Seed Testing INTERNATIONAL

ISTA News Bulletin No. 138 October 2009

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Seed Testing
INTERNATIONAL

EDITORIAL

Dear Reader,

As I write this editorial, I will be returning from Rome after the 2nd World Seed Conference on 8–10 September, organized by the five main international bodies involved with seed – the FAO, the OECD, UPOV, the ISF and ISTA. The outcome of this highly important conference is summarized in the press release on p. 16.

The October issue of STI is of course always the one following the ISTA Annual Meeting or Congress in June, and so we report on the 2009 Meeting in Zurich. Highlights of the Meeting were the Seed Analyst Training (SAT) Workshop and the Purity Seminar, and you will find reports on both in this issue. There has been quite some progress made in SAT since the ISTA SAT Committee was established in 2006. The feedback gained at this SAT Workshop will be very valuable to the Committee. You will no doubt be reading more about SAT in the future.

At the Purity Seminar, an important topic was the Universal Blowing Procedure for calibrating seed blowers for purity testing. Apart from the report on the Seminar, you will also find an detailed article on this procedure in the Rules Development section.

It goes without saying that, as in every October issue, you will also find a report on the ISTA Ordinary Meeting, with all the decisions that were taken there, including all changes to the ISTA Rules for 2010.

2010 is an ISTA Congress year, and in this issue we bring further information on this important event, which will take place in Cologne, Germany. Papers submitted for the Seed Symposium are now being reviewed. The final programme will appear in the next issue of STI.

At each Congress, the Ordinary Meeting marks the end of the term of office for the Executive Committee and current President, who will step down and make way for the current 1st Vice-President. A new Vice-President will be elected, and the Members-at-Large re-elected or newly elected. How this is achieved in detail is described in two articles which originally appeared in STI in 2006.

These elections will influence ISTA's way forward for the next three years, and I therefore hope that as many Delegates as possible will come to Cologne in June to take part in this process.

You will also find in this issue another historical article on the early days of seed testing, this time on forest seeds, and a report on a project to create a library of digital seed photographs.

We are always looking for interesting material for STI, from all areas of seed testing. So if you think you may have something, please let us know. And now, please enjoy this latest issue of Seed Testing International.

Yours sincerely,

Michael Muschick

Seed Testing International
No. 138 October 2009

Produced on behalf of the
ISTA Executive Committee

EDITOR-IN-CHIEF
Dr. Michael Muschick
CO-EDITORS
Ms. Patricia Raubo
Mr. Jonathan Taylor

International Seed Testing Association (ISTA)
ISTA Secretariat
Zürichstrasse 50
CH-8303 Bassersdorf, Switzerland

Phone: +41 44 838 60 00
Fax: +41 44 838 60 01
E-mail: ista.office@ista.ch
Internet: www.seedtest.org

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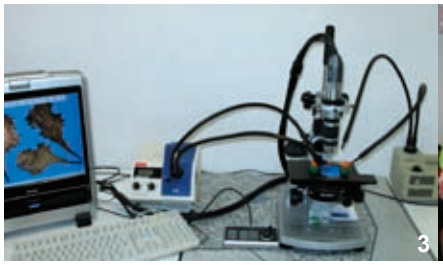

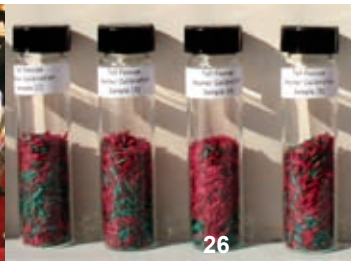

President's Report

Dr. Katalin Ertsey

When you have in your hand this October 2009 issue of Seed Testing International, both our Annual Meeting in Zurich and the 2nd World Seed Conference in Rome will be over, but at the time of writing this report I am between these two important events.

First of all, I would like to thank all the participants of our Annual Meeting for their active work and positive decisions. The high number of experts and the positive atmosphere during the workshops, TCOM presentations and Ordinary Meeting show once again ISTA's competence and viability. I would also like to take this opportunity to acknowledge the efficient and hard work of our Secretariat.

The event began with the Seed Analyst Training Workshop, which aimed to clarify – after three years' discussion – the role of ISTA as a possible provider of training for seed analysts. Representatives from the various regions performed a thorough and highly competent analysis of the situation in the laboratories, and the possible development and maintenance of capacity in seed testing. The outcome showed us a very colourful picture. Once more, we have to face the challenge of differences at the system and evaluation levels. The round-table brainstorming sessions (good practice for the future) were an excellent opportunity to collect a wide range of good ideas. The conclusions and recommendations were made by our past President, Pieter Oosterveld, the workshop moderator. I hope that the 29th ISTA Congress in Cologne can bring this important issue to a close.

The programme continued with the Seminar on Purity Testing. Purity test methods and the analytical purity of the seed lot are still one of the most important issues in seed testing. The well-known speakers presented the latest scientific developments.

With regard to the TCOM presentations, the question has been raised again and again whether there is enough time for both the open and closed sessions, and how to avoid overlapping for Members who wish to participate in more than one discussion. This year, the structure was satisfactory and fulfilled all requirements. The presentations of all TCOM chairs were so excellent, brief and precise that I suggest to the Executive Committee to keep this format for future Meetings.

Following a former ECOM decision, each Ordinary Meeting (OM) opens with a presentation by a guest speaker about the legal and economic background of the seed sector of the region where the meeting is held. This year, Garlich von Essen, the Secretary General of the European Seed Association, gave a talk on 'Breeding and seed production for the 21st century'. This presentation focused on the development of 'better regulation', a procedure aiming to make European seed legislation cheaper and easier in the medium term. This restructuring will have effects on seed certification schemes in Europe.

The ECOM had prepared the question of finances very conscientiously, and our Secretary General's report revealed the financial situation of our association very clearly. There followed a difficult discussion, sometimes hard and sometimes with strong arguments against fee increases, but also with good ideas for cost savings. Finally, the voting delegates made a positive and highly responsible decision, which will allow us to go ahead with our projects. After the OM, the ECOM decided to give the highest priority to reducing costs and increasing income. In my letter of May this year, I had the opportunity to explain to all Member Laboratories and Designated Authorities the reasons for and consequences of the ECOM decision on increasing the audit fees from 1 January 2010.

The other important decision was to continue our GMO testing activity, but here again is a big challenge: how to cover the costs of the GMO proficiency tests.

In summary, the Annual Meeting 2009, thanks to the Voting Delegates and other Members, was a good technical event, and authorized the TCOM chairs and the ECOM to continue their work as declared in the ISTA Position Paper. In the current global situation, this is all we can hope for.

After the Zurich Meeting, some of us had only a short summer holiday before preparing for the next major event, the 2nd World Seed Conference in Rome, organized by the FAO, the OECD, UPOV, the IFS and ISTA.

This conference is a significant step in raising awareness of the importance of new plant varieties and high quality seed in a challenging global context, and how governments can support this. It will consist of a two-day Expert Forum followed by a one-day Policy Forum.

In the Expert Forum, I will be chairing Session 4: 'The importance of quality seed in agriculture'. From ISTA, there will be presentations by Alison Powell, Rita Zecchinelli, Michael Muschick, John Hampton, Joost van der Burg and Joël Léchappé.

In the Policy Forum, ISTA will be represented by our Secretary General Michael Muschick.

After the Conference, the 1st Vice-President, the Secretary General and I will take the opportunity to discuss how best to conclude this year with a positive outlook for the next. ■

The Keyence digital microscope in seed testing laboratories

Dr. Andrea Jonitz[1], Prof. Dr. Norbert Leist[2] and Christina Müller
[1]ISTA Personal Member and [2]ISTA past President and Honorary Life Member

Landwirtschaftliches Technologiezentrum
Augustenberg
Karlsruhe, Germany
Andrea.Jonitz@ltz.bwl.de
norbert.leist@botanik1.uni-karlsruhe.de

One of the major objectives in seed testing laboratories is the positive identification of seeds in purity tests and determinations of other seeds. The absence or presence of certain seeds such as weeds can determine whether seed lots may be imported into certain countries or not, if national regulations are restrictive.

Next to specialized literature, seed collections and herbaria are traditionally used for the precise identification of species. The major importance of seed collections is to allow the direct comparison of the unidentified seed with seeds from certified reference material.

To establish such a reference seed collection is a huge challenge, requiring first the collection and identification of plants, then the harvesting of the seeds – possibly from different plants at different stages of development, in order to show the variability. In further steps, the seeds must be dried carefully, processed (usually by hand), labelled, stored and protected from insects.

Nowadays, seed testing laboratories have the problem that seed collections are either not available for purchase, or only at high cost, and laboratories may not be able to afford a large number of species.

Technical progress has opened up new possibilities using photography and computer programs. They permit three-dimensional illustrations of seeds with a vivid view of the structure and surface, which even allows the identification of seeds by morphological characteristics. This creates the possibility of establishing a digital seed collection.

The major advantage of such a digital seed collection is that the seed characteristics needed for identification are all visible on the screen, without any further tools such as magnifying glasses or binocular microscopes being necessary. The quick use and availability of the data base at different locations in a lab are as convenient as the security in working with reference seeds, since there is no danger of returning seeds to the wrong box.

Maintenance of the seed collection is also easier. The shape and colour of the photos remains bright, and the visible seed characteristics remain unchanged, in contrast to real seeds, in which the process of ageing leads to shrivelling, loss of colour saturation or even change of colour. Also, data management is simple compared to a real seed collection, and such a photo collection may be continually expanded.

The Keyence digital microscope

The name "Keyence" stands for "key of science" a technique developed in 1974 in Osaka, Japan, originally for applications in industrial sensory and automation technology.

The Keyence digital microscope system consists of a tripod, a telephoto zoom lens, a personal computer with a high-resolution screen, and the necessary software to make and create three-dimensional images (Fig. 1). The system includes sources of cold light. The use of the Keyence is quite simple, and allows enlargements from 20–200× or 500–5000× in one operation.

Seed identification is usually carried out using characteristics such as size, shape, colour and especially structures of the seed surfaces, which in some cases may even be species specific. There are thus parallels between the use of the Keyence microscope in this biological field to its original technical application, which led to the initiation of the "Digital Seed Collection" project at the seed testing station of the Centre for Agricultural Technology Augustenberg, in Karlsruhe, Germany.

Working with the Keyence system

For best results with the Keyence microscope, the settings must be optimized to create the best conditions for displaying the morphological features necessary for species identification. For instance, lighting may be required which provides the right combination of light and shade to enhance the three-dimensional appearance, but which at the same time avoids bright reflecting spots on the shiny surfaces of seeds such as beans, millet or sorghum. The software then offers various interactive modes which are suitable for individual seed structures, as shown in the following examples.

Figure 1. The Keyence microscope (all photographs ©LTZ Augustenberg, Karlsruhe)

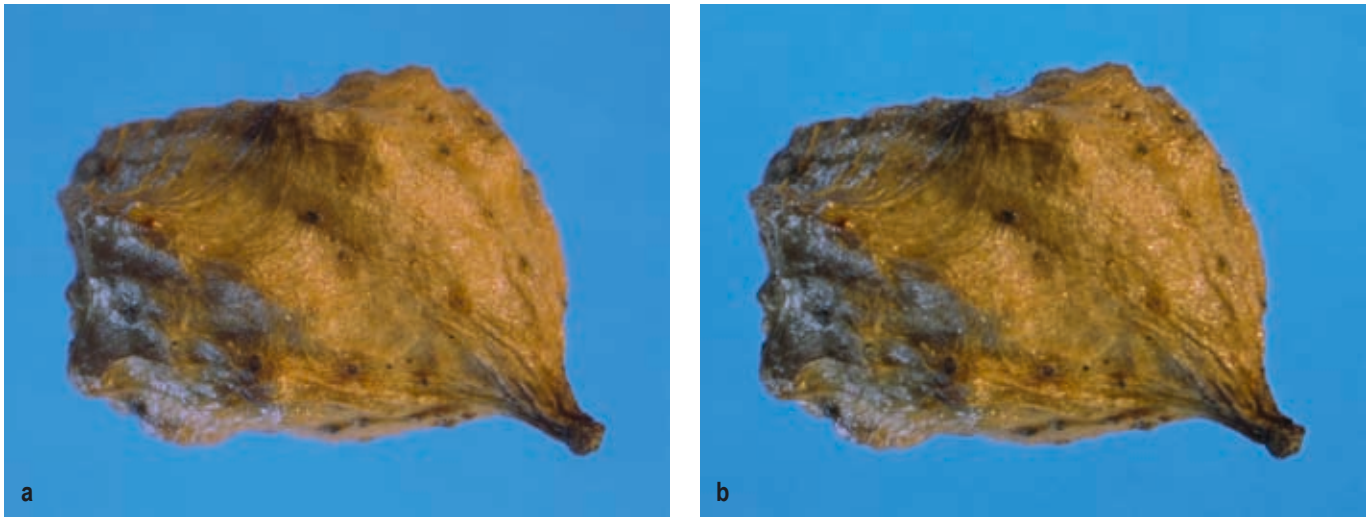

Figure 2. *Bunias orientalis*. **a** Normal mode. **b** 3CCD mode and pixel enhancement function (1600 × 1200 pixels).

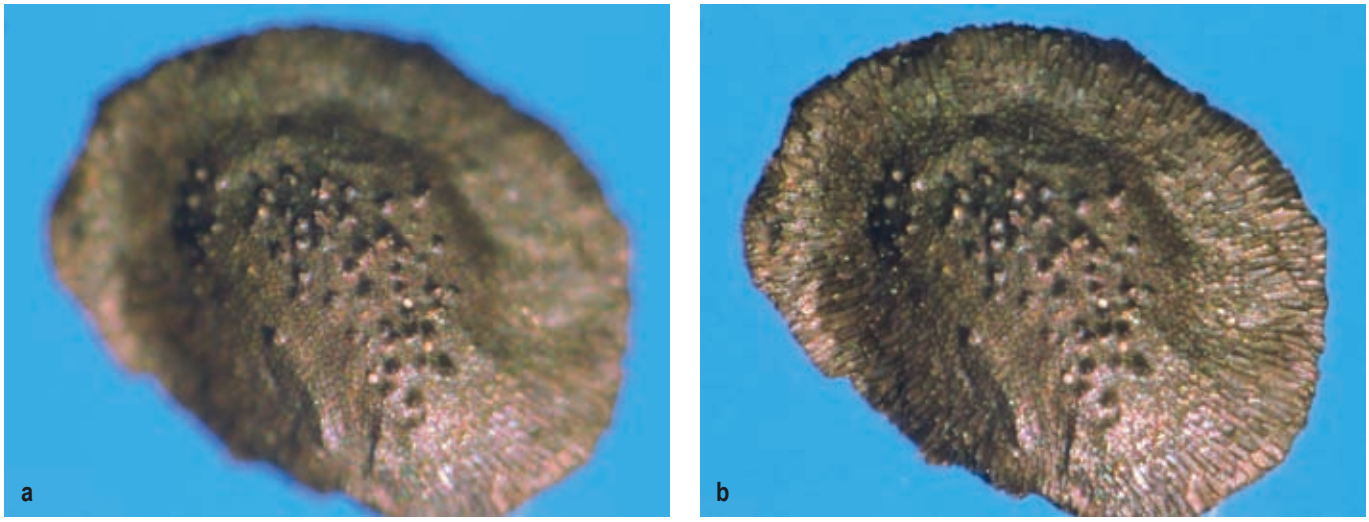

Figure 3. *Linaria*. **a** Normal mode. **b** Real-time Depth Composition mode using 11 individual images.

The pictures of *Bunias orientalis* (Fig. 2) are taken in normal mode (Fig. 2a) and in 3CCD mode, by using the pixel-shifting function (Fig. 2b). Both images have a size of 1600 × 1200 pixels. Figure 2b clearly shows an enhancement of quality.

The Real-time Depth Composition Mode combines and computes several single images, resulting in a three-dimensional view which gives very good results for complex surface structures that do not lie in one single plane of focus. Figure 3a shows a *Linaria* seed taken in normal mode, while Figure 3b demonstrates the Real-time Depth Composition Mode, in which 11 individual images have been combined. The result is an enormous quality increase which allows the whole surface of the seed to be shown in maximum focus.

Last but not least, we show some examples of the 3CCD mode (Fig. 4) and the Fine-Depth Composition Mode (Fig. 5).

Currently, seeds of most of the species on the ISTA Universal List of Species have been photographed and processed. In collaboration with the ISTA Purity Committee it is planned to publish the images and make them available to the seed testing laboratories as a valuable tool for seed identification. ■

Figure 4. 3CCD mode. **a** *Plantago lanceolatum*. **b** *Xanthium spinosum*.

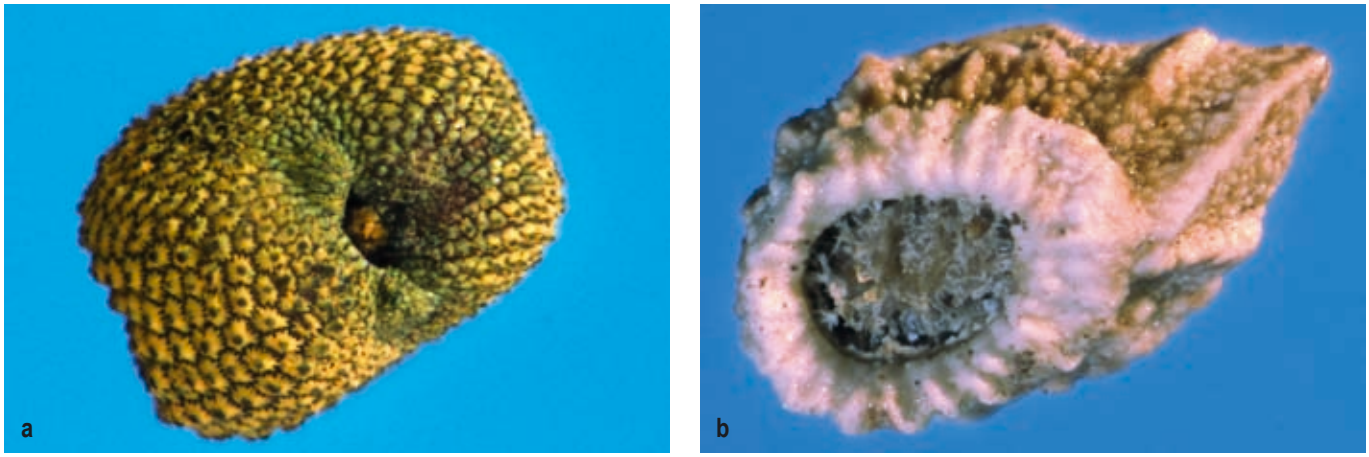

Figure 5. Fine Depth Composition mode. **a** *Silene noctiflora*. **b** *Anchusa arvensis*.

Report from the ISTA Annual Meeting 2009

ISTA Secretariat
8303 Bassersdorf, Switzerland
ista.office@ista.ch

This years' ISTA Annual Meeting was held from 15–18 June at the Hotel Novotel Zurich Airport at Glattbrugg, just outside Zurich, Switzerland. This was very much a "home game" for the Secretariat staff, Glattbrugg being only on the other side of the hill from the ISTA office at Bassersdorf.

However, some of the participants had already been there since the previous Thursday, having taken part in the ISTA Quality Assurance Workshop (see report on p. 43). The Executive Committee and Technical Committee Chairs were also already busy at work on the Saturday preceding the meeting.

But on the Sunday, the first official event of the Annual Meeting took place. Almost 90 participants from 37 countries attended the Seed Analyst Training Workshop (see report on p. 10). This was followed in the evening by the Welcome Cocktail.

The Monday was dedicated to the ISTA Seminar on Purity Testing, organized by the Purity Committee (see report on p. 13). In the evening, the Technical Auditors held their annual meeting (see report on p. 15).

On Tuesday, 16 June, the Annual Meeting 2009 was opened by ISTA President Katalin Ertsey, and began in earnest with the first presentations of the work of the Technical Committees. By now, around 200 participants from over 50 countries were making the ground floor of the Novotel a rather crowded place, especially during meals and coffee breaks, but this caused no problems for the competent hotel staff.

On the Tuesday evening, several Technical Committees held their own meetings. With most of them, if not all, having members from more then one continent, the Annual Meeting is one of the few occasions when they can get together in person.

The technical presentations continued until the Wednesday afternoon. The TCOM presentations can be downloaded from the ISTA web site at www.seedtest.org/am2009.

The working day was finished off by the meeting of the Rules Committee.

The Official Dinner of the Annual Meeting took place on the Wednesday evening. The guests were taken by coach halfway up the mountain which dominates the city of Zurich, the Uetliberg. A short train ride and walk then took them up to the summit, to enjoy a spectacular view over the city and Lake of Zurich, and then dinner at the Hotel Uto Kulm.

Everyone found their way back safely to the train in the dark, and so the next morning, the climax of the week, the Ordinary Meeting 2009, could begin.

The 1st Vice-President and President kick-off the Annual Meeting.

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Application support Europe, international: Tel: +49 1803 666 789 · E-mail: biochipsupport@eppendorf.de
North America: Tel: +1 800 645 3050 ext. 2258 · E-mail: support_na@eppendorf.com
Asia Pacific: Tel: +60 3 8023 6869 · E-mail: support_asiapacific@eppendorf.com

Every year. after the welcome by the President, a guest speaker is invited to give a talk on a topical subject. This year it was Garlich von Essen, Secretary General of the European Seed Association, who gave a presentation on "Breeding and seed production for the 21st century – challenges and expectations of the EU seed industry."

The meeting was then called to order, and the Voting Delegates got down to business. First were the reading of the Minutes of the Ordinary Meeting 2008, followed by the reports of the Executive Committee and the Secretary General.

There followed under Agenda point 7 a proposed change to the ISTA Constitution. This was to remove the position of Second Vice-President, appoint the person responsible for the organization of the next Congress as a Member-at-Large of the Executive Committee, and increase the number of Members-at-Large from eight to nine. This proposal was adopted with the required two-thirds majority, and will come into force at the next elections of the Executive Committee in 2010.

Next was a discussion about the decision of the Executive Committee to increase the accreditation fees, which had remained unchanged for the last ten years, and no longer covered costs.

Agenda point 8 was a proposal to increase the annual subscription by 2.4%, which in the current economic climate was a matter of some contention. However, it was clearly adopted.

The proposed budget for 2009 and preliminary budget for 2010 likewise generated some discussion, but were also adopted by applause.

Rules Chair Steve Jones (Canada) presided over the next item (Agenda point 9), the proposed Rules changes for 2010.

The vast majority of the proposals were accepted without much discussion, but there were exceptions. Proposal C.1.3 aimed to provide clarification on how to state 'Provisional' on 'Original' and 'Duplicate' ISTA certificates (Rule 1.4.1), but there were doubts whether the proposal achieved this satisfactorily, and in the end it was not accepted by the Voting Delegates.

There was also quite a good deal of discussion about Proposal C.4.1, concerning reporting the sample weight of Other Seeds by Number (Rule 4.7). This proposal was withdrawn.

The official dinner, high above Zurich at the summit of the Uetliberg.

The complete list of forthcoming changes to the ISTA Rules can be found on p. 11.

Agenda point 10 was the consideration and adoption of the Technical Committee reports. All the Chairs or their representatives were invited up to the stage to receive a small gift from the President.

The place and date of the next Ordinary Meeting (Cologne, Germany, 22 June 2010) was then officially announced by the Second Vice-President, Udo von Kröcher, who gave a short presentation on the 29th ISTA Congress and the host city (more information starting on p. 16). The convenor of the accompanying Seed Symposium, Alison Powell (UK), also gave a presentation on that important event.

The Secretary General then announced the place and date of the Ordinary Meeting for 2011, which shall be in Japan from 13 to 16 June.

He then informed the Delegates about the forthcoming 2nd World Seed Conference in Rome, which at the time of going to press had already passed. For a report on this important event, see p. 16.

As decided at the last Ordinary Meeting in Bologna, a Position Paper on ISTA's view regarding the units for the reporting of quantitative results on presence of seeds with specified traits in conventional seed lots was presented for voting. After a successful motion from the floor to remove the word "adventitious" from the title, the Position Paper was adopted.

Rita Zecchinelli (Italy) then reported on the Seed Analyst Training Workshop held on the previous Sunday, and presented a summary prepared by Pieter Oosterveld (Netherlands).

Following this, Joost van der Burg (Netherlands) gave a presentation proposing the introduction of ISTA certification of sublots, particularly for horticulture.

The last item Alison Powell then reported about improving collaboration and information flow between the Advanced Technologies Committee (ATC) and the Technical Committee Chairs. This would allow TCOMs with an interest in the technologies being evaluated by the ATC, allowing them to become involved if required.

Before closing the meeting, the President thanked all the participants for their hard work, fruitful discussions and important decisions during the week, and hoped to see them next year in Cologne.

The documents adopted by the Voting Delegates at the Ordinary Meeting 2009, as well as presentations given during the Meeting, can be downloaded from the ISTA web site at http://seedtest.org/en/om_approved_documents_content---1--1319.html. ■

Official photo of the participants of the Annual Meeting 2009.

ISTA Seed Analyst Training Workshop

John Hampton
ISTA 1st Vice-President and Chair, ISTA Seed Analyst Training Committee

Bio-Protection Research Centre
Lincoln University
7647 Lincoln, Canterbury, New Zealand
john.hampton@lincoln.ac.nz

The ISTA Seed Analyst Training Workshop was held in Zurich on 14 June 2009, in conjunction with the ISTA Annual Meeting 2009. A total of 87 active participants from 37 countries helped to make the day an undoubted success. The Workshop was moderated by ISTA's Immediate Past President, Pieter Oosterveld.

At the ISTA Ordinary Meeting 2008 in Bologna, it became clear that Members had very different opinions on the role of ISTA in seed analyst training and how it could be provided. The Workshop, therefore, had three major goals:

- to provide a comprehensive overview of seed analyst training needs, problems and opportunities around the world;
- to gather ideas on the possible format/content of any training programme;
- to provide recommendations as to how ISTA might best meet the needs of its Members with respect to seed analyst training.

John Hampton opening the SAT Workshop

After a brief introduction from SATC Chair John Hampton and the opening by moderator Pieter Oosterveld, the Workshop began with seed analyst training situation reports from around the world. The presenters were:

- Joël Léchappé (France): Western Europe
- Katalin Ertsey (Hungary): Eastern Europe
- Mary Chipili (Zambia): Africa
- Steve Jones (Canada) and Susan Maxon (USA): North America
- Monica Moreno (Argentina): South America
- John Hampton (New Zealand): Australasia
- Masatoshi Sato (Japan): Asia

Each of these presentations is available on the ISTA website (www.seedtest.org/en/workshopdetail---/--1113--210--68.html).

From these reports it became evident that training needs differ among ISTA's Member Laboratories, and that there is little uniformity in training. Some laboratories have well-structured training programmes and qualification processes, while others only have limited 'on-the-job' training of new analysts. Factors influencing the training available include geographical region, laboratory size, species being tested, training facilities and access to training materials in a language other than English.

Working groups

After lunch, the participants were organised into 10 working groups of 6-8 people under the leadership of Alison Powell (UK), Mary Chipili (Zambia), Monica Moreno (Argentina), Steve Jones (Canada), Anne Bülow-Olsen (Denmark), Susan Maxon (USA), Joël Léchappé (France), Katalin Ertsey (Hungary), Anny van Pijlen (Netherlands) and Ronnie Don (UK).

Each Working Group was provided with four topic areas for discussion:

1. What should ISTA's role in training be? Should ISTA develop a training framework or recognise specific courses and their content?
2. If ISTA were to have a common set of learning objectives for training, what should they be?
3. What approaches might be used to improve training availability to those regions which consider that provision is currently limited?
4. How could ISTA facilitate seed analyst training opportunities?

One and a half hours was allocated for this discussion, and the time was well used. The aim of these discussions was to collect the views and expectations of the Membership regarding seed analyst training, and leaders were careful to allow ideas to develop within their group. Once these ideas were formulated, they were summarised by the group leaders and presented to the participants via an oral report.

Note: the working group method has been little used by ISTA. Feedback from many Workshop participants was that they enjoyed the experience, particularly the opportunity provided to talk to other ISTA Members and share information and ideas.

Conclusions and recommendations

The reports from the working group leaders were summarised by the moderator, Pieter Oosterveld, and from them he produced a number of conclusions and recommendations regarding ISTA and seed analyst training. This document is also available on the ISTA website (www.seedtest.org/upload/cms/user/FinalISTASeedAnalystTrainingWorkshopReport090162.pdf).

Key conclusions were:

1. The management of a laboratory is responsible for training seed analysts, but ISTA could support management by providing a set of common learning objectives.
2. Recognition of existing training programmes was not considered a priority.
3. There was no support for an ISTA seed analyst qualification.
4. The SATC could co-ordinate the production of training material.
5. Laboratories should seek to co-operate in the provision of training wherever possible.
6. The 'train-the trainer' model should be considered as an option for some regions.

The recommendations were:

1. ISTA should recognise the diversity in training within ISTA's Member Laboratories when setting policy and strategy regarding seed analyst training.
2. ISTA should develop a common set of learning objectives for seed analyst training.
3. ISTA should continue to produce its technical handbooks and consider the possibility of producing a handbook for seed analyst training.
4. ISTA should develop ideas for producing training tools such as CDs.
5. ISTA should develop ideas for establishing a distance learning system for seed analyst training.
6. ISTA should provide a list of existing sources of information for seed analyst training and a list of experts who may be possible trainers.
7. ISTA should co-ordinate the activities for the production of new training material.
8. Laboratories should seek to co-operate (within a country or region) to strengthen training programmes for seed analysts.
9. In conjunction with interested countries/regions, ISTA could become a facilitator for the implementation of a 'train-the-trainer' structure.
10. Where there is a requirement for ISTA publications in a language other than English, the language group/region must organise translations according to current ISTA copyright policy.
11. ISTA should consider increasing its programme of workshops, seminars and symposia, and in doing so seek to increase co-operation with other organisations.
12. ISTA should continue its efforts to find external funding for training-related activities with the active co-operation of ISTA Members in countries/regions.

These Workshop outcomes have, therefore, provided guidance for the ECOM and the SATC as they seek ways to fulfil the current ISTA strategy regarding seed analyst training. How successfully this can be achieved will depend on the availability of funding, and most importantly, the active involvement of ISTA's Members.

Acknowledgements

On behalf of the SATC, I thank Pieter Oosterveld for his professional moderation and clear recommendations, our colleagues for their interesting seed analyst training situation reports, the working group chairs for demonstrating their excellent facilitation and reporting skills, and the participants who contributed their ideas so willingly. Thanks also, as usual, to the staff at the Secretariat, for without their input the Workshop would not have been possible.

Footnote

In Seed Testing International 137, April 2009, p. 18, reference was made to the Seed Analyst Training Questionnaire organised by the SATC. The Workshop Situation Report presenters used this questionnaire information when preparing their reports. An overview of the questionnaire responses (70 ISTA laboratories from 41 countries) can be found at https://www.seedtest.org/upload/cms/user/8SummaryofSATQuestionaire_JohnHamptonKompatibilittsmodus.pdf. ■

Changes to the *International Rules for Seed Testing* 2010 Edition

As every year, a number of proposals for changes and amendments to the ISTA *International Rules for Seed Testing* were proposed at the Annual Meeting under Agenda point 9.

Two proposals were not adopted. A change to Rule 1.4.1 aimed to provide clarification on how to state 'Provisional' on 'Original' and 'Duplicate' ISTA certificates. However, the Voting Delegates were not convinced that this was achieved, and it was not accepted.

A change to Rule 4.7, concerning the reporting of the sample weight of Other Seeds by Number, also generated some discussion, and in the end was withdrawn.

All other Rules proposals were accepted, in some cases after modification. The Rules proposals document, now containing only the accepted proposals, and with the modifications in green, can be downloaded from the ISTA web site at http://www.seedtest.org/en/om_approved_documents_content---1--1319.html.

The accepted proposals are listed below.

New species

– *Brachiaria brizantha*

Chapter 1: ISTA Certificates

1.3 Conditions for issuance of ISTA certificates: requirement for moisture-proof containers for moisture testing

1.4.2 Orange International Seed Lot Certificate: requirement for reporting the name of the sampling laboratory

1.5 Reporting results: revision and synchronization with corresponding paragraphs in other Chapters

Chapter 2: Sampling

2.2.11 Treated seed: revised definition of seed treatment
2.5.1.3 Taking primary samples: addition of spiral-slot sampling stick without compartments and cargo sampler, for seed smaller than *Triticum aestivum*, i.e. grasses and clovers
Table 2A: reduction of size of submitted sample for *Nicotiana tabacum* to 5 g
2.9.1.5 Heterogeneity testing for seed lots in multiple containers: new rule
2.9.2.5 Heterogeneity testing for seed lots in multiple containers: new rule

Chapter 3: The Purity Analysis

3.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 4: Determination of Other Seeds by Number

4.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 5: The Germination Test

5.9 Reporting results: revision and synchronization with Rule 1.5
Table 5A:
– Top of paper covered with sand (TPS) method for *Glycine max, Helianthus annuus, Phaseolus vulgaris* and *Zea mays*
– Between paper (BP) method for *Brassica* spp. and *Sinapis alba*
– Organic growing media (O) method for *Vicia faba*

Chapter 6: Tetrazolium Test

6.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 7: Seed Health Testing

7.2.3 Seed treatment: revision
7.6 Reporting results: revision and synchronization with Rule 1.5
7-026: New method: Detection of Squash Mosaic Virus, Cucumber Green Mottle Mosaic Virus and Melon Necrotic Spot Virus in cucurbits (can be downloaded free of charge at http://www.seedtest.org/en/content---1--1132--241.html

Chapter 8: Species and Variety Testing

8.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 9: Moisture Content

9.1.4.3 Containers: tight-fitting lids no longer necessary
9.1.5.1 General directions and precautions: retention of samples for re-testing, if required
9.1.5.6 Predrying: clarification
9.1.6.1 Constant-temperature oven methods: revision of calculation and expression of results
9.1.6.2 Tolerances: revision of calculation and expression of results
9.1.7 Reporting results: revision and synchronization with Rule 1.5
9.2.2.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 10: Weight Determination

10.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 11: Coated Seed

11.1 Objects: revision
11.1.1 Definitions: revision
11.3.7 Reporting results: revision and synchronization with Rule 1.5
11.4.7 Reporting results: revision and synchronization with Rule 1.5
11.5.8 Reporting results: revision and synchronization with Rule 1.5

Chapter 12: Excised Embryo

12.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 13: Weighed Replicates

13.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 14: X-Ray Test

14.7 Reporting results: revision and synchronization with Rule 1.5

Chapter 15: Seed Vigour Testing

15.2.4 Additional definitions: clarification of unit of measurement
15.8.1 Conductivity test: *Phaseolus vulgaris* validated
15.8.1.7 Calculation and expression of results: new guidelines on reporting results following a re-test
15.8.1.8 Reporting results: revision and synchronization with Rule 1.5
15.8.2.7 Calculation and expression of results: new guidelines on reporting results following a re-test
15.8.2.8 Reporting results: revision and synchronization with Rule 1.5
15.8.3 Controlled deterioration test for *Brassica* spp.: new vigour test validated
Table 15A: list of validated tests updated to include *Phaseolus vulgaris* and controlled deterioration test

Chapter 16: Tolerances

– Deleted, all tables having been moved to their respective Chapters

Chapter 16: Size Grading

Renumbered from Appendix A
Reporting results: revision and synchronization with Rule 1.5

Chapter 17: Bulk Containers

Renumbered from Appendix B
17.6 Reporting results: revision and synchronization with Rule 1.5

All ISTA Member Laboratories and Personal Members will receive their free copy of the Rules Amendments for 2010 by the end of October. ■

ISTA Purity Seminar

Jane Taylor
Vice-Chair, ISTA Purity Committee

NIAB Official Seed Testing Station for England and Wales
Cambridge, United Kingdom
jane.taylor@niab.com

The speakers at the Purity Seminar (from left): Norbert Leist, Adriel Garay, Jane Taylor, Maria Mannino, Joost van der Burg and Monica Moreno.

Each year, the ISTA Annual Meeting is accompanied by a seminar on one of the many aspects of seed testing. This year's event was organized by the ISTA Purity Committee, and covered a broad range of topics related to seed purity, presented by experts in the field to over 180 participants.

It was decided in 2007 that the objective of this seminar was to reflect the level of current knowledge in the field of purity, in particular with regard to pure seed assessment, seed identification and purity methodology.

The programme therefore included three sessions: firstly, on pure seed definitions (PSDs), which form the basis of purity analysis and methodology for particular groups of species; secondly, on seed identification and the impact of the ISTA Universal List of Species; and finally, on a new method for blower calibration, all of which are topics of great interest and importance for purity specialists.

In the first session, the first two presentations were given by Joost van der Burg, of Plant Research International at Wageningen, in the Netherlands. In the past, Joost van der Burg was leader of a Purity Committee Working Group on PSDs which produced the current edition of the ISTA Handbook on Pure Seed Definitions. His first presentation was on the history of the development of purity rules and PSDs, and on the considerations and criteria that should be observed in the development of PSDs: consumer preferences, technical and economical possibilities and reasonable analysis time.

In his second presentation, he explained the botanical background and terminology of the most important seed types, and explained some of the more complicated PSDs and lesser-known terms for the various parts of seed units.

The presentation on tropical and subtropical species was given by Monica Moreno of the Instituto Nacional de Semillas, Buenos Aires, Argentina, a current member of the Purity Committee. The development of ISTA Rules regarding tropical and subtropical species is one of ISTA's priorities, which is also reflected in the Purity Committee's working programme. The presentation illustrated the physiological basis and importance of *Panicum, Brachiaria* and *Chloris* for the tropical and subtropical regions, and the PSDs and main analysis difficulties for these genera.

The last topic of this session was the testing of forest tree and shrub species. It was presented by Zdenka Procházková, of the Forestry and Game Management Research Institute of Kunovice, Czech Republic, and Chair of the ISTA Forest Tree and Shrub Seed Committee. One particular issue of the presentation was the analysis of winged seeds of PSDs 47 and 51.

In the second session, on seed identification, Norbert Leist, of Seed testing and Quality Management of Bad Schönborn, Germany, spoke about the level of identification of seeds (species or genus) and tools for seed identification. Norbert Leist is a botanist; he has been President of ISTA and is a Life Honorary Member of the Association. The first lecture gave indications on the methodology that should be adopted to identify seeds, and also underlined the difficulties of identification at the species level. Some examples were illustrated with species on the Universal List.

The second lecture provided answers to some questions related to seed reference collections: where can seed samples be found for collections? How can they be checked and validated before being added to a collection? How can exchange of seed specimens be promoted? Which tools are available for seed identification (botanical keys, literature, web sites)?

Two presentations on the Universal List of Species followed. The first, on the purposes and perspectives of the Universal List, was presented by Maria Rosaria Mannino, responsible for the Physical Analysis Laboratory of the French National Seed Testing Station in Angers, and Purity Committee Chair. Information was given on the use of the List and its impact on ISTA laboratories: contents of seed collections, guidance of the ISTA Proficiency Programme and the level of seed identification.

This was followed by a lecture on training of seed analysts in seed identification,

presented by Jane Taylor of the National Institute of Agricultural Botany, Cambridge, UK, and Purity Committee Vice-Chair. This session was concluded by Norbert Leist with a lecture on species classification and nomenclature.

The last session of the seminar concentrated on the seed blowing of *Poaceae*, .and included two presentations and a demonstration on the new method for blower calibration. The session was presented by Adriel Garay of the Oregon State University in USA, who promoted this new method, which is already included in AOSA Rules.

The uniform blowing method is an important technological innovation for purity testing of grasses. It uses the concept of master calibration samples as the primary standard to find the calibration point in the blower, and the use of the equivalent air velocity (EAV) as the secondary or working standard. This presentation was followed by practical demonstrations. A second presentation by Adriel illustrated the steps needed to develop a procedure for new species: how to find the uniform blowing point (UBP), validate the UBP across samples, develop the master calibration samples, verify the uniformity of the master samples and carry out an inter-laboratory validation.

Adriel Garay demonstrating the new Uniform Blowing Procedure to an attentive audience.

A detailed report on the new method can be found on page 26.

Particular thanks are due to the ISTA Executive Committee and Purity Committee, which promoted and organized this initiative, to Silvia Zanetti and staff of the ISTA Member Laboratory at the Forschungsanstalt Agroscope Reckenholz-Tänikon (ART), for their help and loan of the seed blower equipment, to the ISTA Secretariat, which made it possible by co-ordinating all the logistical planning and preparations, and lastly to all the lecturers, who contributed with really interesting presentations to ensure the success of the seminar.

The Seminar presentations can be downloaded from the ISTA web site at https://www.seedtest.org/en/workshopdetail---1--1113--210--69.html. ■

ISTA Handbook on Seedling Evaluation: Amendments 2009 now available

The ISTA Germination Committee has worked on a revision to the ISTA Handbook on Seedling Evaluation, Third Edition 2006, since the ISTA Congress 2007, held in Iguaçu Falls, Brazil. The revision is included in the ISTA Handbook on Seedling Evaluation, Third Edition 2009, or is available separately as Amendments 2009 to the ISTA Handbook on Seedling Evaluation, Third Edition 2006.

The revision consists of three parts:

1. The addition of Section 4.6.4: Assessment of fresh seed. This new section gives a flow chart with step-by-step instruction on the assessment of ungerminated seeds at the end of a germination test.
2. The revision of Appendix 5: Illustrative Standard Operating Procedures (SOP), to include a flow chart that gives step-by-step instructions regarding the calculation of the water-holding capacity of growing media.
3. The addition of an Appendix 6: The 50% rule for the evaluation of foliated cotyledons. This gives guidance on the evaluation of seedlings with damaged, necrotic, decayed and discoloured tissue. Guidance on when actual cotyledon size or estimated cotyledon size should be used when applying the 50% rules is provided, as well as diagrammatic and photographic examples of the application of the 50% rule. This Appendix should be of particular use to those evaluating seedlings with physiological necrosis.

The Amendments 2009 can be ordered from the ISTA Secretariat, or from the ISTA web site at www.seedtest.org/bookstore. ■

Auditors' Meeting 2009

Mary Jane Kelly
ISTA System Auditor

ISTA Secretariat
8303 Bassersdorf, Switzerland
auditor1@ista.ch

The auditors gathered for an evening session at the ISTA Annual Meeting in Zurich this past June. The Auditors' Meeting has proven to be an excellent forum for auditors to discuss problems encountered during audits, and to harmonize their approach to different technical topics.

This year, there was an extraordinarily good turnout, including ten technical auditors and three guests, who were invited to take part in some of the discussion points. A general summary of changes in the Accreditation Department in the past year and the main outcome of the technical points discussed follows.

Auditing of GMO labs

The demand for genetically modified organism (GMO) audits is on the increase and, owing to the complexity of auditing this extensive field of biochemical testing, more trained GMO auditors are needed.

The first step to improving GMO audits would be to establish a comprehensive audit checklist for use by all. After a discussion on general problems in GMO testing, it was proposed to develop this common check list, and a working group was created for this purpose with five members, one being named as leader.

Projects and activities

This year, the format of audit documents and the method of reporting both to and from the laboratories have changed. An updated electronic approach has been implemented to save paper and speed up the process. In future, laboratories will be asked to return corrective action reports only in electronic versions (via e-mail). Accompanying annexes are to be sent as PDF, Word or Excel files etc. If there are many of these attachments, they should be converted to a compressed WinZip file for easier forwarding.

The Accreditation Department has decided to update the document "How to Respond to Audit Findings", which explains in detail how a laboratory should report back with their corrective actions. The new version will include an example of a completed form, and give a step-by-step description of the process, which should make the transition to this paperless reporting easy to follow.

The Accreditation Department also plans to update the document describing how a laboratory should produce and report performance data evaluation (PDE) results, for obtaining accreditation for tests under the performance-based approach (PBA).

The new draft version of the "Scope of Accreditation Policy" document was sent to the ECOM for approval shortly after the Ordinary Meeting.

Improving communication

To perform a good audit it is essential that auditors have access to all the documents from a laboratory's quality management system. Up to now, it has been a problem to obtain all the documents requested, especially those procedures dealing with general matters, prior to an audit. It was discussed whether the demand for a full content list of quality documentation should be added as a requirement to the Accreditation Standard, or whether the problem should be solved in another manner.

The Accreditation Department stressed that the language for accreditation within ISTA is English.

Technical issues

Vacuum counters

The auditors discussed the need for validation of vacuum planting equipment. It is important that it is used in such a way that it does not bias the result, e.g. by selecting light seeds. It was decided that the vacuum seed counter shall be calibrated like any other piece of equipment. The Germination and Bulking and Sampling Committees will be asked to look into this.

List of preferred methods

The need for having a list with all the laboratories' preferred methods (e.g. for germination) was discussed. It was the general opinion that this is expected, unless laboratories can demonstrate in other ways that their preferred testing methods are stated in standard operating procedures, work instructions or similar.

Washing of *Beta* seed

Washing of *Beta* seed must be done under running water. Changing the water every 15 minutes is not sufficient. The Germination Committee Chair informed the auditors that the word "may" regarding the temperature of the running water in ISTA Rule 5.6.3.3 will be changed to "must", and that tolerances will be added.

Checking new equipment purchased from the same manufacturer

The question was raised whether a laboratory purchasing several germinators from the same producer needs to make temperature profiles for all of them. It was decided that this is still a necessary procedure.

Conclusion

Once again the Auditors' Meeting was successful. The discussion of technical matters always enables a uniform approach when auditing and helps to streamline the process. After a fruitful meeting, the auditors went out for dinner together. ■

2nd World Seed Conference, Rome, 8–10 September 2009

World food security: urgent measures on seed needed

Urgent government measures and increased public and private investment in the seed sector are required for the long term, if agriculture is to meet the challenge of food security in the context of population growth and climate change. This was the declaration of the Second World Seed Conference held at the FAO Headquarters in Rome, September 8–10, 2009.

Governments are strongly encouraged to implement a predictable, reliable, user friendly and affordable regulatory environment to ensure that farmers have access to high quality seed at a fair price.-

In particular, FAO member countries are urged to participate in the internationally harmonized systems of the Organization for Economic Cooperation and Development (OECD), the International Union for the Protection of New Varieties of Plants (UPOV), the International Treaty on Plant and Genetic Resources for Food and Agriculture (ITPGRFA) and the International Seed Testing Association (ISTA).

Participation in those systems will facilitate the availability of germplasm, new plant varieties and high quality seed for the benefit of their farmers, without which their ability to respond to the challenges ahead will be substantially impaired.

The conference emphasized the important role of both the public and the private sectors to meet the challenges ahead and the benefits when the two work together.

The Second World Seed Conference emphasized that agriculture needs to provide sustainable food security and economic development in the context of current and future global challenges.

The Conference highlighted the critical role of new plant varieties and high quality seed in providing a dynamic and sustainable agriculture that can meet those challenges. It concluded that governments need to develop and maintain an enabling environment to encourage plant breeding and the production and distribution of high quality seed.

The global seed market has grown rapidly in recent years and is currently worth around US$37 billion. Cross border seed trade was estimated to be worth around US$ 6.4 billion in 2007.

The Second World Seed Conference was held at FAO headquarters from September 8–10 and organized in collaboration with the OECD, UPOV, ITPGRFA, ISTA and ISF.

Conference conclusions

- Plant breeding has significantly contributed and will continue to be a major contributor to increased food security whilst reducing input costs, greenhouse gas emissions and deforestation. With that, plant breeding significantly mitigates the effects of population growth, climate change and other social and physical challenges.
- ITPGRFA is an innovative instrument that aims at providing food security through conservation, as well as facilitated access to genetic resources under its multilateral system of access and benefit-sharing. The multilateral system represents a reservoir of genetic traits, and therefore constitutes a central element for the achievement of global food security.
- Intellectual property protection is crucial for a sustainable contribution of plant breeding and seed supply. An effective system of plant variety protection is a key enabler for investment in breeding and the development of new varieties of plants. A country's membership of UPOV is an important global signal for breeders to have the confidence to introduce their new varieties in that country.
- Seed quality determination, as established by ISTA, on seed to be supplied to farmers is an important measure for achieving successful agricultural production. The establishment or maintenance of an appropriate infrastructure on the scientific as well as technical level in developed and developing countries is highly recommended.
- The development of reliable and internationally acceptable certificates, through close collaboration between all stakeholders along the supply chain for varietal certification, phyto-sanitary measures and laboratory testing, contributes substantially to the strong growth in international trade and development of seed markets to the benefit of farmers.

ISTA	www.seedtest.org
ISF	www.worldseed.org
OECD	www.oecd.org/tad/seed
UPOV	www.upov.int
FAO	www.fao.org

29th ISTA Congress 2010
Cologne, Germany, 16–22 June 2010

Udo von Kröcher
ISTA 2nd Vice-President and Chair of the National Organizing Committee, President of the Federal Plant Variety Office

On behalf of the German Government, I cordially invite you to the 29th ISTA Congress 2010, which will take place at the Guerzenich Congress Centre, Cologne, Germany, from 16–22 June 2010.

Please visit our web site www.ista-cologne2010.de for online registration, and all information about the Congress, workshops, tours, accommodation, travelling and visas, and the city of Cologne itself.

Prior to the Congress, three ISTA Workshops will be held at various locations in Germany:

- ISTA Workshop on Species and Variety Testing and Protein Electrophoresis: Hanover, 11–13 June 2010;
- ISTA Workshop on Viability and Germination: Augustenberg (near Karlsruhe), 8–13 or 9–14 June 2010;
- ISTA Workshop on GMO testing: Oberschleissheim (near Munich), 8–13 June 2010.

From 23–25 June 2010, we are also offering three attractive post-Congress tours to Bavaria, Thuringia and Baden-Württemberg. All tours will offer visits to seed stations and companies, combined with sightseeing tours of local places of interest.

The Congress will also include a trade exhibition at the Guerzenich Congress Centre. The ISTA Congress is the most important event in the seed testing world, and is a unique opportunity for exhibitors and sponsors to present their products and services, and develop contacts with 600 international seed science professionals from organizations and laboratories worldwide.

Registration for the 29th ISTA Congress 2010 and for the pre-Congress workshops and post-Congress tours is now open. There are attractive fee reductions for early registration before 28 February 2010. The final deadline for registration is 15 May 2010. ■

Registration fees

Periods	Events	EARLY registration (up to 28 Feb 2010)	LATE registration (1 March 2010 and after)
ISTA Members			
16–22 June 2010	FULL Congress	550 €	750 €
16–20 June 2010	Seed Symposium & TCOM	500 €	700 €
19–22 June 2010	TCOM, Education, OM	450 €	650 €
Non-members			
16–22 June 2010	FULL Congress	825 €	1125 €
16–20 June 2010	Seed Symposium & TCOM	750 €	1050 €
19–22 June 2010	TCOM, Education, OM	675 €	975 €
Students			
16–20 June 2010	Seed Symposium & TCOM	150 €	150 €
Accompanying persons			
16–22 June 2010	FULL Congress	350 €	350 €
16–20 June 2010	Seed Symposium & TCOM	250 €	250 €
19–22 June 2010	TCOM, Education, OM	200 €	200 €

Registration at www.ista-cologne2010.de

The importance of the ISTA Congress

Nadine Ettel
ISTA Meeting Organizer

ISTA Secretariat
8303 Bassersdorf, Switzerland
meetings@ista.ch

Each year, the International Seed Testing Association holds an Annual Meeting, which includes, apart from the Ordinary Meeting (OM) of the Association and the meetings and reports of the Technical Committees, also a seminar and one or more workshops on various topics of seed testing. Every three years, however, a larger event is organized: the ISTA Congress.

There are two major differences between an Annual Meeting and a Congress.

The first is that the seminar is replaced by a Symposium, held over several days, to which interested scientists are invited to present papers or posters on one of the topics of the Symposium.

However, the main significance of a Congress is that it marks the end and beginning of the three-year term of office of the Executive Committee, and thus of the President and Vice-President.

The Executive Committee of ISTA is currently formed by the President, the 1st and 2nd Vice-Presidents and eight Members-at-Large. As a rule, the 1st Vice-President serves for three years, and then automatically becomes President for a further three years. The current 1st Vice-President, John Hampton (New Zealand), shall thus become the new President of the Association for the forthcoming three years.

Following the adoption by the Voting Delegates at the OM 2009 of changes to Articles VI, VII and VIII of the ISTA Constitution, which shall come into force at the discharge of the Executive Committee at the OM 2010, there shall be in future only one Vice-President. The person responsible for the organization of the following ISTA Congress shall in future be one of nine (previously eight) Members-at-Large.

Nominations for the posts of Vice-President and Members-at-Large may be submitted only by Designated Members present at the Congress, and must be received by the Secretary General at the latest on the day before the Ordinary Meeting. The election of the Executive Committee takes place in the afternoon of the Ordinary Meeting. Detailed information about "How to become a Member of the ISTA Executive Committee" and "How to become an ISTA Voting Delegate at the Ordinary Meetings" can be found on pages 22–23.

The election is highly important for the future development of the Association. The Executive Committee must ensure that all decisions made during the Ordinary Meeting are implemented, and that the Association acts in the interests of its Members. The Executive Committee shall manage and direct the affairs of the Association according to the provisions of the constitution. Responsibility for the finances of the Association also rests in the Executive Committee. Furthermore, it is the responsibility of the Executive Committee to approve interpretations of the International Rules for Seed Testing, when need therefor arises, after consulting the Technical Committees concerned. The Executive Committee is empowered to approve and publish Accreditation Standards, to accredit Member Laboratories and to authorize such laboratories to issue ISTA Certificates.

Another important matter during the Congress is the election or re-election of the ISTA Technical Committee Chairs and Members for the following three years. The main duty of the Technical Committees is to develop, standardize and validate methodologies for seed testing and sampling, using the best scientific knowledge available. Another is to organize symposia, seminars and workshops all over the world to promote research in all areas of seed science and technology. Technical Committee Members also work on ISTA Handbooks on seed methods, including sampling, testing and processing seeds. During the Congress, the Technical Committees discuss their new terms of reference and their new strategies for the following three years.

Further information about the work of the ISTA Technical Committees and how to become a member of a committee can be found on the ISTA web site.

The Congress provides the opportunity to socialize with other seed experts and to exchange experiences. Participants will be informed about the recent developments in seed science and technology. In particular, the Symposium provides a platform for the presentation and discussion of the latest developments in applied seed science.

Do not miss the chance to attend this Congress, where decisions will be taken which will greatly influence the future of the Association. Your participation will be most appreciated, and we would be pleased to welcome you in Cologne. Please visit the Congress web site (www.ista-cologne2010.de) for registration and all the latest information.

Early registration deadline: 28 February 2010

Preliminary programme

Tuesday 15 June 2010

14:00–17:30 Registration desk open

18:30 Welcome Reception in the foyer of the Guerzenich

Wednesday 16 June 2010

Seed Symposium day 1

07:00–08:30 Registration desk open

08:30–09:30 Opening Ceremony

09:30–10:00 The Seed Industry in Germany

10:00–10:30 Coffee break

10:30–11:00 Opening of the Seed Symposium

11:00–12:30 Session 1
Chair: P. K. Agrawal, India
Technologies for improved seed supply: keynote paper, papers 1–4

12:30–14:00 Lunch break

14:00–14:30 Session 1
Technologies for improved seed supply: papers 5–6

14:30–15:30 Poster session 1

15:30–16:00 Coffee break

16:00–17:30 Poster session 1 (continued)

Thursday 17 June 2010

Seed Symposium day 2

08:30–10:00 Session 2
Chair: E. Noli, Italy
Aspects of purity: genetic, technical and physical: keynote paper, papers 1–3

10:00–10:30 Coffee break

10:30–11:30 Session 2
Aspects of purity: papers 4–6

11:30–12:30 Poster session 2

12:30–14:00 Lunch break

14:00–15:00 Poster session 2 (continued)

15:00–15:30 Session 3
Chair: G. Leubner, Germany
Basic approaches to physiological processes in seeds: keynote paper

15:30–16:00 Coffee break

16:00–17:30 Session 3
Chair: G. Leubner, Germany
Basic approaches to physiological processes in seeds: papers 1–3

Friday 18 June 2010

Seed Symposium day 3

08:30–09:30 Session 3
Chair: G. Leubner, Germany
Basic approaches to physiological processes in seeds: papers 4–6

09:30–10:00 Session 4
Chair: J. Léchappé, France
Approaches to the evaluation and improvement of germination: keynote paper

10:00–10:30 Coffee break

10:30–12:30 Session 4
Chair: J. Léchappé, France
Approaches to the evaluation and improvement of germination: papers 1–6

12:30–14:00 Lunch break

14:00–18:00 Registration desk open

14:00–15:30 Session 5
Chair: S. Matthews, United Kingdom
Assessment and improvement of seed performance in practice: keynote paper, papers 1–3

15:30–16:00 Coffee break

16:00–17:00 Session 5
Chair: S. Matthews, United Kingdom
Assessment and improvement of seed performance in practice: papers 4–6

17:00–17:30 Conclusion of the Symposium

19:00 Official Dinner at the Tanzbrunnen Köln

Saturday, 19 June

Presentation of ISTA's technical work

07:00–08:00 Registration desk open

08:00–09:00 Bulking & Sampling Committee
Chair: Leena Pietilä, Finland

09:00–10:00 Flower Seed Committee
Chair: Zita Ripka, Hungary

10:00–10:30 Coffee break

10:30–11:30 Forest Tree & Shrub Seed Committee
Chair: Zdenka Procházková, Czech Republic

11:30–12:30 Germination Committee
Chair: Ronald Don, United Kingdom

12:30–13:30 Lunch break

13:30–14:30 Moisture Committee
Chair: Craig R. McGill, New Zealand

14:30–15:30 Statistics Committee
Chair: Jean-Louis Laffont, France

15:30–16:00 Coffee break

16:00–17:00 Variety Committee
Chair: Berta Killermann, Germany

17:00–18:30 GMO Task Force
Chair: Christoph Haldemann, Switzerland

Sunday, 20 June

Presentation of ISTA's technical work

08:00–09:00 Purity Committee
Chair: Maria Rosaria Mannino, France

09:00–10:00 Seed Health Committee
Chair: Theresia A. S. Aveling, South Africa

10:00–10:30 Coffee break

10:30–11:30 Seed Storage Committee
Chair: Hugh W. Pritchard, United Kingdom

11:30–12:30 Tetrazolium Committee
Chair: Stefanie Krämer, Germany

12:30–13:30 Lunch break

13:30–14:30 Vigour Committee
Chair: Alison A. Powell, United Kingdom

14:30–15:30 Nomenclature Committee
Chair: John H. Wiersema, USA

15:30–16:00 Coffee break

16:00–18:30 Rules Committee
Chair: Steve Jones, Canada

Monday, 21 June

08:00–09:30 Training and Education (Seed Analyst Training, Education, Workshops)

09:30- 10:00 Coffee break

10:00–11:30 Laboratory Accreditation & Quality Assurance Programme (Proficiency Test, Audit Programme)

11:30–13:00 Requirements for Rules and Method Development Committee (Advanced Technologies)

13:00–14:00 Lunch break

14:00–15:30 **Policy Forum**
Harmonized seed testing and global seed trade.

15:30–16:00 Coffee break

16:00–18:00 **Policy Forum**
Harmonized seed testing and global seed trade
(continued)

18:00–21:00 Reception hosted by the BMELV

Tuesday, 22 June

ISTA Ordinary Meeting

08:30–08:45 Welcome by ISTA President
Dr. Katalin Ertsey

08:45–09:30 Presentation on the development of the seed industry in Germany, Europe and worldwide
(speaker to be decided)

09:30–10:00 1. Call to order
2. President's address

10:00–10:30 Coffee break

10:30–12:30 3. Roll call of Designated Members entitled to vote
4. Reading of Minutes
5. Report of the Executive Committee
6. Report of the Secretary General
7. Election of Officers & Members-at-large of the Executive Committee
8. Fixation of the Annual Subscriptions

12:30–13:30 Lunch break

13:30–15:30 9. Constitution changes
10. Consideration and adoption of the proposed Rules Changes 2010
11. Consideration and adoption of reports
12. Announcement of the place and date for the next Ordinary Meeting of the Association
13. Any other business raised by a Member, of which notice in writing has been received by the Secretary General two months prior to the date of the meeting

15:30–16:00 Coffee break

16:00–17:30 14. Any other business raised by consent of the Executive Committee
15. Discharge of the Executive Committee
16. President's closing address
17. Installation of new Officers
18. Adjournment

Registration at www.ista-cologne2010.de

Preparation for the 29th ISTA Seed Symposium 16–18 June 2010

Alison Powell
ISTA Executive Committee Member, ISTA Seed Vigour Committee Chair and Seed Symposium Convenor

School of Biological Sciences
University of Aberdeen
Aberdeen, AB24 3UU, UK
a.a.powell@abdn.ac.uk

ISTA Seed Symposium: "Application and improvement of established and advanced technologies in seed testing"

Session 1: Technologies for improved seed supply

Session 2: Aspects of purity: genetic, technical and physical

Session 3: Basic approaches to physiological processes in seeds (in collaboration with the International Society for Seed Science)

Session 4: Approaches to the evaluation and improvement of germination

Session 5: Assessment and improvement of seed performance in practice

Submission of abstracts for the 29th ISTA Seed Symposium is now complete, and the Scientific Programme Advisory Committee (SPAC) is busy evaluating the abstracts and selection of abstracts for presentation. We have received over 130 offers of oral papers, and over 115 offers of poster presentations. These originate from throughout the ISTA membership in all continents and from scientific institutions that carry out research in seed science and technology. It is pleasing to see that the theme of the Symposium, 'Application and improvement of established and advanced technologies in seed testing', is well reflected in the topics of the abstracts, with a good balance between the further development of established methods of seed testing and the development and application of new technologies.

Selection of papers for oral presentation

Now we have all the abstracts, we have to select those that will form the basis of the oral sessions in the programme. This selection follows a two-stage process. First, each abstract is sent to an appropriate member of the SPAC, who will have experience or knowledge of the topic area. The abstracts are then assessed on the basis of a number of criteria. We consider whether the topic is likely to be of particular interest to Symposium participants: for example, is it a subject of current interest? A new approach? Significant for many species? Does it have potential for major development in applied seed science? We then look at the abstract itself and ask whether the objectives of the work, what was done, the key findings and the conclusions are clear. Then we consider whether the findings are scientifically substantial and/or useful to seed technology, and whether the work described adds to our understanding of the problem. Each abstract is given a rating on the basis of these criteria.

The selection process then enters the second phase. During this, the authors of the most highly rated abstracts are asked for further details of the research that they will present in their paper. This can be submitted in a variety of forms: as a written paper, a PowerPoint presentation, or a series of figures and tables. Any format is acceptable, as long as we can see the detail of the work. Now, we have to select from papers that usually represent detailed and logical scientific research. At this stage, the chairperson and lead speaker for the session may choose to be involved in the selection of papers for their session. Selection of oral papers from these is a difficult task. Of course we must consider the quality of the work in the papers. However, we must also consider which combination of papers will make for an interesting and stimulating session, provide a balance of topics that are relevant to ISTA, and represent the diversity of both ISTA membership and the species with which ISTA Members work.

We hope that by 1 November 2009 we shall be able to inform everyone who has submitted an abstract for potential oral papers whether or not their paper has been accepted for oral presentation. Presenters of oral papers must register for the Symposium by 1 February 2010, so that they have three months in which to secure funding to attend. We have this deadline so that we are sure that the presenters of all oral papers will be able to attend the Symposium and there will not be a gap in the programme. If an author has not registered by this date, we shall have to replace the paper in the programme.

The authors of papers that have not been accepted for oral presentation will be invited to present their work as a poster. This invitation must be accepted by 1 March, and at least one author of the poster must register for the Symposium by 2 April. This does seem like a lot of deadlines, but our aim is to ensure that the abstract booklet only includes abstracts of posters that are presented, and also that there are no gaps where authors of potential posters do not actually attend.

Seed Symposium awards

At each Seed Symposium, there are awards for the three best oral presentations and the three best posters. These are selected by the members of two committees, one for each form of paper. These committees are given guidance regarding the assessment of both the oral papers and the posters. When the authors receive confirmation of acceptance of their oral papers or posters, they will be given details of what the committees are looking for. In addition, the criteria on which the papers are judged will be uploaded to the ISTA web site before the Symposium. The awards will be presented at the Congress Dinner. This, we hope, will be a celebration to end a successful Seed Symposium for all involved. ■

How to become a Member of the ISTA Executive Committee

Michael Muschick
ISTA Secretary General

ISTA Secretariat
8303 Bassersdorf, Switzerland
ista.office@ista.ch

The ISTA Executive Committee members have a high responsibility towards the ISTA Membership regarding the future development of the Association. The concrete tasks of the Executive Committee are laid down in the ISTA Constitution Article VII.

The Executive Committee holds personal meetings three times a year: two meetings in conjunction with the ISTA Annual Meeting, and a three-day business meeting at the beginning of the year.

The Executive Committee consists of the President, the First Vice-President, the Second Vice-President and eight Members-at-Large. According to the decision taken by the ISTA Voting Delegates at the Ordinary Meeting 2009, the Executive Committee will in future consist of the President, the Vice-President and nine Members-at-Large. This change will come into force with the election of the Executive Committee for 2010–2013, which will take place during the Ordinary Meeting 2010.

If you wish to become a member of the Executive Committee, you need:

- to become a Personal Member of the Association;
- to be nominated by your Government to represent this government in the affairs of ISTA – meaning that you need to become a 'Designated Member';
- to be nominated as candidate for the Executive Committee during the ISTA Congress;
- to be elected by the ISTA Ordinary Meeting as a member of the Executive Committee.

How to become a Personal Member

If you wish to become a Personal Member, you have to apply for personal membership through the ISTA Secretariat.

The Secretariat will send you the appropriate application documents. The Executive Committee decides on your application to become a Personal Member.

How to become a Designated Member

Designated Members are Personal Members who have been nominated by their Government to represent the Government in the affairs of ISTA.

The ISTA Secretariat can provide the Personal Member with the address of the relevant governmental authority (= Designated Authority) in their country which has the authority to designate Personal Members as Designated Members. The designation process for becoming a Designated Member is a country-specific procedure in which ISTA bodies are not involved.

How to become nominated as candidate for the Executive Committee

Any Designated Member can become a candidate for the Executive Committee or the position of the Vice-President through nomination by two other Designated Members, neither of whom needs to be from the same country as the candidate.

At the beginning of each ISTA Congress, application forms for the nomination of candidates for the Executive Committee and the Vice-President are available at the booth of the ISTA Secretariat.

The name of the candidate and his personal ISTA code (e.g. XXDM01) must be stated on the application form, together with the names and personal ISTA codes of two other Designated Members from the same or from a different country who are supporting the candidate.

The application form is only valid with these names and codes. Designated Members can be identified by the corresponding indications on their name tags.

The completed application forms must be returned to the booth of the ISTA Secretariat at the latest by the day before the Ordinary Meeting, as will be announced during the Congress.

How to become a member of the Executive Committee

The ISTA Secretariat will check the validity of the application forms received, and from the list of valid applications will form a list of candidates for the Executive Committee and the position of the Vice-President.

This list will be presented to the Voting Delegates and Members at the Congress, before the Ordinary Meeting.

Candidates will have time to introduce themselves during the Ordinary Meeting.

After this introduction of the candidates, the election process takes place. The identified Voting Delegates will receive, together with their voting documents, two voting sheets: one for the Vice-President, and one for the nine Members-at-Large.

First, the election of the Vice-President takes place. Voting Delegates must enter the name of their preferred candidate for this position on their voting sheets. The Vice-President is elected by a simple majority.

After the election of the Vice-President, all other candidates are automatically placed on the list of candidates for Members-at-Large. From this list, Voting Delegates may choose nine names to enter on their voting sheets. The nine candidates with the highest numbers of votes are elected as members of the Executive Committee.

The newly elected Executive Committee is installed at the end of the Ordinary Meeting, and holds its constitutive meeting on the day directly after the Ordinary Meeting. ■

How to become an ISTA Voting Delegate at the Ordinary Meeting

Michael Muschick
ISTA Secretary General

All decision making power within ISTA lies in the hands of the Governments (Article IX (a) ISTA Constitution).

It is up to each Government to decide whether it wants to exercise its voting rights.

This governmental decision has no influence on the decision of a laboratory or a person to become a Member of the Association, to use the services provided by the Association or to participate in the work of the Association.

If a Government wishes to exercise its voting rights within ISTA, that Government needs to:

- ensure that at least one seed-testing expert in the country is an ISTA Personal Member;
- designate at least one Personal Member to represent that Government in the affairs of the Association (designated Personal Members are referred to as 'Designated Members');
- nominate one Designated Member to exercise the voting rights on behalf of that Government for each ISTA Ordinary Meeting.

In other words, Personal Members wishing to exercise voting rights on behalf of their Governments at the Ordinary Meeting need to:

- have a designation from their Government to represent that Government in the affairs of the Association (= become Designated Member);
- be nominated each year by their Government to exercise the voting rights on behalf of their Government at the Ordinary Meeting.

How to become a Personal Member

If you wish to become a Personal Member of ISTA, you must apply for personal membership through the ISTA Secretariat.

The Secretariat will send you the appropriate application documents, or you can download them from the ISTA web site. The Executive Committee will decide on your application to become an Personal Member.

ISTA Delegates voting for the Executive Committee at the 28th ISTA Congress in Brazil.

How to become a Designated Member

Designated Members are Personal Members who have been nominated by their Governments to represent those Governments in the affairs of ISTA.

The ISTA Secretariat can provide Personal Members with the address of the relevant governmental authority (= Designated Authority) in their country which has the authority to designate Personal Members as Designated Members. The designation process for becoming a Designated Member is a country-specific procedure, in which ISTA bodies are not involved.

How to be nominated as a Voting Delegate

At the beginning of each calendar year, the ISTA Secretariat sends out letters to each Designated Authority, asking them to nominate one Designated Member to exercise the voting rights at the Ordinary Meeting for that year.

Therefore, before each Ordinary Meeting, the ISTA Secretariat has a list of names of Designated Members who are entitled to vote at the Meeting on behalf of their Governments.

If a Designated Authority does not give any indication as to who should execute the voting rights, a Designated Member wishing to exercise the voting rights for their country must provide a letter from their Designated Authority which indicates that they have been nominated as Voting Delegate for that meeting. This letter must be submitted to the ISTA Secretary General at least 24 hours before the start of the Ordinary Meeting.

Before the Ordinary Meeting, the nominated Voting Delegates must collect their voting cards at the ISTA Secretariat desk. The voting rights can then be exercised on behalf of that Government. ■

ISTA membership changes

Status 1 September 2009

New members

Brasil BRAM0003

Ms. Maria Laene Carvalho
Universidade Federal de Lavras (UFLA)
Lavras, MG, 37200-000
Phone: +55 35 829 1315
Fax: +55 35 8291100
Mail: mlaenemc@ufla.br

Denmark DKPM0007

Ms. Birte Boelt
Aarhus University, Genetics and Biotechnology
Research Centre Flakkebjerg
Forsøgsvej 1, 4200 Slagelse
Phone: +45 8999 3626
Fax: +45 8999 3501
Mail: Birte.Boelt@agrsci.dk

France MRML0900/FRML0901

Syngenta Seeds SAS
Laboratory representative:
Ms. Nathalie Danezan
Route de Francescas, 47600 Nerac
Phone: +33 562 626 024
Fax: +33 562 625 511
Mail: nathalie.danezan@syngenta.com

Germany DEPM0008

Mr. Werner Kloiber
KWS Mais GmbH
Grimsehlstrasse 31, 37574 Einbeck
Phone: +49 172 532 79 12
Fax: +49 5561311323
Mail: w.kloiber@kws.com

Russia RUML0400/RUML0401

Belgorod Interregional Veterinary Laboratory
Federal Service on Veterinary & Phytosanitary Supervision, Ministry of Agriculture
Laboratory representative: **Mr. Sergey Noskov**
Studencheskaya str 32, Belgorod, 308800
Phone: +7 4722 34 11 15
Fax: +7 4722 34 92 79
Mail: noskovvetlab@yandex.ru

RUML0500/RUML0501

Analytical Laboratory for Production Safety Estimation
Laboratory representative:
Ms. Elena Tkachenko
Neftegazosiemki Street, 11/41
Ramenskoe, 140100
Phone: +7 495 556 24 73
Fax: +7 49646 309 65
Mail: filitsina@ya.ru

Tajikistan TJML0100/TJML0101

Republican Seed Inspectorate
Central Seed Laboratory
Laboratory representative:
Ms. Favzia Gulomalisho
Mirzobek set. 1, 734063 Dushanbe
Phone: +99 237 225 8249
Fax: +99 237 221 16 28
Mail: seedtajikistan@gmail.com

Membership cancellations

Pakistan PKAM0002

Irfan Afzal
University of Agriculture, Crop Physiology
Faisalabad, 38040
Phone: +92 41 9200161
Fax: +92 41 9201098
Mail: irfanauf@gmail.com

United Kingdom GBAM0007

Mr. Sam Firkins
Maelor Forest Nurseries Ltd.
Fields Farm, Bronington
Whitchurch SY13 3HZ
Phone: +44 1948 710606
Fax: +44 1948 710440
Mail: sfirkins@maelor.co.uk

Eppendorf's EU validated DualChip® GMO Microarray Kit

After the successful market entry of the DualChip® GMO Microarray in 2006, Eppendorf has now launched the 2nd version of this product.

The product is used as a screening tool for EU-authorized and non-authorized GMOs (genetically modified organisms) in food, feed and seed. As a complementary technology to established PCR methods, the tool enables the parallelized screening for multiple transgenic elements in one experiment.

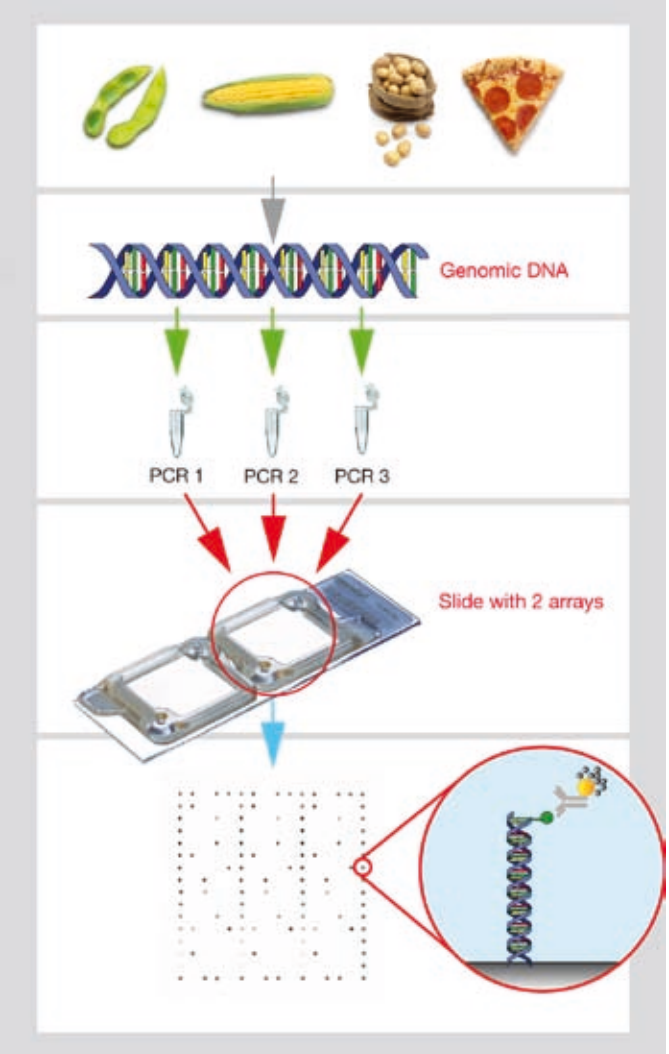
Features like the amplification of target DNA via multiplex PCR reactions, hybridization of the amplicons on the DualChip and visualization of the hybridized targets using Eppendorf's Silverquant® system remained basic elements of the product.

The most important modification is related to the content of the microarray: The number of targets was increased from 14 to a total of 30. The unique combination of screening elements (transgenic elements commonly used in plant GMOs and plant-species markers) and event-specific markers for detection of specific GMOs provides the most comprehensive screening tool currently available.

All 30 targets are amplified by only 3 multiplex PCR reactions (7 to 12 targets each) which are then merged and simultaneously detected on one DualChip microarray, a polymerase mastermix ensures convenient handling and an easy-to-use software tool generates ISO17025-conform reports within a few clicks.

The DualChip GMO Microarray technology was successfully validated in 2007 in a ring-trial study coordinated by the Joint Research Centre (JRC) of the European Union (http://bgmo.jrc.ec.europa.eu/home/docs.htm).

For further information please go to www.eppendorf-biochip.com or contact biochipsystems@eppendorf.de. ■



Development of a uniform blowing procedure for grass seeds: principles, applications and benefits

Adriel Garay[1], Sabry G. Elias[1] and Deborah J. Lionakis Meyer[2]

[1]Oregon State University
Seed Laboratory
Corvallis, OR 97331-3002, USA
adriel.garay@oregonstate.edu

[2]California Department of Food and Agriculture
Plant Pest Diagnostics Center
Sacramento, CA 95832-1448, USA
dmeyer@cdfa.ca.gov

Necessity and opportunities to innovate purity testing methods

Many grass species are becoming important in domestic and international markets. In the United States, grasses such as *Bromus hordeaceus*, *Bromus inermis*, *Deschampsia cespitosa*, *Echinochloa frumentacea, Festuca arundinacea*, *Lolium multiflorum, Lolium perenne, Koeleria macrantha, Paspalum vaginatum, Poa nemoralis, Poa secunda* and many others are marketed. In other areas around the world, *Brachiaria* spp., *Chloris* spp., *Panicum* spp. and many other tropical grasses are also of great significance. Traditional purity testing methods for grass seeds are very labor intensive, requiring visual differentiation of the seed units by presence, absence or size of the caryopses. This reduces laboratory efficiency and creates a risk of variability due to the subjectivity of human interpretation.

The domestic and global seed industries depend on accurate and standardized testing procedures to make sound marketing decisions based on reliable laboratory test results. However, in some grass species it is difficult, and sometimes impossible, to discern whether a structure that looks like a seed really contains an embryo and endosperm, and hence has any planting value. If seed units lacking properly developed caryopses are included in the pure seed component, this erroneously increases the pure seed percentage in a purity analysis. Furthermore, if such seed units are present in the pure seed fraction in large numbers and are planted for germination testing, the germination test result would be incorrectly lowered. To resolve the issues associated with subjectivity, potential variability, test inefficiency, and potential economic loss because of misleading test results, innovations in seed testing methods must be developed. One possible solution is to expand the use of seed blowers in purity testing.

The uniform blowing procedure (UBP) is not a new concept. It has been used to separate lightweight inert matter in *Dactylis glomerata*, *Poa pratensis*, and other grass species by AOSA and ISTA laboratories for many years. In 2006, the AOSA innovated the existing method by introducing the master calibration samples (MCS) concept to assure uniformity in separating lightweight inert matter by various General-type blowers in laboratories. The improved method also incorporated the use of equivalent air velocity (EAV) values to reproduce the optimum blowing point for daily operations of purity testing. Studies using the revised AOSA UBP blowing procedure have demonstrated a reduction in variability among laboratories. The authors believe that seed purity testing can be significantly improved by expanding the use of the UBP for other grasses, as well as non-grass species.

The purpose of this article is to present the UBP concept and its critical elements in a stepwise manner, using *F. arundinaceae* (tall fescue) as an example. It is written especially for readers who may be working with grass seeds around the world, but who may not yet be familiar with the technological advantages presented by this procedure.

Separation of lightweight inert matter based on developmental and physical attributes

There is abundant scientific and empiric evidence that the stage of seed development has a direct influence in the functional value of a seed, i.e. the capacity of a seed to germinate and produce a plant. A tall fescue seed unit lacking a caryopsis does not have any planting value and is considered inert matter. Only seed units containing caryopses with mature embryos and sufficient endosperm development have the capacity to produce plants. Based on this general principle, both the AOSA and the ISTA Rules have adopted a definition of pure seed for tall fescue in which the seed unit must contain a caryopsis that is at least one-third the length of the palea measured from the base of the rachilla (Fig. 1).

The structures considered to be inert matter in Figure 1 have a much lower density than the florets considered to be pure seed; therefore, they have a lower terminal velocity when placed in a column of air in a seed blower. Lower terminal velocity means that the undesirable inert florets can be removed from the sample by using the appropriate air velocity (i.e. air speed within the column controlled by the air-gate opening of a blower). When the correct air velocity is found, materials with lower terminal velocity are blown out into the inert matter capture pan (light fraction), whereas well-developed heavy seeds are retained in the sample cup of the blower and are classified as pure seed (heavy fraction). The significant differences in 100-seed weights of florets from the light and heavy fractions following the UBP are shown in Figure 2. When the UBP is properly performed under controlled conditions, i.e. using a properly calibrated blower, with the recommended sample size (AOSA or ISTA Rules) and allowing sufficient blowing time (three minutes), consistent and repeatable separation can be expected.

The UBP removes mainly light-weight inert matter consisting of empty florets or florets with insufficiently developed caryopses, which cannot produce normal seedlings. In contrast, the seeds that remain in the heavy fraction are well developed and can produce normal seedlings (Fig. 3). No blowing procedure is perfect and absolute; thus, even at the best blowing point, some borderline-quality seed units may be blown

out along with the empty florets. However, such borderline seed units are infrequent, and the seedlings developed from them are weak or abnormal.

How to find the optimum blowing point for a species

Samples that contain empty florets should be used to conduct the study to identify the optimum blowing point for a species. Depending on the species in question, one or more of the following methods can be used to find the optimum blowing point. If several blowers are available, choose a reliable blower (reference blower) to carry out the study. The assessment of blowing material can be carried out in one of two ways: (1) a visual assessment of the lightweight material removed by blowing, by searching for caryopses within florets, or (2) an assessment of the germination response of the lightweight material removed by blowing (Fig. 2).

Finding the optimum blowing point by visual assessment of florets (seeds)

The current pure seed and inert matter definitions in the Rules should be used as a standard for separation of lightweight inert matter. A diaphanoscope or similar source of light should be used to visually verify the presence and size of caryopses. If the pure seed definition for the species in question is not available in the Rules, a preliminary study to establish a definition is necessary (e.g. caryopsis size relative to the size of the seed unit).

Obviously, the visual separation method can be used only when it is possible to visually verify the presence and size of the caryopsis inside the seed unit. When the presence or size of the caryopsis cannot be determined visually (because the surrounding structures obscure the view), or by applying pressure to determine if a caryopsis is present, the seed unit may have to be cut, or x-ray images used, to evaluate the presence or size of the caryopsis. If none of the above methods are available, finding the

Figure 1. According to the AOSA and ISTA rules, pure seed units of tall fescue include florets containing a caryopsis extending at least one-third the length of the palea when measured from the base of the rachilla.

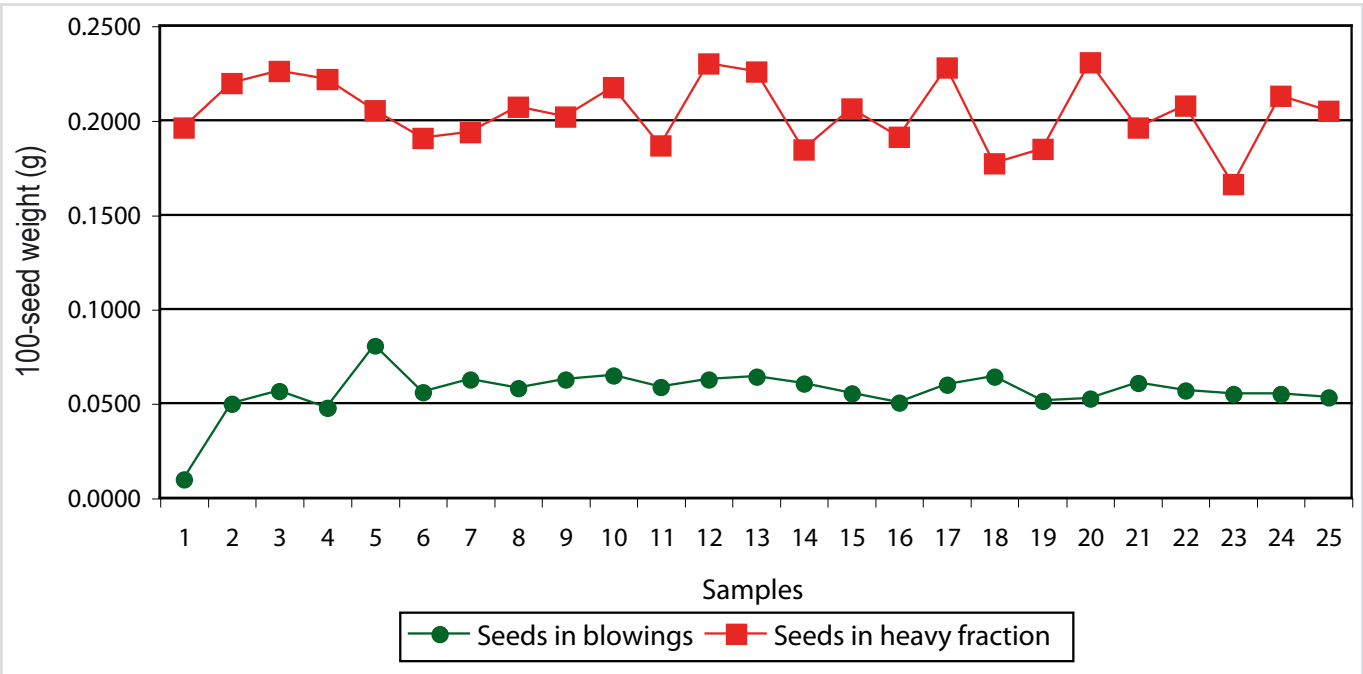


Figure 2. Comparison of 100-seed weights of florets separated by an optimum blowing point in 25 samples of tall fescue.

optimum blowing point by germinating the seeds is recommended, as described below.

To find the optimum blowing point, the sample is blown, starting at a lower air velocity and gradually increasing the speed of air (i.e. opening the air-gate). All material blown into the collection pan at each air-gate opening is removed for examination. The number of florets lacking caryopses (empty) and pure seed units from each blower setting are counted and plotted (Fig. 4). The intersection of the pure seed and inert matter (empty florets) identifies the optimum blowing point. In the tall fescue example, a blowing point in the reference blower used to achieve a 2.9 m/s air velocity lifted empty structures and a minimum number of marginally developed light seed units. The same blowing point also retained the heavy portion, which contained pure seed units and a negligible number of underdeveloped seeds. It should also be noted that the point of optimum air velocity was nearly identical for all three blind samples used in the study (see Fig. 4).

Finding the optimum blowing point by germinating the seeds

If visual assessment is difficult, impractical or impossible, the optimum blowing point can be identified simply by using standard germination tests. This works best when the seed is not dormant or if dormancy can be broken effectively before starting the study. In the case of tall fescue, germination tests were conducted to verify whether the optimum blowing point found by the visual evaluation was correct. Whenever possible, both the visual assessment of seed units and germination of the seed units should be used to find the optimum blowing point. Figure 5 shows the germination percentage of seeds (from the same sample) that were blown out using several air velocity settings ranging from 2.3 to 4.3 m/s. A sample from the remaining seeds of the heaviest fraction that could not be lifted even at 4.3 m/s was planted as a check control. It should be noted that most of the seed-like structures in the light fraction (up to air velocity 3.2 m/s) showed very low germination. The germination study indicated that a blowing point between 2.9 m/s and 3.2 m/s would be suitable for separating light inert materials from pure seed in tall fescue.

Obviously, a UBP based on three samples is not enough to make a decision for a whole species. To further validate the suitability of a suggested blowing point, a broader range of samples need to be subjected to the suggested blowing point to determine its validity. In tall fescue, over 20 different varieties from several years

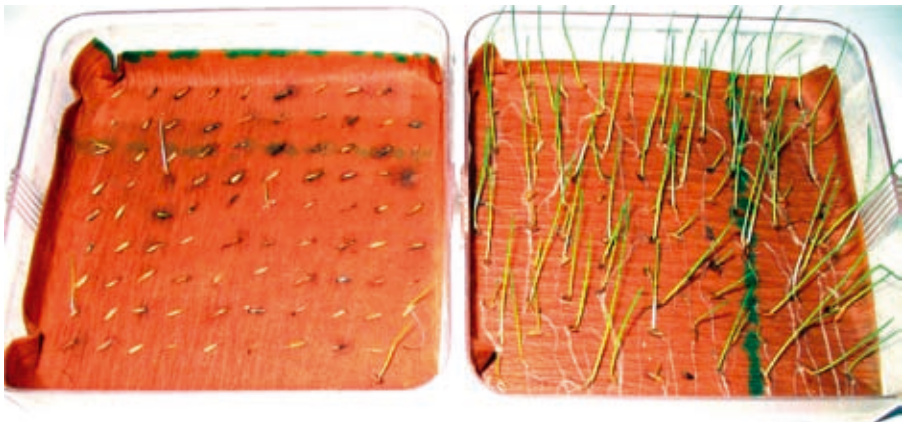


Figure 3. The empty and under-developed seed units in the light fraction (left) do not have planting value, whereas the well-developed seeds found in the heavy fraction (right) produce normal seedlings in a standard germination test.

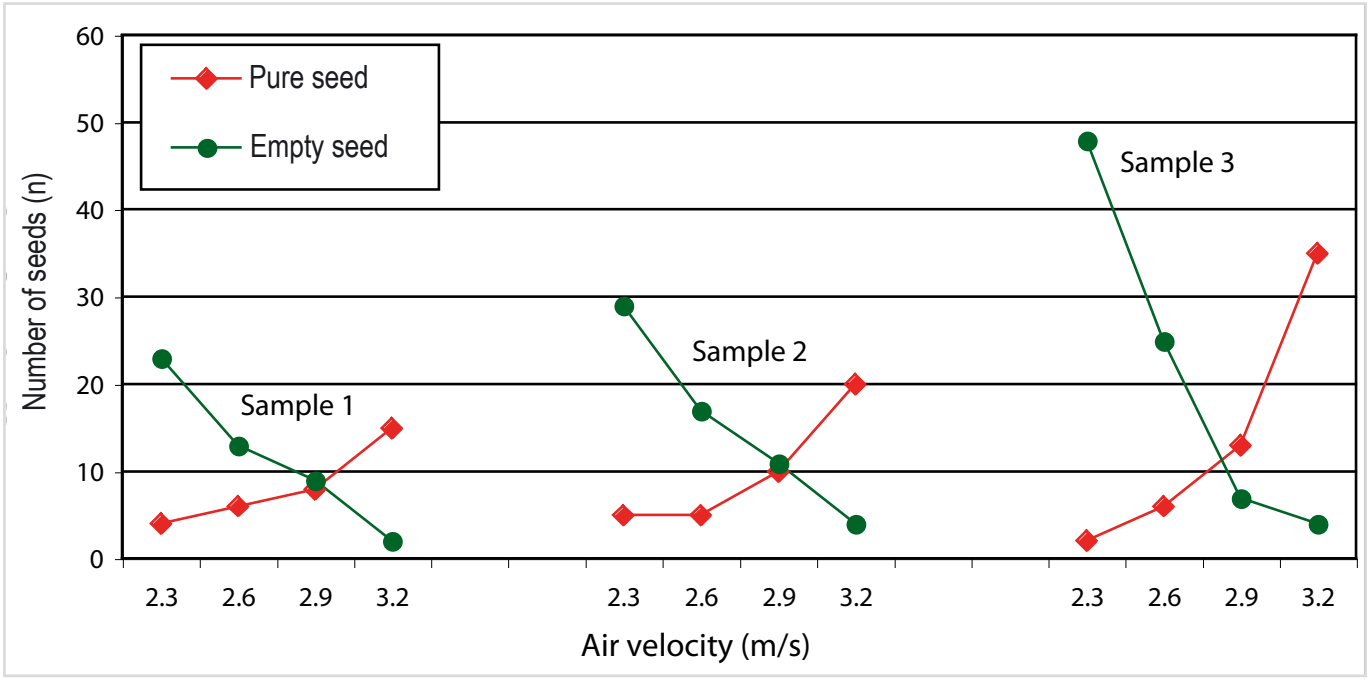


Figure 4. The number of empty seed units used to find the optimum blowing point in three samples of tall fescue, of varying quality, using the crossover point principle based on visual assessment of the florets.

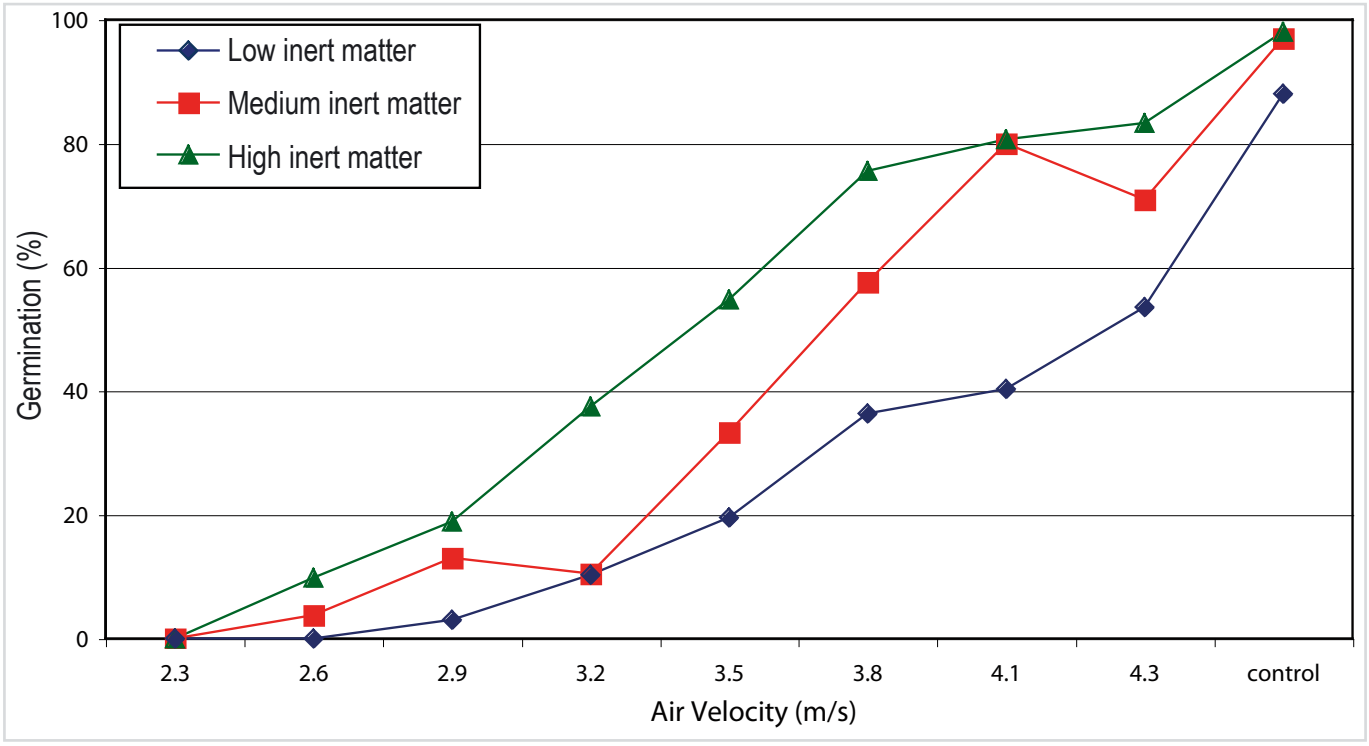


Figure 5. Germination of seeds removed by blowing procedure at each air velocity from 2.3 to 4.3 m/s in three tall fescue samples. The heaviest seeds (remained after blowing at 4.3 m/s) included as a control.

Figure 6. A set of tall fescue master calibration samples where green florets represent empty seeds and red represent pure seeds. Every individual sample in the set has the capacity to find the same optimum blowing point.

representing various growing conditions and cleaning levels were tested.

The samples included in the tall fescue study ranged from very small to the largest-seeded varieties. The data showed that variation due to any of the above factors had a minimal effect on the precision of separating light inert matter from heavy pure seed. Based on the data collected from various studies, an air velocity of 3.0 m/s in the reference blower was defined as the optimum blowing point for tall fescue.

Application of a new uniform blowing procedure across laboratories

Application of a new UBP across laboratories begins with the development of an MCS, establishing a central curator (administrative laboratory) for the MCS, distribution of the MCS to all laboratories to calibrate individual blowers, determination of the EAV for each blower, and validation of the new UBP prior to inclusion in the ISTA Rules.

The first step is to prepare master calibration samples that can be used to transfer the optimum blowing point found in a reference blower to blowers in other laboratories. Such calibration samples have to be produced and used to find the optimum blowing point (i.e., the correct air-gate opening and EAV) in other blowers as in Kentucky bluegrass and orchardgrass (AOSA Rules 2008). Using these principles, a set of MCS of proven uniformity was produced at Oregon State University Seed Laboratory for tall fescue (Fig. 6).

These MCS have to be produced following several important criteria: (1) they should be capable of finding the optimum blowing point for separating lightweight inert matter, including empty and underdeveloped seeds, from pure seeds; (2) every

Figure 7. Master calibration samples are used to find the correct air-gate opening to provide the optimum blowing point to achieve separation of empty (green) and pure (red) florets.

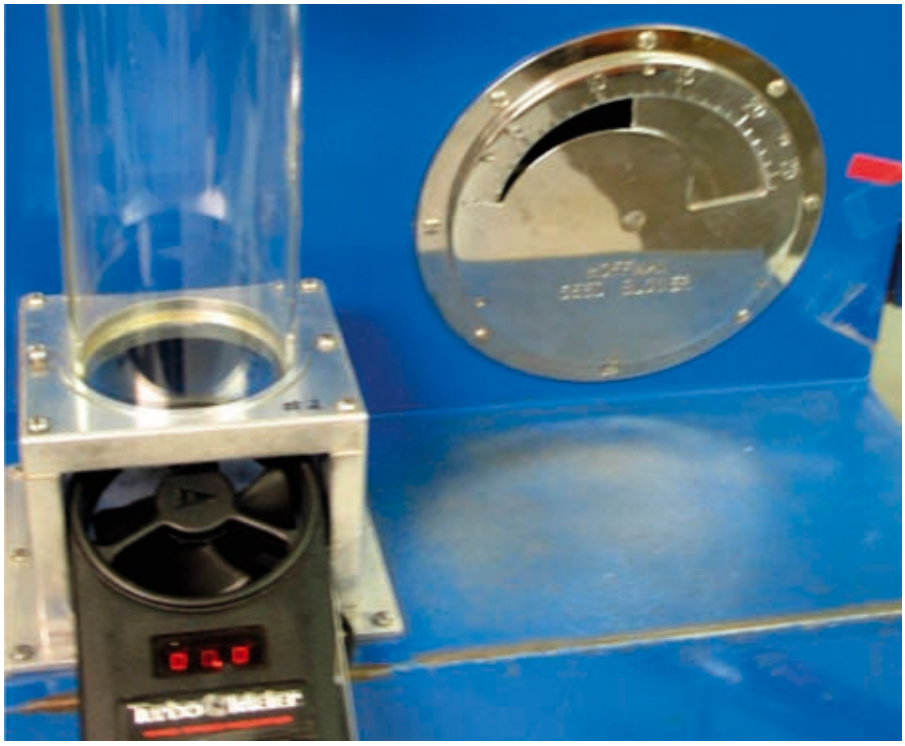


Figure 8. After the correct air-gate opening is determined, the equivalent air velocity is measured in meters per second using a rotary fan anemometer that fits over the opening in the blower normally occupied by the seed cup in the General-type blower.

sample in the set should have the capacity to find the same blowing point; and (3) these capacities should be maintained through time. These conditions are critical for assuring uniformity for all users over time.

The second step is to make the MCS available to interested laboratories for blower calibration. A central curator should manage and maintain the identity and integrity of the calibration samples. The model used by the AOSA may be useful: the MCS is maintained by the USDA Seed Laboratory (Gastonia, North Carolina), and the AOSA and SCST member laboratories simply borrow a MCS, use it to find the optimum blowing point in their blower, and return it to the USDA Seed Laboratory, which verifies the integrity of the MCS upon arrival. This process assures the availability of uniform MCS to laboratories at minimal cost, eliminating the need for each lab to purchase calibration samples. In addition, the process assures the integrity and uniformity of the MCS used by all laboratories, thus reducing variability in test results between laboratories caused by deteriorated or damaged calibration samples.

The third step is the calibration process of each blower in each laboratory. The optimum blowing point is achieved when the air-gate opening of a general blower consistently separates the green florets, representing empty florets, and the red florets, representing pure seeds (Fig. 7). For specific instructions on the calibration procedure of blowers, see the AOSA Uniform Blowing Procedure: Handbook No. 24 (AOSA, 2006). It should be noted that this portion of the process is similar to the current ISTA blower calibration procedure; however, to insure uniformity in test results across laboratories, an MCS of proven uniformity is required.

It is not practical to use a calibration sample repeatedly to find the correct air-gate opening in a blower. The repeated use of a calibration sample contributes to its deterioration over time and consequently to variation in the calibration sample itself. Additionally, relying upon the air-gate setting to identify the blowing point indefinitely is not recommended, because the gear controlling the gate opening can be worn over time. Thus, the use of the EAV for daily operations for setting the blower was devised (Fig. 8).

The fourth step in applying a new blowing procedure is to establish the EAV for each calibrated blower. This consists of measuring the air velocity using an anemometer immediately after the correct air-gate opening is identified by using the master calibration sample. The advantages of this system are as follows:

a) Once established, using the EAV to verify blower calibration eliminates the need to repeatedly use biologically based calibration samples.
b) The EAV value becomes a fixed point for each individual blower. As long as the blower is set based on its same EAV value, the separation of inert matter and pure seed will be consistent for the species being tested. This condition is important for repeatability in every blower over time.
c) Since the measurement of air velocity is simple, it is possible to verify the correct setting of the blower every day or before blowing a group of samples. This prevents any undesirable variation. It is also useful for keeping daily records of verification of blower calibration.

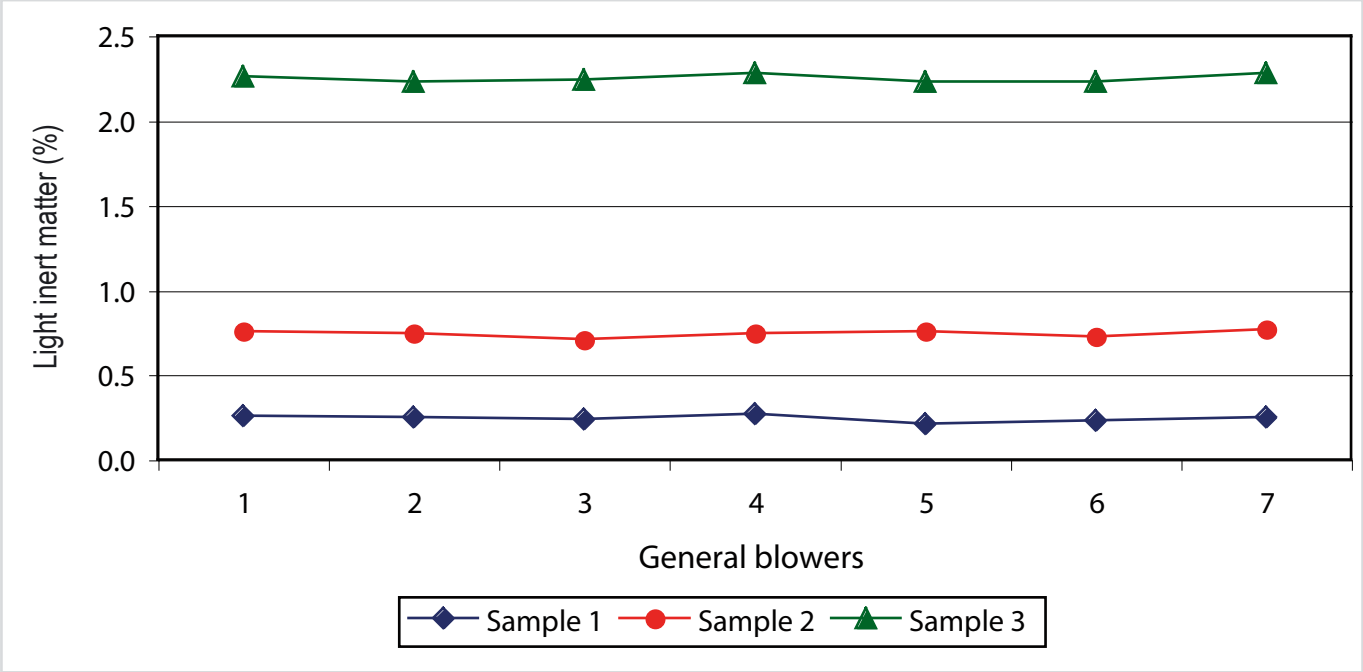


Figure 9. Consistency of lightweight inert matter separation in three tall fescue samples separated by seven calibrated general blower at OSU Seed Laboratory.

d) Using the EAV technique makes the UBP simple, quick, and user-friendly. It takes less than 3 minutes to check whether the blower is set to the correct EAV, then one can blow any number of samples of that species during the day. It is worth noting that the MCS and the associated EAV will be different for each species tested. Therefore, if more than one species is to be tested using the UBP, the blower must be set based on the EAV for the first species to be tested, and then re-set based on the EAV for the next species.
e) Temperature, variation of relative humidity and moving a blower inside a building have a minimal effect on the air velocity measurements, especially under low air velocity such as 3 m/s.

If a major repair to the blower is necessary, such as change of glass tube or motor, the blower must be re-calibrated with the MCS to establish the new EAV for the blower. This process is necessary for each species requiring the UBP.

Once a new UBP is proposed, the final step should be method validated prior to adoption as an official method. In the case of tall fescue, a study was conducted at Oregon State University Seed Laboratory to test the uniformity of separating light inert matter across blowers. The seven calibrated blowers separated the light inert material consistently from all samples (Fig. 9). Obviously, in a real-life situation, when different submitted or working samples are drawn from the same seed lot, random sampling variation of inert material would be expected, which contributes to variation in test results among subsamples and labs. Such variation is in most cases not significant, and has nothing to do with the UBP. This kind of variation is unavoidable and is expected in any test.

Finally, after verifying that the UBP is working properly, a referee study is recommended to measure the repeatability of the new method among laboratories. In the case of tall fescue, several in-house studies were conducted at OSU seed laboratory in a broad range of samples from different varieties, years and environments to evaluate the UBP. The results were consistent across the various samples included in the studies. In addition, a national referee was conducted in 2006 with 16 laboratories to compare the UBP with the AOSA visual/manual method. The results showed that the new method produced comparable results (within tolerance) to the current AOSA method. The in-house and national validation studies demonstrated that the UBP is reliable in separating the lightweight inert matter from tall fescue samples. Similar validations are necessary when developing UBP for any new species.

Benefits of using the uniform blowing procedure

The following are the immediate benefits of using the revised uniform blowing procedure in seed testing laboratories:

Simplicity

Once the optimum blowing point is identified using a MCS, and the subsequent EAV is recorded, the daily operation of blowing test samples becomes simple, quick and user friendly. The correct air velocity setting can be checked with an anemometer every day or even more frequently if needed, and then the analyst simply blows each working sample for three minutes. The light fraction will contain seed units of no planting value and other lightweight inert matter and the heavy fraction will contain pure seeds. This separation occurs regardless of the amount of the light materials present in each sample (Fig. 10). Once that operation is completed, the analyst simply needs to search for other inert matter (e.g. stems, soil etc.) in the heavy fraction, and seeds of other species must be removed from both the light and heavy fractions to complete the purity analysis.

Figure 10. Three samples of tall fescue blown at the same EAV value. Small vials contain the light fraction (blowings), and large vials contain the heavy fraction (pure seed). Separation occurs regardless of the amount of the light materials present in each sample.

Uniformity

The UBP is a mechanized operation. As such, it eliminates century-old problems such as analyst subjectivity and fatigue. Furthermore, the MCS makes it possible for all laboratories, regardless of their location in the world, to set their blowers at a comparable point that separates similar types of structures consistently. This uniformity in blower calibration across labs and through time contributes to repeatability within and among laboratories.

Efficiency

The business of seed testing is no different than any other service-oriented business; it needs to be efficient, in order to reduce the cost of operations and to deliver results in the shortest time possible. The UBP contributes towards these goals. A national referee was conducted to measure the time saving using the UBP for tall fescue. Several laboratories in the USA and Canada participated in the study. The results showed that inert matter separated from tall fescue samples using a UBP was completed in an average of 10 minutes, compared to 43 minutes using the current AOSA visual-manual separation method. The observations in time saving in other species in which the UBP is used, e.g. Kentucky bluegrass and orchardgrass, are consistent with these results.

In the end, uniformity and timeliness in delivering test results has direct and indirect benefits for seed growers, cleaners, traders and end users. Repeatability of results between producing and consuming states and countries would increase if the removal of inert matter were to be mechanized using the blowing procedure. Timeliness in delivering results to meet market deadlines would improve. As more grass seeds are commercialized across states and countries around the world, both repeatability and timeliness will become more and more important.

Final remarks

This article was prepared in the hope of reaching those who are working with grass seeds but who may not be familiar with the UBP using MCS of proven uniformity and EAV values. The authors hope that a greater understanding of the principles and the operational steps will motivate researchers and laboratories to initiate the development of similar procedures for other species.

It is currently not possible to visualize a complete mechanization of inert matter separation in grass seeds. However, it is possible to envision the day when uniform mechanized separation of lightweight inert materials is possible in most commercially important grass seeds around the world.

This procedure is still new to many potential users. It is also new to many seed industry members. This means that the seed testing laboratories that already use these procedures, and those that are leading the development of such procedures, need to share their experiences with other laboratories and the broader seed industry community.

Finally, there is a question whether the blowing procedure can be developed for species other than grasses; obviously this will need to be researched one species at the time. In principle, as long as there is a difference in the terminal velocity between the undesirable and desirable particles in a sample, and as long as the blower is capable of producing a sufficient air velocity to perform the specific separation, it should be possible to develop effective blowing procedures for many species.

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Method validation in the early days – testing forest tree seeds in 1928–1934

Prof. Dr. Dr. h.c. A.M. Steiner[1], Prof. Dr. M. Kruse[2] and Prof. Dr. N. Leist[3]
[1]ISTA Alumnus, [2]ISTA Personal Member and [3]ISTA past President and Honorary Life Member

University of Hohenheim and LTZ Augustenberg
Karlsruhe, Germany
steiner@pz.uni-hohenheim.de
mkruse@uni-hohenheim.de
norbert.leist@botanik1.uni-karlsruhe.de

Since Nobbe founded seed testing in 1869 (Steiner and Kruse, 2007), seed testing and method validation – formerly called method standardization – have gone hand in hand. There was a stepwise development of validation procedures. At the end of the 19th century, a procedure was established that was in principle not different from today:

1. submission of test proposal;
2. formation of working group;
3. formulation of test plan;
4. description of methods;
5. selection of samples;
6. distribution of samples and reporting sheets;
7. reporting of results;
8. statistical analysis;
9. documentation;
10. evaluation and discussion of results;
11. consideration of relevance for incorporation into Rules (Steiner, Kruse and Leist, 2008).

This procedure was used worldwide in a responsible, flexible and efficient way (Steiner and Kruse 2006). In 1924, ISTA adopted this procedure, although it was not formally recorded (Steiner 1997, 1998; cf. Schuon and Don 2008). In order to show that ISTA followed this procedure from the beginning, two case studies of testing forest tree seeds in the working periods 1928–31 and1931–34 are presented.

Working period 1928–1931

At the Rome Congress in 1928, a Committee on Examinations of Forest Seeds (CFS) was set up (Dorph-Petersen, 1928). The Chairman was G. Lakon, Hohenheim, and the members A. Grisch, Zurich-Oerlikon, I. Gadd, Stockholm-Stocksund, A. Beck and K. Dorph-Petersen, Copenhagen, J.E. Aalto-Setälä, Helsinki, and from 1931 also G. Wieringa, Wageningen, and G. Vincent, Brno (Anonymous, 1931).

By coincidence, at that time Lakon was also Member of the Research Committee for Countries with Temperate Climate, which prepared the first ISTA Rules in 1931, and also Member of the Provenance Committee.

To achieve standardization, the first ISTA study of forest seeds organized by the CFS was performed in 1930 on *Picea excelsa* syn. *Picea abies*, *Pinus sylvestris*, *Larix europaea* and *Pinus strobus*. The study determined 1000-seed weight, purity, germination (including day of final count), and utility value.

After in-house testing, Lakon selected five lots of the first four species mentioned, and two of *Pinus strobus*, and sent them along with detailed reporting sheets to the four CFS members. Testing was done using the individual laboratory methods of the participants.

Lakon received back the results, added the averages and had everything printed for circulation (Fig. 1). He analysed the results statistically by testing compatibility with tolerances, and studied whether deviations were random or systematic.

All results, together with Lakon's detailed evaluation and comments, are documented in the CFS Report presented at the Wageningen Congress (Lakon, 1931).

In general, there was random variation in the 1000-seed weight, a systematic error in purity, and random variation in germination and the utility values. Most of the results were within tolerance, but a few were not, in particular in purity analysis. In germination testing, there were difficulties in the determination of abnormal seedlings and fresh seeds.

In the discussion, Dorph-Petersen pointed to the sensitivity of the seeds towards pressure, Doyer mentioned possible difficulties due to larvae, and Lakon regretted not having been able to arrange a pre-Congress CFS meeting owing to a lack of funds.

Finally, the CFS came to the conclusion that experimental error should best be minimized in order to detect systematic deviations more precisely. Therefore, it was decided to run the next study using several samples of *Picea excelsa* only.

Working period 1931–1934

For the second test, the members of the CFS, now totalling seven, were joined by their well-known ISTA colleague E. Brown (Fig. 2), who had been a member of the organizing committee for the 1st International Conference on Seed Testing in 1906 (Steiner and Kruse, 2006).

Lakon distributed samples from six lots of *Picea excelsa,* for determining the same traits as in the previous year. As regards methodology, the general principles shown in the ISTA Rules of 1931 were to be applied.

The first task was to recheck the mass of two samples of exactly 10 g prepared at Hohenheim. Surprisingly, two participants reported higher values in all samples. Later in his report, Lakon assumed shortcomings in weighing.

Determinations of purity showed less variation in a sample set prepared and distributed by Hohenheim than in sample sets prepared individually by the participating laboratories.

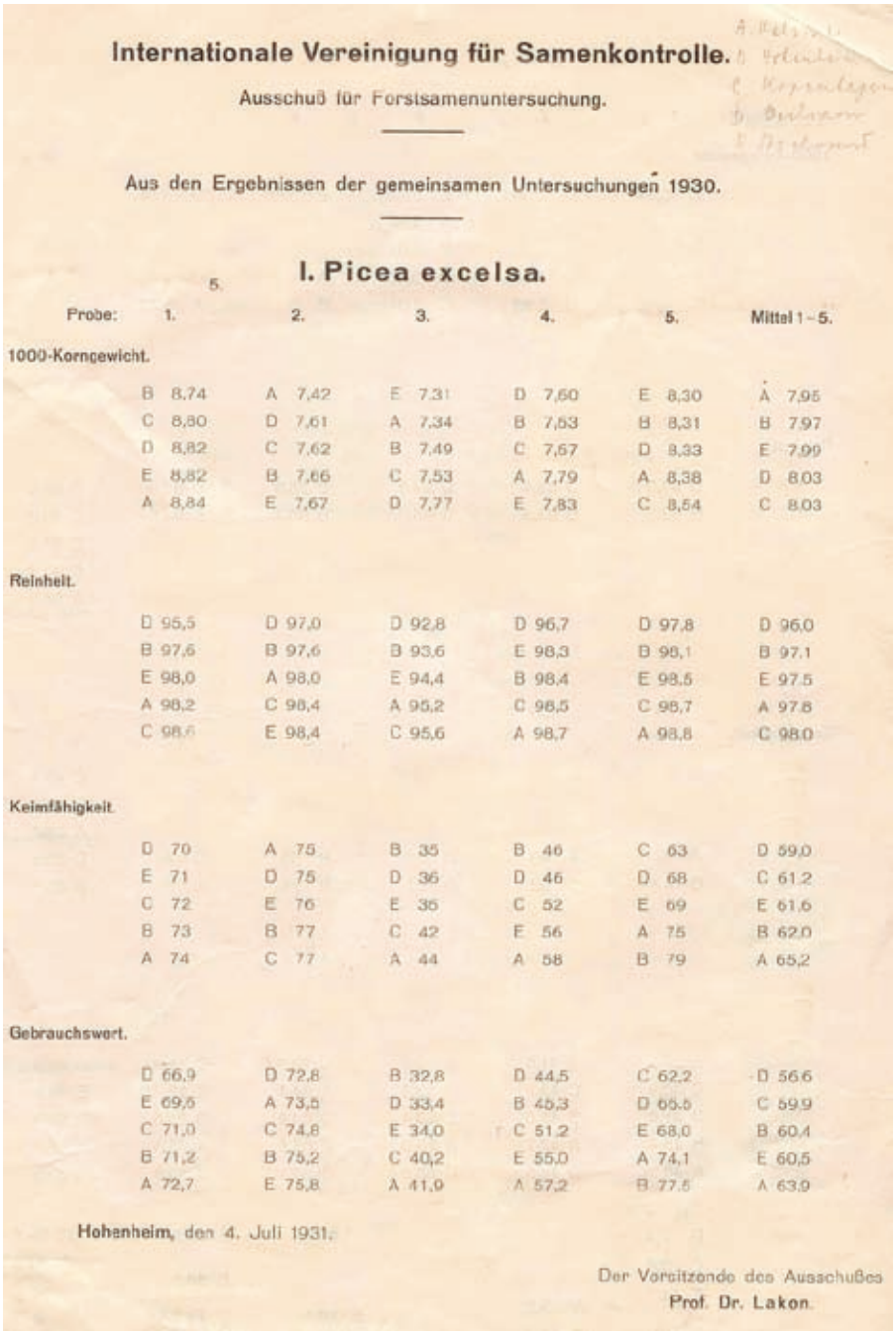
Germination percentages exceeded the tolerances, and in addition, systematic deviations were observed. However, at this point it must be mentioned that in those days, tolerances were defined for a comparison between two results, but not for three or more. Hence, applying the effective tolerances to a set of eight results was too strict. In some cases, the germination rate measured at days 7 and 14 differed greatly. However, it levelled out after 21 days, with 28 days being appropriate for the final count.

In a few cases, there were outliers in the percentages of fresh, empty and infected seeds, while the percentage of abnormal seedlings was uniformly close to zero. As

before, the utility value corresponded with germination.

An example of a reporting sheet is shown in Figure 3, and the signatures of the participants, all highly experienced and distinguished seed testing pioneers, are shown in Figure 4. The documents are from the archives of the Division of Seed Science and Technology of the University of Hohenheim. All results, and Lakon's detailed evaluation and comments, were reported at the Stockholm Congress (Lakon, 1934). The CFS concluded that standardization was not yet satisfactory, and further exchange of samples between laboratories was recommended.

In the discussion of the report, a dispute arose about Lakon's assumption of inaccurate weighing, in spite of the fact that he had not disclosed the identity of the two systematically deviating laboratories. Franck of Wageningen, disclosing that his laboratory was one of the two, affirmed that their balances were regularly calibrated, and that weighing was done independently by at least two analysts, using different balances. Taking into account the humid Dutch climate in April and May, he decided to trace back the systematic higher mass of the submitted samples to water uptake in the relatively cold rooms where the balances were located, and the systematic lower mass of the sum of the purity components compared with the previous total mass to loss of water in the centrally heated dry working rooms where the purity analyses were done. Grisch settled the dispute, and Doyer recommended studying the sources of error. Gadd suggested, in cases of doubt, to contact the laboratory concerned before finalizing the Report. Van Rijn ended the discussion, and ISTA President Dorph-Petersen seconded Gadd, at the same time endorsing his high appreciation for Lakon's commendable work as Chairman. He concluded that changes in mass due to water uptake, or loss due to exposure of samples to varying humidity, should be studied.



Internationale Vereinigung für Samenkontrolle.

Ausschuß für Forstsamenuntersuchung.

Aus den Ergebnissen der gemeinsamen Untersuchungen 1930.

I. Picea excelsa.

Probe:	1.	2.	3.	4.	5.	Mittel 1–5.
1000-Korngewicht.						
	B 8,74	A 7,42	E 7,31	D 7,60	E 8,30	A 7,95
	C 8,80	D 7,61	A 7,34	B 7,53	B 8,31	B 7,97
	D 8,82	C 7,62	B 7,49	C 7,57	D 8,33	E 7,99
	E 8,82	B 7,66	C 7,53	A 7,79	A 8,38	D 8,03
	A 8,84	E 7,67	D 7,77	E 7,83	C 8,54	C 8,03
Reinheit.						
	D 95,5	D 97,0	D 92,8	D 96,7	D 97,8	D 96,0
	B 97,6	B 97,6	B 93,6	E 98,3	B 98,1	B 97,1
	E 98,0	A 98,0	E 94,4	B 98,4	E 98,5	E 97,5
	A 98,2	C 98,4	A 95,2	C 98,5	C 98,7	A 97,8
	C 98,6	E 98,4	C 95,6	A 98,7	A 98,8	C 98,0
Keimfähigkeit.						
	D 70	A 75	B 35	B 46	C 63	D 59,0
	E 71	D 75	D 36	D 46	D 68	C 61,2
	C 72	E 76	E 36	C 52	E 69	E 61,6
	B 73	B 77	C 42	E 56	A 75	B 62,0
	A 74	C 77	A 44	A 58	B 79	A 65,2
Gebrauchswert.						
	D 66,9	D 72,8	B 32,8	D 44,5	C 62,2	D 56,6
	E 69,5	A 73,5	D 33,4	B 45,3	D 65,5	C 59,9
	C 71,0	C 74,8	E 34,0	C 51,2	E 68,0	B 60,4
	B 71,2	B 75,2	C 40,2	E 55,0	A 74,1	E 60,5
	A 72,7	E 75,8	A 41,9	A 57,2	B 77,5	A 63,9

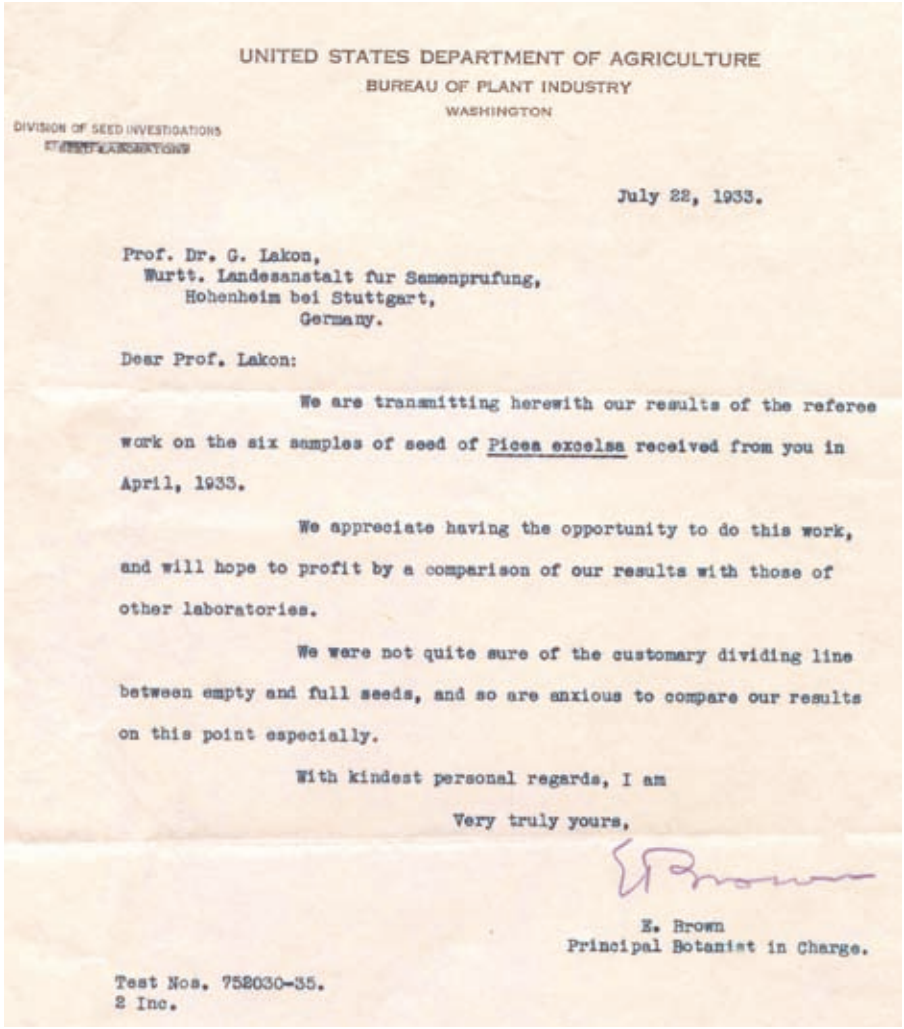
Hohenheim, den 4. Juli 1931.

Der Vorsitzende des Ausschußes
Prof. Dr. Lakon.

Figure 1. First page of the printed results of the study of 1931. The handwritten insert by Lakon at the top right corner allocates the letters to the participating laboratories. The document is in German, which was the prevailing language in seed testing and likewise in ISTA from Nobbe's time until World War II; see also Figure 3.

Continuation of work 1934–1950

During the working period 1934–1937, Lakon prepared samples of six lots of *Picea abies* for 12 participants for studying the same quality traits as before. All 72 samples were first tested in Hohenheim, then one sample of each lot was tested by the participants, and finally all 72 samples were tested in Zurich. As reported at the Zurich Congress (Lakon, 1938), this resulted in deeper insights into the causes of variation. Particularly the not yet harmonized use of the stronger method and quicker method of purity testing caused problems. However, in spite of the advanced state of standardization, the CFS wisely refrained from proposing testing prescriptions for incorporation into the updated second ISTA Rules of 1938.



UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF PLANT INDUSTRY
WASHINGTON

DIVISION OF SEED INVESTIGATIONS

July 22, 1933.

Prof. Dr. G. Lakon,
Wurtt. Landesanstalt fur Samenprufung,
Hohenheim bei Stuttgart,
Germany.

Dear Prof. Lakon:

We are transmitting herewith our results of the referee work on the six samples of seed of Picea excelsa received from you in April, 1933.

We appreciate having the opportunity to do this work, and will hope to profit by a comparison of our results with those of other laboratories.

We were not quite sure of the customary dividing line between empty and full seeds, and so are anxious to compare our results on this point especially.

With kindest personal regards, I am

Very truly yours,

E. Brown
Principal Botanist in Charge.

Test Nos. 752030-35.
2 Inc.

Figure 2. Example of a cover letter as returned with the reporting sheet.

World War II and the postwar period did nothing to disrupt work. The inspiring spirit of the ISTA family and the CFS overcame this obstruction productively. In his report at the Washington Congress, Lakon (1950) presented testing methods for 17 genera and 17 species of woody plants, both forest and ornamental. This proposal was based on both 40 years of personal experience (Lakon had started tree seed testing at Tharandt in 1910 in the tradition of Nobbe) and the long cooperation with colleagues (e.g. Lakon and Grisch, 1923) and exchange of experience within the CFS by correspondence and visits. Incidentally, in 14 of these methods he already recommended tetrazolium viability testing. Owing to Lakon's impending retirement at that time, G.A. Elliott of Ottawa was elected chairman of the CFS, reporting to the Dublin Congress (Elliott, 1953). Eventually, for the first time methods for testing woody plant seeds were incorporated into the updated third ISTA Rules 1954. From the list proposed by Lakon in 1950, 28 genera or species were included, 5 ornamental species were not, and five North American forest species were added.

Conclusions

The method validation procedure for seed testing was established at the end of the 19th century (Steiner, Kruse and Leist, 2008). The two case studies act as examples to show that, following this validation procedure, ISTA observed a goal-oriented, flexible and responsible approach in validating seed testing methods (Steiner, 1997, 1998). Generally, the reports of the ISTA Committees presented at the ISTA Congresses contain the documentation and discussion of the validation studies. In addition, many supporting original publications were published in the Congress Volumes and the Proceedings of ISTA, as well as in other journals. A review of the activities of the Plant Disease Committee from 1924 to 1999 was provided by Mathur and Jørgensen (2002), a progress report on the testing of germination from 1924 to 1999 by Klitgård (2002), and a review of the development of purity analysis and determination of other seeds by number from 1924 to 2006 by Jensen (2008). Thus, from the beginning the ISTA Rules were based on the expert knowledge and loyal and faithful work of generations of seed scientists in all conscience striving for advancement in seed testing, even long before ISTA's inception and later on during ISTA's development. Recently, method validation was formalized and elaborately set out in writing (ISTA Document 2007, cf. Hampton, 2009).

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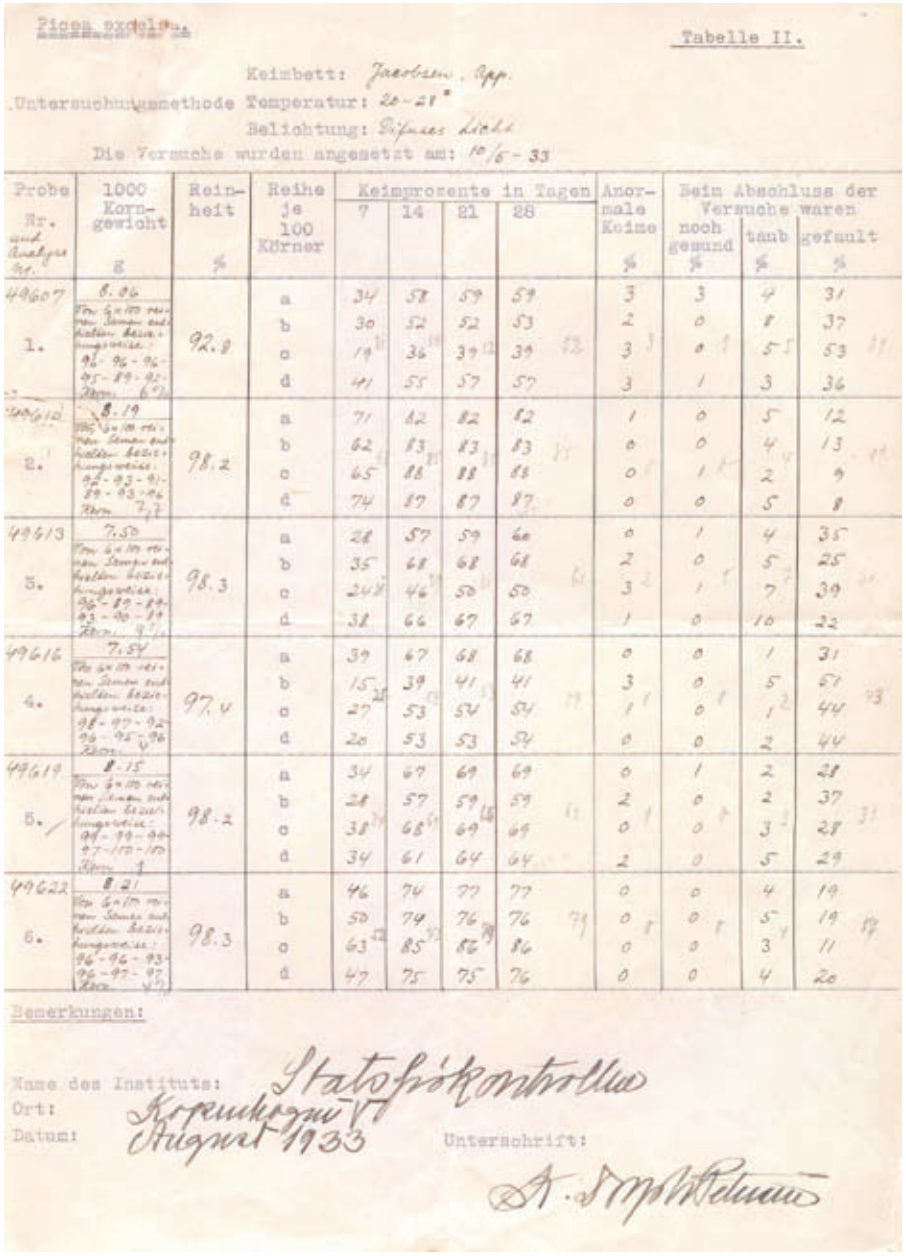

Tabelle II.

Keimbett: Jacobsen, Opp.
Untersuchungsmethode Temperatur: 20-21°
Belichtung: Diffuses Licht
Die Versuche wurden angesetzt am: 10/6-33

Probe Nr. und Analyse Nr.	1000 Korngewicht g	Reinheit %	Reihe je 100 Körner	Keimprozente in Tagen 7	14	21	28	Anormale Keime %	Beim Abschluss der Versuche waren noch gequollen %	taub %	gefault %
49607 1.	8.86	92.8	a	34	58	59	59	3	3	4	31
			b	30	52	52	53	2	0	8	37
			c	19	36	39	39	3	0	5	53
			d	41	55	57	57	3	1	3	36
49612 2.	8.19	98.2	a	71	82	82	82	1	0	5	12
			b	62	83	83	83	0	0	4	13
			c	65	88	88	88	0	1	2	9
			d	74	87	87	87	0	0	5	8
49613 3.	7.58	98.3	a	28	57	59	60	0	1	4	35
			b	35	68	68	68	2	0	5	25
			c	24	46	50	50	3	1	7	39
			d	38	66	67	67	1	0	10	22
49616 4.	7.54	97.4	a	39	67	68	68	0	0	1	31
			b	15	39	41	41	3	0	5	51
			c	27	53	54	54	1	0	1	44
			d	20	53	53	54	0	0	2	44
49619 5.	8.15	98.2	a	34	67	69	69	0	1	2	28
			b	28	57	59	59	2	0	2	37
			c	38	68	69	69	0	0	3	28
			d	34	61	64	64	2	0	5	29
49622 6.	8.21	98.3	a	46	74	77	77	0	0	4	19
			b	50	74	76	76	0	0	5	19
			c	63	85	86	86	0	0	3	11
			d	47	75	75	76	0	0	4	20

Bemerkungen:

Name des Institutes: Statsfrökontrollen
Ort: Kopenhagen V
Datum: August 1933
Unterschrift:

Figure 3. Example of a completed reporting sheet. The means were calculated and inserted by Lakon.

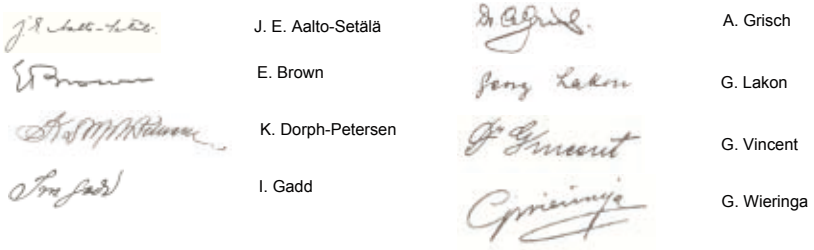

Figure 4. Signatures of the participants in the 1933 validation study as copied from the reporting sheets.

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Laboratory accreditation changes

Status 1 September 2009

Re-accreditations

Belgium BEDL02

Laboratorium voor Zaadontleding
Burgemeester van Gansberghelaan 109
9820 Merelbeke
Phone: + 32 9 272 23 22
Fax: +32 9 272 23 21
E-mail: anja.ritserveldt@lv.vlaanderen.be

Switzerland CHDL01

Forschungsanstalt Agroscope Reckenholz-Tänikon ART – Saatgutprüfung
Reckenholzstrasse 191
8046 Zürich
Phone: +41 44 3777111
Fax: +41 44 3777201
E-mail: silvia.zanetti@art.admin.ch

Czech Republic CZDL03

Central Institute for Supervising and Testing in Agriculture – Department of Seed Testing
Za opravnou 4
150 06 Praha 5 - Motol
Phone: +420 2 57211751
Fax: +420 257211748
E-mail: barbora.dobiasova@ukzuz.cz

Germany DEDL04

Landwirtschaftliches Technologiezentrum Augustenberg (LTZ) – Referat 23 Saatgutuntersuchung und Angewandte Botanik
Nesslerstrasse 23-31
76227 Karlsruhe
Phone: +49 721 9468150
Fax: +49 7219468387
E-mail: andrea.jonitz@ltz.bwl.de

Italy ITML06

Centro Nazionale per lo studio e la Conservazione della Biodiversita Forestale
Via del Ponte 256
37020 Peri, Verona
Phone: +39 45 628 4071
Fax: +39 45 628 4089
E-mail: f.gorian@corpoforestale.it

Japan JPDL03

National Livestock Breeding Center
Nagano Station
2029-1 Arakoda, Saku, Nagano 385-0007
Phone: +81 267 672501
Fax: +81 267 684743
E-mail: y0tsuji@nlbc.go.jp

Kenya KEDL01

KEPHIS Seed Testing Laboratory
P.O. Box 1679, 20100 Nakuru
Phone: + 254 20 3536170
Fax: +254 20 3536170
E-mail: kephissq@africaonline.co.ke

Latvia LVDL01

National Seed Testing Laboratory
Lielvardes str. 36/38, 1006 Riga
Phone: +371 711 2716
Fax: +371 711 3085
E-mail: velta.evelone@vaad.gov.lv

Netherlands NLML05

Innoseeds BV
P.O. Box 1, 4420 Kapelle
Phone: +31 113 347911
Fax: +31 113 342778
E-mail: Harry.Nijenstein@innoseeds.nl

New Zealand NZDL01

AsureQuality Limited,
Palmerston North Seed Laboratory
Batchelar Agriculture Centre
Tennent Drive
P.O. Box 609, Palmerston North
Phone: +64 6 351 7946
Fax: +64 6 351 7907
E-mail: belldd@asurequality.com

NZDL02

Institute of Natural Resources
Massey University
P.O. Box 11 222, Tennent Drive
4442 Palmerston North
Phone: +64 6 3505799
Fax: +64 6 3505649
E-mail: C.R.McGill@massey.ac.nz

NZML03

New Zealand Seedlab
60 Ryans Road, P.O. Box 16-101
Christchurch
Phone: +64 3 3428860
Fax: +64 3 3428820
E-mail: info@nzseedlab.co.nz

United States USML05

Agri Seed Testing, Inc.
1930 Davcor Court SE, Salem, Oregon 97302
Phone: +1 503 585 1440
Fax: +1 503 5880733
E-mail: agriseedtesting@comcast.net

New accreditations

France FRML08

F.N.P.S.M.S. Laboratory
21 chemin de Pau, 64121 Montardon
Phone: +33 5 59 12 67 32
Fax: +33 5 59 12 67 10
E-mail: michele.greco@agpm.com

Romania ROML06

Monsanto Romania Srl., Sinesti Plant
E 85/DN2 Road, Urziceni, km 36+200, No. 600-611/1
927220 Sinesti, Ialomita County
Phone: +40243 207 718
Fax: +40243 207 780
E-mail: florina.palada@monsanto.com

Uganda UGML02

Chemiphar (U) Ltd.
P.O.Box 25525, Kampala
Phone: +256 41 268 882
Fax: +256 41 268 834
Email: annick.uytterhaegen@chemiphar.com

United States USML04

Seminis Vegetable Seeds, Inc.
2700 Camino del Sol, Oxnard, CA 93030-7967
Phone: +1 805 918 2337
Fax: +1 805 9182424
E-mail: drew.johnson@seminis.com

USML07

Oregon State University Seed Laboratory
3291 Campus Way, Corvallis, OR 97331
Phone: +1 541 737 4464
Fax: +1 541 737 2126
E-mail: seedlab@oscs.oregonstate.edu

Termination of accreditation

Vietnam VNDL01

NCVESC, Seed Testing Laboratory Hanoi
6 Nguyen Cong Tru Str., Hanoi
Phone: +84 4 821 3453
Fax: +84 4 971 2054
E-mail: ncvesc-dung@fpt.vn

ANNOUNCEMENT

ISTA Workshop on Variety Testing: an introduction to protein electrophoresis and PCR for GMO detection

Bangalore, India, 9–13 November 2009

Location

Indo-American Hybrid Seeds (India) Pvt. Ltd, Bangalore, India

Workshop content

General information on the applications and hands-on experience of electrophoresis and PCR-based methods in the fields of variety verification and GMO detection. These will cover:

Variety verification

- Object, field of application and general principles of the verification of species and cultivars
- Seed storage protein analysis
- Testing of seed storage proteins with IEF, PAGE; SDS; isozymes: Protein extraction, gel preparation up to the evaluation of the gels

Practical work

- Isoelectric focusing in ultrathin layer (IEF) of seed storage proteins: *Zea, Triticum, Oryza, Capsicum*
- Isozymes: *Zea*
- Extraction of different protein classes
- Production, loading and running of gels
- Evaluation of results
- ISTA method for maize and sunflower and adaptation of methods for special questions

PCR testing

- A primer on sampling and testing design for low-level presence of biotech seed
- DNA isolation and quantification
- Introduction to the polymerase chain reaction and its applications
- Introduction to real-time PCR
- Practical considerations in setting up a PCR lab.

Hands-on lab

- CTAB DNA isolation, DNA quantification
- Qualitative PCR of 35s promoter and endogenous gene control in maize
- Quantitative, event-specific PCR of transgenic corn

Local organiser

Dr. G.V.Jagadish
Indo-American Hybrid Seeds (India) Pvt. Ltd.
Seed Laboratory
7th km, Banashankari-Kengeri Link Road, Bangalore, India
jagadish@indamseeds.com
Phone: +91 80 2864499 Fax: +91 80 28602912

Lecturers

Variety identification: Norbet Leist, Rainer Knoblauch
PCR Testing: Benjamin Kaufman, Christoph Haldemann

Registration

Number of participants: 20
Fees: Members: EUR 600 Non-members: EUR 700

Deadline for registration

15 September 2009

Bank details

Indo-American Hybrid Seeds (India) Pvt Ltd
Account No. 0408261010631, at:
Canara Bank, Jayanagar Shopping Complex Branch
4th Block, Jayanagar, Bangalore 560011 (India)
Tel: +91 080 26630880
Through:
Canara Bank, Foreign Department
44/45, Residency Cross Road, Bangalore 560025
SWIFT code: CNRBINBBLFD Tel: +91 080 25582520

Routing details of Telex transfer

By crediting the amount to USD Account No. 001-1-395969 with chips UID-107777 with the CHASE MANHATTAN BANK , NEW YORK maintained by Canara Bank, Bangalore for further credit to Canara Bank Shopping Complex Branch, Bangalore-560011 to the current Account No. 0408261010631 of Indo-American Hybrid Seeds (India) Pvt Ltd., Bangalore by Swift CNRBINBBLFD through MT-100 Routing No. 021000021. Please fax us the copy of the payment details for our follow up.

Accommodation

The President
79/8, Diagonal Road (Elephant Rock Road)
3rd block, Jayanagar, Bangalore 11
Tel: 080 41808777 Fax: 080 41808700
www.presidenthotel.in enquiry@presidenthotel.in
Comfort single: EUR 47; comfort double: EUR 54
Luxury single: EUR 67; luxury double: EUR 74
Studio single/double: EUR 80 €; extra bed: EUR 10

Hoysala
212, Subedar Chatram Rd, Seshadripuram
Tel: 23464300, 23464301, 23464307; mobile: 9845291253
Fax: 080 23316097
www.hotelhoysala.com hotelhoysala@mantraonline.com
Single: EUR11; double, non-air conditioning: EUR 18
Double, air conditioning: EUR 24

Hotel Chancery
Lavelle Road, Bangalore www.chanceryhotel.net
Single: EUR 95; double EUR 112

Registration form

The registration form can be downloaded from the workshop detail page at:
https://www.seedtest.org/workshops

ANNOUNCEMENT

ISTA Seed Health Workshop

Angers, France, 2–5 March 2010

Location

GEVES-SNES (Station Nationale d'Essais de Semences)
Rue Georges Morel, BP 90024,
F-49071 Beaucouze Cedex, France
Tel: +33 (0) 2 41 22 58 03
E-mail: snes@geves.fr www.geves.fr

Organizers

Valerie Grimault (valerie.grimault@geves.fr)
Valerie Cockerell (valerie.cockerell@sasa.gsi.gov.uk),

Subject

- Detection of *Botrytis cinerea* on *Linum* seeds and on sunflower seeds
- Detection of *Fusarium* spp. on wheat seeds

Three and a half days will be devoted to the 3 pathogens; registration will not be possible for only 1 or 2 pathogens)

Preliminary program

Fusarium spp: chaired by V. Cockerell
Lectures:
- Introductory lecture on *Fusarium* spp. of wheat: taxonomy, epidemiology and mycotoxins. Invited speaker.

Technical lectures and discussions:
- ISTA Method 7-022 (V. Cockerell)
- Morphological identification of *Fusarium* spp. (I. Serandat)
- Identification of *Fusarium* spp. by PCR (R Mathis)

Demonstrations/training:
- Training on pure cultures and contaminated seed lots: morphological identification of *Fusarium* spp.
- Demonstration of PCR identification on pure cultures

Botrytis: chaired by V. Grimault
Lectures:
- Introductory lecture on *Botrytis cinerea*: taxonomy, epidemiology. Invited speaker

Technical lectures and discussions:
- ISTA proficiency test on ISTA Method 7-007 (*Botrytis* on sunflower) (V. Grimault)
- ISTA Method 7-007 (*Botrytis cinerea, Linum*) and other fungi infecting *Linum* seeds (I. Serandat)

Demonstrations/Training *Botrytis cinerea,Linum*:
- Training on pure cultures and on contaminated seed lots: morphological identification of *Botrytis cinerea* and other pathogens infecting *Linum*

Demonstrations/Training *Botrytis cinerea and* sunflower:
- Training on pure cultures and on contaminated seed lots: morphological identification of *Botrytis cinerea*

General demonstrations:
- Demonstration of deposit of seeds and incubation

Perspectives, general lecture:
- New molecular methods for multipathogen detection on seeds, the example of macroarray technique (P. Simoneau, University of Angers)

Social event, Thursday 4th March

- Visit to mushroom caves
- Official dinner in a Troglodyte restaurant

Registration

The workshop is planned for 20 participants.

Registration fees:

EUR 360 for ISTA Members (Laboratory Member or Technical Committee Member)
EUR 530 for non-members

Registration deadline:

1 November 2009

Accommodation and transport

Hotel de la Gare: for one night incl. breakfast: EUR 83 € for a twin bedroom, 80 € for a single bedroom.
Hotel de France: one night incl. breakfast: 125 € for a single or double bedroom.
A bus will transport participants from the hotels to GEVES-SNES.

Registration form

The registration form can be downloaded from the workshop detail page at:
https://www.seedtest.org/workshops

ANNOUNCEMENT

ISTA Workshop on GMO Testing
Oberschleissheim, Germany, 8–13 June 2010

This workshop is a pre-Congress workshop of the 29th ISTA Congress, Cologne, Germany.

Location

Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit (Bavarian State Office for Health and Food Safety)
Oberschleissheim, Germany

Organizers

Dr. Ulrich Busch, Head of the biomolecular unit
Benjamin Kaufman, Member of the ISTA GMO Task Force

Preliminary programme

Further information and a preliminary programme will be available soon at http://www.ista-cologne2010.de/

ISTA Workshop on Viability and Germination Testing
Augustenberg, Germany, 10–13 June 2010

This workshop is a pre-Congress workshop of the 29th ISTA Congress, Cologne, Germany.

Location

Landwirtschaftliches Technologie Zentrum (Agricultural Technology Park) Augustenberg, Germany

Organizers

Dr. Andrea Jonitz, Head of Seed Testing Station Augustenberg
Dr. Günter Müller, Chair of ISTA Proficiency Test Committee

Registration fee

EUR 250 for ISTA Members
EUR 375 for non-members.

Preliminary programme

Further information and a preliminary programme will be available soon at http://www.ista-cologne2010.de/

ISTA Workshop on Species and Variety Testing and Proteinelectrophoresis
Hanover, Germany, 11–13 June 2010

This workshop is a pre-Congress workshop of the 29th ISTA Congress, Cologne, Germany.

Location

Bundessortenamt (Federal Plant Variety Office), Hanover, Germany

Organizers

Gabriele Kerschbaumer, Provisional Head of the Laboratory Section
Cornelia Tepper, Senior Analyst
Nora-Sophie Schmidt, Member of the National Organizing Committee for the ISTA Congress 2010

Registration fee

EUR 250 for ISTA Members
EUR 375 for non-members.

Preliminary programme

Further information and a preliminary programme will be available soon at http://www.ista-cologne2010.de/

8th ISTA Seminar on Statistics in Seed Testing
Aussonne, France, 7–10 April 2009

Kirk Remund
Vice-Chair, ISTA Statistics Committee

Life Sciences Company
St. Louis Q2A, Missouri, USA
kirk.m.remund@monsanto.com

The 8th ISTA Seminar on Statistics in Seed Testing was held on 7–10 April 2009 in Aussonne, France, and hosted by Pioneer Génétique. There were 23 participants from six different countries from industry and government laboratories. It was a pleasure to have Dr. Michael Muschick and Norberto De Atrip in attendance from the ISTA Secretariat. The host and organizer for this seminar was Jean-Louis Laffont (ISTA Statistics Committee Chair).

The program included a rich mix of the statistical theory of seed testing and practical topics, including statistical distributions and tests, data checking, linear models, seed testing plans, ISO laboratory uncertainty applications, sampling and a survey of statistical software. Jean-Louis Laffont, Kirk Remund, Zivan Karaman, Bonnie Hong and Mustapha El Yakhlifi gave statistical presentations and led the discussions with the participants during the seminar. There was much engaged discussion between the presenters and the participants on statistical aspects of laboratory practice and issues. Much learning and increased understanding was had by all, the presenters included. Many participants expressed satisfaction in their new-found understanding of statistical principles and methods that they were eager to apply in their own labs upon returning home.

A wonderful excursion was taken to the enchanting medieval city of Carcassonne. The participants enjoyed a tasty lunch of cassoulet (a regional specialty), followed by a tour of the old city and of course shopping! Another memorable experience of the seminar was the official dinner, held at the La Belle Chaurienne restaurant, situated on a boat on one of Toulouse's canals, where a sumptuous meal was served which included foie gras, another regional specialty!

Special thanks

We would like to offer special thanks to Charlotte Philip and Valerie Ancelin for making the arrangements for the seminar and excursions and their kind care of all participants and presenters. Thank you so much! We also wish Charlotte well as she will have a new addition to her family very soon. Good luck!

1st ISTA Workshop on Molecular Markers for Variety Identity and Purity
Bologna, Italy, 10-13 June 2009

Ana Laura Vicario
Vice-Chair, ISTA Variety Committee

Instituto Nacional de Semillas INASE
Laboratorio de Marcadores Moleculares
1063 Buenos Aires, Argentina
alvicario@inase.gov.ar

Last June, the 1st ISTA Workshop on Molecular Markers for Variety Identity and Purity was held at the Seed Research and Testing Laboratory (LaRAS) of the Department of Agroenvironmental Sciences and Technologies of the University of Bologna.

This first ISTA workshop on DNA-based markers attracted participants from all over the world: Austria, Germany, the Netherlands, Serbia, Spain, Sweden, Taiwan, Ukraine, the United Kingdom, Canada, Italy, and Argentina. During the meeting, several subjects regarding variety testing were discussed: overview of morphological, biochemical and DNA-based markers, basic concepts of the polymerase chain reaction, different types of markers, with focus on PCR-based markers (SSRs, SCARs, SNPs), assay design and optimization, introduction to programmes for data analysis, and an overview on the work carried out by the Variety Committee. There was also laboratory work, where participants could extract DNA from seeds and leaves, and compare various quantification methods and separation, visualization and genotyping systems.

The presentations were given by Daniel Perry from the Canadian Grain Commission, Enrico Noli and Emanuela Casarini from LaRAS, and Ana Vicario from the National Seed Institute. The laboratory work was led by the working group within LaRAS, Elena Battistini, Silvia Scacchi and Maria Teriaca.

All the presentations and laboratory instructions were included in the official workshop folder and on a CD, with also some pictures taken during the workshop.

In general, the seventeen participants from governments and private companies learned, discussed and enjoyed the pleasant atmosphere during this ISTA Workshop.

On Friday evening all the workshop participants had a great dinner in the hills near Bologna.

On behalf of the lecturers and participants, I would like to thank the local organizer, LaRAS and its staff, and the staff of the ISTA Secretariat, for all the work done to make this a successful workshop.

ISTA Quality Assurance Workshop
Bassersdorf, Switzerland, 11–13 June 2009

Jette Nydam, Mary Jane Kelly and Branka Opra
ISTA Accreditation Department

ISTA Secretariat
8303 Bassersdorf, Switzerland

The winners of the end-of-workshop competition

A Quality Assurance workshop was held at the ISTA Secretariat in conjunction with the ISTA Annual Meeting 2009. It was successfully advertised and 30 participants from 20 different countries arrived to take part in the three day program.

The instructors included both of the system auditors, Jette Nydam and Mary Jane Kelly from the Accreditation Department of the Secretariat as well as technical auditor, Joël Léchappé, head of the National Seed testing Station – G.E.V.E.S. in Angers, France. Ronald Don, chair of the Germination Committee, unfortunately for all involved, could not take part as a lecturer, due to the other ISTA commitments.

The following subjects were covered using practical and theoretical exercises which involved both individual and group work:

- Internal Quality Control, presented by Jette Nydam
- Non-Conforming Work, presented by Mary Jane Kelly and Jette Nydam
- Technical Issues, presented by Joël Léchappé
- General Matters, presented by Jette Nydam

Internal Quality Control is one of the ISTA Accreditation Standards and a good way to give an overview of the performance in the laboratory. Some examples given in the training included the use of half-working samples and spiked samples in purity, ring tests in germination and /or retesting of one sample every week. When enough data is collected, as the group was shown, trends become visible and statistical analysis of the results can be carried out. This will ensure that non-conforming work will be detected and preventive actions put into place to ensure that it will not matter who in the laboratory is sampling, testing or evaluating or which equipment is used. Three exercises on trend analysis given in the morning session were carried over and completed in the afternoon when participants were given further information to solve them. They had to analyse the data, identify a root cause for the problems and come up with corrective actions.

The control of non-conforming work in testing and sampling is also one of the ISTA Accreditation Standards and laboratories must have a policy and procedures in place to deal with it. The participants were asked to design a form for reporting non-conforming work, the root cause of it, corrective and preventive actions put in place and then the follow-up measures taken

Those still in Zurich on the Saturday after the Workshop went on a guided tour of Zurich

St. Peters's Church has the largest clock face in Europe – 8.7 m in diameter

before the incident could be closed off. Another individual exercise involved deciding on whether or not six different incidents really were non-conformities.

Dr. Léchappé presented technical topics which included errors, corrections/adjustments, uncertainty of measurement, tolerances and conformity of equipment - in this case, balances and thermometers. The several hands-on exercises had everyone busy doing calculations. The group enjoyed the challenges he presented to them and there was much discussion generated.

The General matters subject included four workgroups with following topics: Purchase policy, Follow-up on PT performance, Calibration of equipment, and Management, organization and validation of software. Each workgroup was asked to deal with all of the questions on each topic but then were assigned one of the topics to prepare for presentation to the other groups.

The final hour of the Workshop was devoted to the presentation of a "Jeopardy-style" quiz show. Participants of this game were divided into five teams. Shown on a screen were five main categories each containing five questions. The categories were as follows: ISTA Rules, Orange International Certificates, the ISTA Accreditation Standard, Quality Assurance and Audits. This was a fun, stress-relieving exercise to finish off a busy two days.

The solutions to all exercises were provided in hardcopy format in each participant's binder. The course evaluation forms were very positive and everyone appreciated the practical examples taken from real life experiences that were used in the presentations.

A workshop excursion to the city of Zurich took place for interested participants. There was a guided tour of 2 hours walk through the very heart of Zurich, finishing at the Zurich' lake. With perfect Saturday weather a nice lunch was organised on the terrace of the Zurich famous fish restaurant. Afterwards, participants enjoyed the peaceful atmosphere in the nearby China garden and went for a boat tour. Late afternoon was reserved for 'window-shopping' at the 'Bahnhofstrasse', one of the most expensive streets in the world. ■

CALENDAR

2009

19–23 October **ISTA Workshop on Quality Assurance in Seed Testing, Palmerston North, New Zealand**
www.seedtest.org/workshops

9–13 November **ISTA Workshop on Variety Testing: an introduction to protein electrophoresis and PCR for GMO detection, Bangalore, India**
www.seedtest.org/workshops

2010

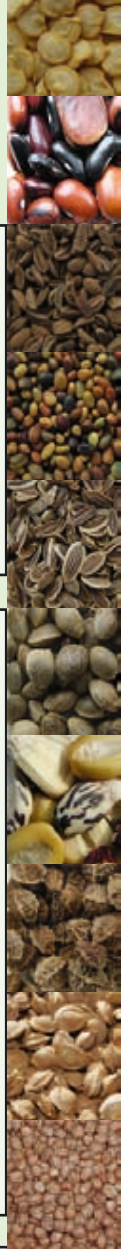
2–5 March **ISTA Seed Health Workshop, Angers, France**
www.seedtest.org/workshops

8–13 June **ISTA Workshop on GMO Testing, Oberschleissheim, Germany**
www.ista-cologne2010.de

10–13 June **ISTA Workshop on Viability and Germination Testing, Augustenberg, Germany**
www.ista-cologne2010.de

11–13 June **ISTA Workshop on Species and Variety Testing and Proteinelectrophoresis, Hanover, Germany**
www.ista-cologne2010.de

16–22 June **29th ISTA Congress, Cologne, Germany**
www.ista-cologne2010.de



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International Seed Testing Association (ISTA)

ISTA Secretariat
Zürichstrasse 50
CH-8303 Bassersdorf
Switzerland

Phone: +41 44 838 60 00
Fax: +41 44 838 60 01
E-mail: ista.office@ista.ch

www.seedtest.org