



international society
for seed science

issS newsletter

number 2

december, 2001

● *issS membership*

By now you should have renewed your subscription to ISSS for 2002, but if you have not yet done so, please send your completed form with the membership fee to the Treasurer, Hugh Pritchard and a copy to the Secretary, Kent Bradford as soon as possible. Membership of our society is rising steadily but of course we would like to have many more to strengthen the ISSS and sustain our activities. So please persuade your seed scientist colleagues to join. The benefits of membership already include reduced subscription to *Seed Science Research*, lower-cost access to CABI's seed publications (see the item below about our new 'Gateway'), participation in all ISSS meetings at reduced fees, and financial assistance for attendance by younger researchers. We are constantly looking for ways to extend the society's services to members, so if you have any ideas please contact one of the Officers.

● *issS organization*

Three sub-committees are now established and functioning. They are:

Membership: Kent Bradford (Chair; kjbradford@ucdavis.edu) Steve Adkins, (Australia) for Australia and New Zealand, Patricia Berjak, South Africa (for Southern Africa), Renata Bogatek (Poland) for Central and Eastern Europe, Roberto Benech-Arnold (Argentina) for South America, Mirian Eira (Brazil) for South America, Paul Cavers (Canada) for North America, Jorge Vazquez-Ramos (Mexico) for Mexico and Central America, Jia-Rui Fu (China) for China and Japan. Swati Sen-Mandi, (India) for India.

Meetings: Daniel Côme (Chair; come@ccr.jussieu.fr), Gregorio Nicolas, Patricia Berjak, Paul Cavers, Ken Thompson, Steve Adkins, Ralph Obendorf, Jorge Vázquez Ramos and Jia-Rui Fu.

Finance: Hugh Pritchard (Chair; h.pritchard@rbgkew.org.uk) Swati Sen-Mandi, Yitzchak Gutterman, The Secretary (Kent Bradford), The President (at present Daniel Come, followed in May 2002 by Ralph Obendorf; rlo1@cornell.edu).

Publications: Michael Black (Chair; michael.black@kcl.ac.uk), Patricia Berjak, Marc Cohn, Henk Hilhorst, Hugh Pritchard and Ken Thompson.

If you have an enquiry, a comment or suggestion about any of these sub-committees please contact the appropriate Chair.

● *seventh international workshop on seeds*

Arrangements for the Seventh International Workshop in Salamanca, Spain, 12-16 May, 2002, are well in hand. **The deadline for registration has been extended to December 20, 2002.** ISSS members receive reduced rates for registration. Registration information for the meeting is available at http://www.geocities.com/workshop_on_seeds/. We look forward to seeing you there, catching up on the latest in seed science, meeting friends and colleagues again, and enjoying the wine and food of Spain in the magnificent city of Salamanca.

Please note that in Salamanca we will decide the venue of the next (eighth) workshop. **You are invited to submit a proposal to host the next Seed Workshop in 2005.** All proposals, which will be evaluated by the Meetings Sub-committee, should be submitted to its Chair, Daniel Côme, before the end of December 2001. We already have two proposals, one from Claudinei Andreoli (Brazil) and the other from Steve Adkins (Australia). The final decision on all proposals will be made at the Salamanca meeting.

cabi-iss gateway

The following message is provided by Liz Bennett, Plant Sciences Publisher, CABI Publishing:

SEED SCIENCE ONLINE – A NEW GATEWAY FROM CABI PUBLISHING

CABI *Publishing*, together with the International Society for Seed Science, is pleased to announce the launch of a brand new Internet gateway service exclusively for members of the ISSS. Seed Science Online will be launched on 1st December 2001, providing ISSS members with immediate free access to CABI Publishing's online seed science research database, *Seed Abstracts*. The trial will be available until the end of January 2002, after which other opportunities will exist for trials and special offers.

Simply visit www.cabi-publishing.org/SSO to search the database and gain access to fully searchable, weekly updated research summaries, full bibliographic details of journal articles, comprehensive author and subject indexes, report information, conference proceedings and a 10-year backfile. This unrivalled information service provides comprehensive coverage of the world's literature on seed biology, chemistry, storage, ecology, pests and diseases and processing and regulations. *Seed Abstracts* is published in consultation with the International Seed Testing Association.

In collaboration with the International Society for Seed Science, CABI *Publishing* also provides exclusive discounts to ISSS members offering savings when subscribing to our two essential seed journal titles, *Seed Science Research* and *Seed Abstracts*. As a publisher of over 500 books, many of which include seed related titles, we also offer ISSS members a 25% discount on featured books. For details of these special offers, please visit the ISSS website.

CABI *Publishing* is one of the world's foremost publishers of databases, books, journals, CD-ROMS and Internet resources in the applied life sciences. For more information on our complete range of products, please visit our website at www.cabi-publishing.org/.

We look forward to your visiting www.cabi-publishing.org/SSO.

Yours sincerely



Liz Bennett
Plant Sciences Publisher
CABI Publishing

● *seed science research*

Seed Science Research, the official journal of ISSS, holds its position as the major publication outlet in basic seed science:

- The latest ISI Impact factor for SSR is 1.77. This ranks SSR among the top 20 journals (out of 137) in plant biology, higher than many well-known, long-established journals.
- Since 1997, more basic seed biology papers have been published in SSR than in *Plant Physiology*, *Planta*, *Physiologia Plantarum*, and *Journal of Experimental Botany* combined.
- In the March 2002 issue of SSR, M.E. Musgrave presents the first-ever review of seed biology in low gravitational field environments (i.e. space). Research topics include a new method for measuring seed viability, resolution of some problems in the storage biology of *Fagus* species, physiology of tea seed development, and a reappraisal of the role of antioxidant enzymes and lipoxygenase in seedling vigor.
- Andreas Richter and Patricia Berjak have been appointed to the Editorial Board

So consider sending your next manuscript to *Seed Science Research*!

● *around the labs, around the regions*

AUSTRALIA

A National Conference: The Fourth Australian Workshop on Native Seed Biology for Revegetation was held in Mildura, Victoria on the 3-4th of September, 2001. This workshop was unique in bringing together personnel with experience in revegetation in the mining sector and the commercial seed industry, as well as from community and research groups and government agencies. The major themes of the workshop were Seed Production, Quality and Storage; Dormancy and Germination; Establishment and Management; Biology and Restoration of Wetlands; and Saline Sites. Each sector of the industry was well represented, and it was good to see an increasing attendance from community groups such as Greening Australia. The presentations were both interesting and relevant and provided food for thought for all attendees.

A new research program push (in Steve Adkins' lab): Rehabilitation of post-mined sites depends on the effective and efficient use of native seed. For most mine sites where seed is available, failure to recruit native species seed is due to a number of quality factors that lead to poor or no seedling establishment. Whereas improvements have been made in the development of dormancy-breaking applications, a significant number of native species still remain difficult to establish due to other seed quality issues. Without a complete protocol of how and when to harvest, how to handle and store seed and how to pre-treat and sow seed, establishment of many native species will remain poor or non-existent. The objectives of this project are to determine (1) a protocol for collection and handling of native seed, (2) a means for assessing seed quality and viability, (3) a means for effective storage of native seed, (4) the mechanisms by which deep dormancy occurs in native species, and (5) practical and efficient methods for breaking dormancy in seed collections.

BRAZIL

Brazilian attendance at the 26th Congress of the International Seed Testing Association

About 560 participants from different countries attended the 26th ISTA Congress, which was held in Angers, France from June 14 to June 22, 2001. Brazil was second only to France in the number of participants (40), who came from public and private research institutions, universities and private companies. A number of posters were presented on topics such as seed production, seed quality, seed pathology, seed development, seed germination and seed analysis in different species. The high attendance and quality of presentations indicates the size of the seed industry and the importance of seed research in Brazil.

CHINA

The following are some of the laboratories in China involved in seed science. Contact may be made through the regional representative, Prof Jia-rui Fu (lssfjr@zsulink.zsu.edu.cn).

- Laboratory of Seed Physiology, Beijing Botanical Garden, China Academy of Sciences, Beijing, 100093. Ultradrying and seed storage
- Laboratory of Quantitative Vegetation Ecology, Institute of Botany, Beijing, 100093. Seed ecology
- Seed Bank, Institute of Germplasm, China Academy of Agriculture, Beijing. Storage of seeds
- Institute of Subtropical Crops, Zhejiang Academy of Sciences, Wenzhou, 325005. Chestnut seed storage and dehydration susceptibility
- College of Life Sciences, Zhejiang University, Hanzhou, 310029. Ultradrying and storage.
- School of Agricultural Biology, South China Agricultural University, Guangzhou, 510642. Seed testing
- Institute of Rice Crops, Guangdong, 510640. Rice seed
- Beijing Institute of Vegetable Crops. Vegetable seeds
- Institute of Forestry, Beijing. Tree Seeds
- School of Life Sciences, Zhongshan University, Guangzhou, 510275. Desiccation tolerance, recalcitrant seeds
- Seed Bank & Laboratory of Seeds, Ban-Na Subtropical Botanical Garden, Yunnan. Seed storage, recalcitrant seeds

POLAND

**University of Technology and Agriculture
Department of Genetics and Plant Breeding
Bydgoszcz, Poland.**

Head of Department: Prof. Dr hab. Pawel Nowaczyk

Ongoing projects in seed science and technology 2001/2002:

- Changes in cell cycle activity and quality of hydrated sugar-beet seeds during storage.

- Endoreduplication in sugar- and fodder-beet seeds and seedlings during germination and growth under different conditions in vitro and in soil.
- Genetical and technological methods of seed enhancement.
- Gene *aj* in production of hybrid seeds of *Capsicum annuum*.
- Formation of seeds by interspecific hybrids of *Capsicum* species.
- Cell cycle activity in developing seeds of carrot and radish (in co-operation with the Agricultural University, Poznań).
- Analysis of the quality and ploidy of the seeds of sugarbeet cultivars registered in Poland (in co-operation with the National Cultivar Testing Station, Słupia Wielka).

In addition to the existing flow cytometry lab, the new molecular biology lab has been lately established (within the frame of TEMPUS Phare project), opening the possibility to apply molecular techniques to the Department's research. The labs are open for any kind of local and international co-operation (common projects, student exchange, etc.).

Research Institute of Pomology and Floriculture

Seed Science Laboratory. Skierniewice, Poland

Scientific staff: Prof. Dr. hab. Mieczyslaw Grzesik, Dr. Krzysztof Górnik, Ms. S Agnieszka Karsznicka (PhD student), Ms. S Bogumila Badek (PhD student)

Research on theoretical and practical aspects of:

- Development of methodology for control of seed germination, vigor and seed conditioning.
- Regulation of seed germination with growth regulators and other chemicals, temperature, water potential, scarification, freezing, chilling.
- Improvement of seed germination and plant development under stress conditions or decreasing of aging by seed osmopriming, matricconditioning, drum-priming, hydropriming.
- Storage of seeds at different temperature, humidity and after treatment with chemicals.
- Role of free radicals and enzymatic or non-enzymatic antioxidants in seed aging and improvement of seed vigor and plant development.
- Improvement of seed yield and seed quality under environmental stress conditions, by treatments that increase and accelerate flowering, pollination and maturation of seeds.

Research is supported by State Committee for Scientific Research in Poland and by seed companies and is conducted under bilateral cooperation with Polish laboratories and with Universite Pierre et Marie Curie in Paris, Netherlands Organization for Applied Scientific Research in Leiden and in the frame of COST Action 828 "Seed Science in the Field of Genetically Controlled Stress Physiology", in which laboratories from 15 countries are cooperating.

The laboratory conducts scientific training every year for Polish students and students of Universite Pierre et Marie Curie. In 2001, Doumecq Cyrille from Paris, conducted research and

prepared a 'memoire' in the Frame of the Third Graduate Degree DESS "Technologies appliquées aux organes végétaux" entitled "Improving of the germination and vigor of aged *Callistephus chinensis* seeds by presowing treatments".

Every year the laboratory actively participates in International and Polish Conferences in which scientists from Eastern Europe are invited.

**Research Institute of Vegetable Crops
Seed Physiology and Pathology Laboratory
Skierniewice, Poland
Head, Prof. Dr. hab. Regina Janas**

In Poland there is a large market for vegetables. The area of vegetable production covers about 250,000 ha. The size of an average vegetable farm is a few hectares; hence, many farmers are involved in vegetable production. This institution works to solve problems of these farmers. The main objective of the RIVC is applied research and extension activity.

In 1976 the Seed Physiology and Pathology Lab was organized. Seeds of all vegetable species are produced in Poland, with carrot, onion and cabbage being of great importance. The team of the Lab is experienced in conducting technical research on seed production methods. Recent studies concentrated on seed health status and antagonistic pre-sowing seed treatments. The former covers antagonistic fungi application in seed borne fungi control as well as routine diagnosis of fungal infection of seeds. Pre-sowing seed research concerns physiological and biological methods to improve, synchronize and hasten field emergence.

**Warsaw Agricultural University
Faculty of Agriculture
Department of Plant Physiology
Laboratory of Molecular Plant Physiology
Warsaw, Poland
Scientific staff: Dr. Renata Bogatek, Dr. Hanna Rutkowska, Krystyna Oracz (MS student), Weronika Zakrzewska (MS student)**

Main research topics:

- Physiological, biochemical and hormonal regulation of seed germination and dormancy removal (role and mode of action of cyanide).
- Regulation of metabolic processes in seeds and seedlings under various conditions (chilling, drought, aging, priming).
- Oxidative stress in plants and mechanism of activation of antioxidant system in seeds and seedlings subjected to different stresses.
- Physiological, biochemical and molecular basis of allelopathy (gene expression induced by allelopathy during germination and growth of seedlings).

The lab collaborates with Polish laboratories: Seed Sciences Lab., Research Institute of Pomology and Floriculture (Skierniewice), Institute of Experimental Plant Biology University of Warsaw and with Laboratoire de Physiologie Végétale Appliquée, Université Pierre et Marie Curie.

**Warsaw Agricultural University
Faculty of Agriculture
Department of Plant Physiology
Laboratory of Plant Breeding and Seed Science
Head of the Department: Prof. Dr hab. Sławomir Podlaski**

Main research topics:

- Analysis of seed quality of sugar beet cultivars registered in Poland (chlorophyll fluorescence).
- The effect of seed properties on germination and field emergence of beet.
- Properties of pellets affecting germination of pelleted seeds.
- World seed industry and organization and function of Polish seed industry.
- Evaluation of soja mutants.
- Breeding of diploid potatoes.

**Warsaw Agricultural University
Faculty of Horticulture and Landscape Architecture
Department of Pomology and Basic Sciences in Horticulture
Warsaw, Poland
Scientific staff: Prof. Dr hab. Stanisław Gawroński, Dr. hab. prof. AWU Helena
Gawrońska, Dr. Dorota Ciarka, MS Waldemar Bernat**

Seed germination and early seedling growth of weeds and winter wheat under stress of allelopathy (mode of action of sunflower allelopathics) is a part of studies performed in a project entitled: " Strategies of weed control in organic farming" granted within 5 FP of EU that consists of work package 4. "Precrop mulching as a strategy of allelopathic prevention and control of weeds in winter wheat". Studies in this project include the effect of allelopathy on seed germination and early seedling growth concentrating on:

- Allelopathic potential of sunflower (genotypical variation, plant organs and growth stage, environmental conditions influencing allelopathic activity, sunflower mulch as a means of reducing weed germination in organic farming).
- Germinability of mustard seeds - model weed plant (dynamics of imbibition, germination, seedling morphology).
- Biochemical and molecular mode of action of sunflower allelopathics (oxidative stress, metabolic processes).

This part of the project is realized in co-operation with Department of Plant Physiology, Warsaw Agricultural University coordinated by Dr. Renata Bogatek.

**University of Szczecin
Department of Plant Physiology
1) Lab. of Plant Physiology (Prof. Dr hab. J.Kepczynski)
2) Lab. of Biotechnology (Dr hab. prof. US E. Kepczynska)
Szczecin, Poland**

Main fields of research:

- Hormonal regulation of dormancy release and seed germination.
- Role of phytohormones in spore germination and growth of plant pathogen mycelia
- Biotechnological principles of somatic embryo production.
- Role of ethylene in the process of *Agrobacterium*-mediated plant transformation.
- Molecular principles of ethylene biosynthesis.

We have bilateral cooperation with Université Pierre et Marie Curie, Paris (1994-2004), 'Role of phytohormones in dormancy removal and germination of seeds in relation to development of fungal pathogens'.

RUSSIA

There was a large meeting (1999, Moscow) of the Russian Society of Plant Physiologists, but only a small session devoted to seed physiology was organized. There was also a special seed meeting organized by Russian Academy of Agricultural Sciences (Moscow, December 1999) aimed mainly at coordination of local seed testing stations with one session concerning crop seed physiology.

A book ***Seed Biology*** written by M.N. Nikolaeva, E.M. Pozdova and I.V. Lyanguzova from Botanical Institute of Russian Academy of Sciences appeared in 1999, and a special seed physiology issue of Russian Journal of Plant Physiology (1999, vol. 46, no. 3) was published.

In 2001 the K.A. Timiryazev prize of the Russian Academy of Sciences was awarded for the book by Prof N. Obroucheva, ***Seed Germination: A Guide to the Early Stages*** (1999, Leiden).

The following small teams are engaged in seed science in Russia:

- M.A. Belozerskii Institute of Physico-chemical Biology, Moscow University: storage proteins of buckwheat.
- T.V. Veselova & V.A. Veselovskii Dept. Biophysics, Faculty of Biology, Moscow University: seed ageing and oxidative stress.
- T.B. Batygina, Botanical Institute, St. Petersburg: genetic heterogeneity of developing seeds.
- E.M. Pozdova, Botanical Institute, St. Petersburg: seed after-ripening after dispersal
- I.V. Lyanguzova, Botanical Institute, St. Petersburg: seed germination in highly polluted seeds.
- V.L. Tikhonova, Main Botanical Garden, Moscow: long-term cryopreservation of natural seed populations.
- A.S. Popov, Institute of Plant Physiology, Moscow: cryopreservation and germination of orchid seeds.
- I.V. Tretyakova, Institute of Forestry & Wood, Krasnoyarsk: embryogenesis of conifers.
- T.A. Valueva, Institute of Biochemistry, Moscow: proteinase inhibitors in seeds.
- N.A. Gumilayevskaya, Institute of Biochemistry, Moscow: proteins in dormant and germinating recalcitrant seeds.

- N.V. Obroucheva & O.V. Antipova, Institute of Plant Physiology, Moscow: seed dormancy and germination.

UNITED KINGDOM

Two meetings were held in 2001 in the recently opened Wellcome Trust Millennium Building (Royal Botanic Gardens Kew, Wakehurst Place, UK), home to the Millennium Seed Bank project.

Sixty delegates attended **The 21st Annual UK Seed Biology Meeting**, held on 24 April. This included the first ISSS-sponsored lecture titled "DNA degradation or DNA repair: which wins after a seed is stored?" delivered by Prof. Daphne Osborne.

In the summer (27-31 July), some 88 delegates from 27 countries, including 29 Millennium Seed Bank project collaborators, attended Kew's international workshop on "**Seed Conservation: Turning Science into Practice**." Many contributions were made by ISSS members. The proceedings, to be published in 2002 under the editorship of Roger Smith *et al.* will be a benchmark text for seed conservation.

UNITED STATES OF AMERICA

The **Seed Biotechnology Center** (SBC) at the University of California, Davis, USA, is building a new office and laboratory facility. Contributions from the seed industry totaling over US\$1.3 million were received in a capital development campaign for this purpose. In addition, the California Crop Improvement Association (CCIA), the local seed certifying agency, is investing US\$400,000 into the project to build a seed and genetic testing laboratory. The SBC and CCIA are partnering with the campus to build about 15% of this new research facility. Other occupants of the building will initially be genomics and bioinformatics faculty associated with a campus genomics initiative. In 2004, a new US\$90 million building will be completed to house these and approximately 35 other faculty programs in genomics and bioinformatics. At that time, the remaining 85% of the SBC building will become available to consolidate the CCIA administrative and laboratory programs and to house additional faculty from the College of Agricultural and Environmental Sciences. Faculty who will focus on plant reproductive biology, including seed biology and vegetative plant propagation, will be co-located in this building. Along with the SBC and the CCIA, this will create a research and service institute oriented toward basic seed biology, seed production, seed technology and seed certification as well as the vegetative propagation of plants. Initial occupancy of the building is expected in December 2002. For more information, see <http://sbc.ucdavis.edu>.

M.A. Cohn (Editor of Seed Science Research) was the recipient of the American Society of Plant Biologists (Southern Division) Distinguished Service Award for 2001. Congratulations! And three cheers for red rice.

meetings update

ISSS-SPONSORED MEETINGS

Benefits to ISSS members are available for ISSS-sponsored meetings.

**22nd Seed Biology and Ecology meeting (ISSS sponsored)
Reading UK, Thursday April 11th 2002.**

The meeting is an informal forum for researchers to exchange ideas on all aspects of seed biology and ecology. We encourage as many people as possible to present their work. This annual meeting takes the form of short (15-minute) research presentations, followed by informal discussion. Poster presentations will also be possible.

More details will be circulated in the near future to those who attended last year's meeting at Wakehurst Place. If you want to be added to the mailing list, please contact the local organizer, Dr Alistair J Murdoch, Seed Science Laboratory, Department of Agriculture, The University of Reading, Earley Gate, PO Box 237, Reading RG6 6AR, U.K.

Tel. +44 (0)118 931 6746, Fax: +44 (0)118 931 8297

Department URL: <http://www.agric.rdg.ac.uk/>

Fourth International Workshop on Desiccation Sensitivity and Tolerance in Seeds and Vegetative Plant Tissues (ISSS sponsored)

August 25-31 2003. Niewoudtville, NW Cape Province, South Africa.

Contact: deswork@biology.und.ac.za as soon as possible for more information.

Other ISSS-sponsored meetings

The Meetings Sub-committee is now planning to organize small, specialized meetings in the years before the Eighth Workshop in 2005. Members will be informed when arrangements are finalized.

OTHER MEETINGS

**Society for Experimental Biology Annual Meeting
8-12 April 2002 Swansea, UK**

seb@sebiology.org

**Plant Biotechnology 2002 and Beyond
10th International Congress of Plant Tissue Culture & Biotechnology
23-28 June 2002, Orlando, Florida, USA**

sivb@sivb.org or <http://www.hos.ufl.edu/ikvweb/iaptcb.htm>

**29th Annual Conference of the Plant Growth Regulation Society of America
28 July-1 August 2002, Halifax, Nova Scotia, Canada**

w-mackay@tamu.edu or <http://www.griffin.peachnet.edu/pgrsa>

**International Workshop on Applied Seed Biology--Improving Seed Quality
September 2002, Skierniewice, Poland**

Organized by The Research Institute of Pomology and Floriculture in Skierniewice, Universite P. et M. Curie in Paris, Netherlands Organization for Applied Scientific Research in Leiden and Warsaw Agricultural University.

come@ccr.jussieu.fr

XXVI International Horticultural Congress**11- 17 August 2002, Toronto, Canada**<http://www.ihc200.org/ihc2002/cgi.html>**International Congress of Ecology****11-18 August 2002, Seoul, Korea**farina@intecol.org**13th Congress of the Federation of European Societies of Plant Physiologists****1-6 September 2002, Heraklion, Crete, Greece**<http://www.biology.uoc.gr/meetings/FESPP/>**Tree Seeds 2002****11-15 September 2002, Chania, Crete, Greece**

Annual Meeting of IUFRO 2.09.00 'Research Group for Seed Physiology and Technology'.

<http://www.cc.uoa.gr/biology/TreeSeeds2002.htm>**Crop Science Society of America Annual Meeting****11-14 November 2002, Indianapolis, USA**<http://www.asa-cssa-sssa.org/calender/>**American Society of Plant Biologists Annual Meeting****3-7 August 2002, Denver, Colorado, USA**www.aspb.org/meetings**7th International Congress of Plant Molecular Biology****16-21 June 2003, Barcelona, Spain**<http://www.ispmb2003.com/>**● *your news and suggestions***

We welcome your suggestions and comments concerning the activities of the ISSS and news of what's happening in your region and your laboratory (seeds, of course!). We would like to hear your ideas about topics for meetings, courses, etc., and the relations between ISSS and local, national and international seed societies. Please use the Newsletters as a way of publicising your work area and establishing contacts and –who knows?– collaborations. All suggestions and contributions to the Newsletter are welcome. They should be sent to Michael Black (michael.black@kcl.ac.uk).

● *and in conclusion*

We send **Season's Greetings** to all members, wishing them a happy, healthy and successful New Year.