Syria since May 2002. Mr Omar was Head of Directorate of Agriculture

in Deir-ez-Zor province before his appointment as the Director General in GOSM. He has long experience in agricultural development in Syria.

The General Organization of Seed Multiplication is a parastatal organization providing seed of strategic crops like cereals, legumes, potato, cotton, etc. to the majority of farmers in Syria. The organization has high capacity seed processing plants, seed storage facilities and seed marketing outlets throughout the country.

New Director for DPVCTRF in Morocco



Mr M. Hilali has been appointed as Director General of Direction de la Protection des Vegetaux, de Controles Techniques et de la Repression des Fraudes

(DPVCTRF). He replaces Mr Mohamed Tourkmani who was the Director of the service for several years and a Country Representative of Morocco to the WANA Seed Network. Mr M. Tahiri becomes Head of Seed Certification. Mr Tahiri was formerly an Assistant Country Representative of Morocco to the WANA Seed Network.

The DPVCTRF is a regulatory agency for food and agriculture and in this context responsible for registration of new varieties in official catalogue and provide seed certification services through field inspection and laboratory analysis.

HOW TO

In this section we provide technical/practical information that seed sector staff may find useful. It is simple to follow instructions for technical staff in seed production and quality control.

How to No 25: Quality Manual for Seed Testing Laboratory

In our last issue of Seed Info we described the Standard Operating Procedures (SOPs) and guidelines for developing and using them. Similarly, working instructions known as Standard Administrative Procedures (SAPs) can be developed for laboratories for managerial tasks using the same guidelines and principles. In this issue we describe the 'Quality Manual' for seed testing laboratories.

The Quality Manual is simply the quality management standards i.e. ISO Guide 25 translated into a set of working documents for a given laboratory. ISO Guide 25 provides detailed guidelines for establishing an Integrated Quality Management System in all laboratories involved in quality control.

A typical Quality Manual contains four levels (Figure 1):

- Policies providing general information including the location, affiliation, purpose and quality policy of the laboratory. It also explains the areas of competence and the expertise available as well as the management structure and responsibilities in the laboratory. The policy statement should clearly spell out the proven competences for which the laboratory is accredited.
- Working instructions and procedures defining how, who, why and when to do what (SOPs and SAPs) in the laboratory. The documents provide detailed and verifiable written methods for performing and controlling all the processes involved in generating and delivering goods and services that will meet the client specified requirements.
- Tools containing checklists, log books, test recording forms, certificates, etc used by the laboratory.
- Non-in-house developed reference materials such as ISTA rules and handbooks.

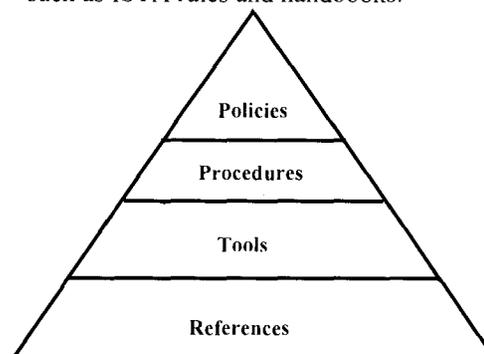


Fig 1. Schematic representation of quality manual

A Quality Manual is case specific and it varies in complexity and size from laboratory to laboratory. *Abdoul Aziz Niane, Seed Unit, ICARDA, P.O. Box 5466, Aleppo, Syria; E-mail: a.niane@cgiar.org*

RESEARCH NOTES

Short communication of practical oriented research/information in agriculture or seed technology are presented in this section

ISTA Position Paper on Seed Lot Size

Introduction

From the outset maximum lot size remains the basic requirement for seed lots for which an ISTA International Seed Lot Certificate is issued. The first issue of the ISTA Rules of 1931 prescribed maximum seed lot sizes i.e. 100 bags for grass seed and 50 bags for other crops. Maximum lot size for each crop species is now defined taking into account the specific properties of seed and conditions for seed trade. Since the conditions for seed trade change over time, ISTA maximum lot size also revised periodically, but remains as part of ISTA sampling system. Once again changing the seed lot size is under intense discussion in international forum.

FIS proposed to increase seed lot size from 25 to 30 tonnes for cereals and from 10 to 20 tonnes for grasses within the context of ISTA/FIS Experiment on Herbage Seed Lot Size. In view of harmonisation of the ISTA Rules and the AOSA Rules it was also proposed whether maximum lot size could be repealed from the ISTA Rules. This paper describes the position of ISTA on maximum lot size approved by the Ordinary Meeting on 21 June 2001.

Scientific Background on Maximum Lot Size

Sampling errors affect the accuracy of seed testing results. Drawing primary samples from the seed lot and sampling procedures in the laboratory are basic part of sampling. The statistical basis of the ISTA Rules for calculating the accuracy of seed testing results is based on the assumption that within seed lots there is a random distribution of seed quality. This is the best possible homogeneity expected and sampling seed lots is not considered as separate variance component in most tolerance tables in the ISTA Rules. For example tolerance tables for comparing two results of other seed counts are the same whether the two samples came from the same or from different submitted samples. In purity testing, however, a certain amount of non-homogeneity of seed lot is taken into account and consequently tolerance tables are different for the

two samples submitted from the same seed lot showing differences between these two tests.

The two basic measures justifying this assumption in tolerance tables are the definition of ISTA maximum seed lot size and the ISTA heterogeneity test in Appendix D of the ISTA Rules. Whereas the heterogeneity test provides information in case of any doubt on the homogeneity of a seed lot, the maximum seed lot size is a precautionary measure to avoid heterogeneity in seed lots. The efficiency of this measure is demonstrated in several scientific studies which indicates that with increasing lot size heterogeneity of the lots increases linearly (Figure 2). Due to the design of these studies, experimental data of the heterogeneity of ISTA maximum lot size could not be included in this figure, but the expected value is about 1% heterogeneous seed lots. So the figure shows that doubling the present ISTA maximum lot size, the average percentage of heterogeneous seed lots is higher than the expected value for the present maximum lot size.

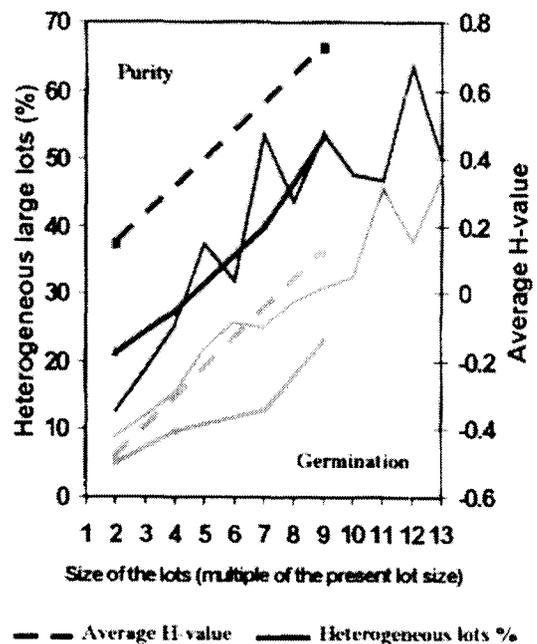


Fig 2. Increase in heterogeneity of seed lots with increasing lot size (from Kruse, 1999)

Furthermore, results from Germany indicated that in small-scale seed production heterogeneity is a greater problem than in large-scale seed production. However, in large-scale production heterogeneity also increases with lot size as observed in large scale grass seed production in the United States. Copeland and colleagues said "Excessive heterogeneity often exists in large seed lots, especially from natural production units (e.g. fields). Such seed lots are seldom if ever blended by state-of-the-art equipment, but are simply

conditioned, bagged, and marketed. Thus, the inherent heterogeneity commonly occurs among the containers (bags) in seed lots". And the authors concluded "As explained earlier, there are good reasons for the seed size restrictions on seed lots."

Heterogeneity in seed lots is a greater problem in chaffy seeds than in non-chaffy seeds. In the first phase of ISTA/FIS Experiment on Herbage Seed Lot Size, 88 seed lots with twice ISTA maximum seed lot size were tested for heterogeneity. According to ISTA heterogeneity test 75% of grass seed lots were classified as heterogeneous. This shows that increasing or repealing ISTA maximum lot size will increase the heterogeneity of lots.

Consequences on Seed Quality and Trade

The increasing heterogeneity due to increased or repealed ISTA maximum lot size will lead to higher sampling errors when drawing the primary samples from the seed lots. The first strategy is to stick to the heterogeneity test and the assumption that within seed lots only random distribution is acceptable. But in this strategy the statistical basis of the ISTA Rules will not meet the practical situation and is not acceptable. To overcome increase of heterogeneity in seed lots, it is possible to increase the sampling intensity, the number of primary samples drawn from the seed lot, which is shown to be efficient. However, increasing the number of primary samples over the present maximum of 30 samples restricted the efficiency and offers no solution. Consequently, the accuracy of the seed testing results will be impaired. This will lower the reliability of the decisions made on the seed lots during certification or trade. Consequently, in contrast to the present practice, the heterogeneity of the seed lots should take into account the statistical system of the ISTA Rules for all quality tests. The tolerance tables and the heterogeneity test have to be changed to reflect the new situation. Since experimental data for this modification is presently limited, assumptions must be made and agreed among responsible technical committees within ISTA. Therefore, at present there are no exact figures by what factor to broaden the tolerance, but preliminary estimates are between 5 and 20%.

Another issue for discussion is the test results on ISTA International Seed Lot Certificate which represent the average quality of the lot. By drawing a number of primary samples from the seed lot, the heterogeneity in the seed lot affects not unrestricted the accuracy of test results. In practical terms, the seed buyer expects that the results given on the certificate and on the label represent the quality of the seed in some of the containers he purchased. Although this expectation is statistically

unjustified, it is a common understanding in seed trade. And here it has to be realised that the reliability of the test results with view to this expectation is not unrestricted but directly impaired by heterogeneity among the containers in the seed lot. So from the consumer viewpoint, who buys some bags from a seed lot, heterogeneity of seed lots is much more important than from the producer viewpoint, whose interest is for the lot to meet quality standards for seed certification.

Conclusion

ISTA concentrates on improving the quality of seed testing results and on assuring the accuracy achieved in its member laboratories. Since the reliability of seed testing results on the ISTA International Seed Lot Certificate will definitively be impaired if the maximum lot size is increased or repealed, ISTA will not actively promote a change of the ISTA Rules. However, if all other partners in seed trade such as seed sellers, buyers and certification agencies agree to bigger lots, ISTA will adapt the Rules and will manage the technical consequences, particularly by setting up new tolerance tables reflecting the lower quality of seed testing results. *Source: ISTA News Bulletin No. 122, September 2001.*

MEETINGS and COURSES

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

Conferences



Asian Seed 2002, 18-21 November 2002, Ho Chi Minh City, Vietnam. Vietnam is an important emerging seed market in the region, with an established public and a developing private sector with remarkable progress in adoption of hybrid rice technology and promising private vegetable seed sector. The conference will comprise: (i) Country and Technical reports (19/11), (ii) APSA Special Interest Groups (20/11), and (iii) APSA Annual General Assembly Meeting (21/11). Further details, including registration form, table and booth layouts, program of events and a guide to Saigon will be published at the website soon. For those interested in receiving this information contact info@asianseed.org or APSA Secretariat, P.O.Box 1030 Kasetsart, Bangkok 10903, Thailand; Tel: ++66-02-940-5464, Fax: ++66-02-940-5467;

Email: apsa@apsaseed.com; Website: <http://www.apsaseed.com>

2nd International Agronomy Congress-2002: Balancing Food and Environment Security - A Continuing Challenge, 26-30 November 2002, New Delhi, India. The congress will be organized by Indian Society of Agronomy, Indian Council of Agricultural Research and National Academy of Agricultural Science. There will be three categories of presentations: (i) Plenary, (ii) Invited and (iii) Poster. In addition, the Working Groups will deliberate on the topics of current specific interests in Agronomy. For more information contact: Tel: ++11-5742283, 5781488; Fax: ++11-5742283, 5788380; E-mail: rcg@iari.ernet.in; Website: <http://www.agrosoc.com>.

ICPP 2003, 2-8 February 2003, Christchurch, New Zealand. The 8th International Congress of Plant Pathology will take place at the Christchurch Convention Center and will be organized by the Australasian Plant Pathology Society and the International Society for Plant Pathology.

The aims of the Congress are to:

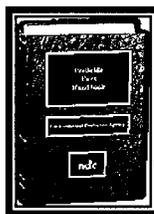
- educate and share information on plant diseases and their control
- encourage interaction among scientists and relevant disciplines from throughout the world
- solve problems through discussion and application of appropriate technologies
- contribute to effective and sustainable disease management
- strengthen global food security and environment protection .

For more information contact: Congress Secretariat Professional Development Group, PO Box 84, Lincoln University Canterbury, New Zealand; Fax: + 64 3 325 3685; Email: icpp@lincoln.ac.nz; Website: <http://events.lincoln.ac.nz/icpp2003/>

27th ISTA Congress, 13-25 May 2004, Budapest, Hungary. The International Seed Testing Association has made a preliminary announcement of the venue for the 27th ISTA Congress to be held in Budapest, Hungary from 13-25 May 2004. The program for the Congress includes Preliminary Meeting of Technical Committees and Executive Committee (13-15/5), Pre-congress Tours (16/5), Seed Symposium (17-19/5), Ordinary Meeting (20-21/5), Establishment of New Technical Committees (22/5) and Post-congress Tours to places of interest (23-25/5). For more information you may contact ISTA Secretariat or visit the website at: <http://www.seedtest.org/27congress/27istac.cfm>

LITERATURE

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



J. M. Alston, P.G. Pardey and M.J. Taylor (eds.). 2001. Agricultural Science Policy: Changing Global Agendas. The papers provide a broad, yet rigorous overview of the factors that are shaping the research agenda. Thus, competing for funds with the traditional areas of productivity enhancement, economic growth, farm incomes and food security, come the environment, genetic diversity, food safety and intellectual property rights, to name but a few.

The authors share a concern that the factors influencing agricultural R & D are so new and progress so rapidly, that policy makers are coming to decisions without the benefit of sound economic analysis or an understanding of economic consequences. Their contributions are closely written and technical, and will be of interest to all who are working in or studying the area. The Johns Hopkins University Press, 2715 North Charles Street, Baltimore, Maryland, 21218-4363; 312pp, ISBN 0 8081 6604 9 (Pb), Price US\$21.95; Website: <http://www.press.jhu.edu>

A.W. Shepherd. 2000. Understanding and Using Market Information: Market Extension Guide 2. It is written in clear language and illustrated with drawings, which all contain a memorable message. Three basic questions are addressed: why farmers need market information; how they can use information and benefit from its use; and what kinds of information are available to them. Subjects covered include how to obtain information, why prices change, calculating marketing costs, and using market information for production planning. A Guide to Maize Marketing for extension officers and A Guide to Marketing Costs are also available in the same series. Published by FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy. Copies are available from Andrew.Shepherd@fao.org or by downloading from the website <http://www.fao.org>; [demon.co.uk](http://www.demon.co.uk); Website: <http://www.zedbooks.demon.co.uk>.

J. Tuxill and G.P. Nabhan. 2001. People, Plants and Protected Areas: A Guide to *in situ* Management. This volume in the People and Plants series focuses on how protected areas can be better managed, and presents new approaches for

the conservation of plants within their native habitats. It particularly recognizes the social dimension of *in situ* protection, highlighting the collaboration that is necessary between professionals and local communities. Published by Earthscan, 120 Pentonville Road, London, N1 9JN, UK; Email: earthinfo@earthscan.co.uk; Website: <http://www.earthscan.co.uk>; 262pp, ISBN 1 85383 782 2 (Pb), Price £24.95.

Internet Guidebook: Training and Extension.

This Internet Guidebook is a subject-oriented internet resource guide on training, training courses, training methodology, education, extension, extension methodology, consulting and related fields. It has been created in order to supply a useful tool, facilitating the search of information available in the World Wide Web. It is divided into two main sections: training and extension. It is thought to be useful for projects of technical cooperation, as well as for partner organizations in

developing countries. For more information contact: GTZ, Dag-Hammarskjold-Weg 1-5, Postfach 5180, 65726 Eschborn, Germany; Website: <http://www.gtz.de>.

Useful Internet Sites

Cartagena Protocol on Biosafety: The Cartagena Protocol on Biosafety to the Convention on Biological Diversity was adopted by the Conference of the Parties to the Convention on 29 January 2000. The website will provide all information related Meeting records of the Expert Group on Handling, Transport, Packaging and Identification of Living Modified Organisms (available in English, French, Spanish, at website: <http://www.biodiv.org/biosafety>).

International Treaty on Plant Genetic Resources for Food and Agriculture available in English, French, Spanish, Arabic and Chinese at website: <http://www.fao.org>.

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