INFORMATION DOCUMENT FOR THE ISTA ORDINARY MEETING

Minutes of the Ordinary Meeting 2011

This document includes the comments received within the two months period as defined in the ISTA Constitution Article X(f). The comments were accepted by the Executive Committee decision number 656. These minutes including comments received are therefore considered approved and are published on the ISTA website.

Any comments about these minutes will be considered at the Ordinary Meeting 2012 to be held on Thursday, June 14, 2012 at the World Horticultural Expo (Floriade 2012), Venlo, the Netherlands, under Agenda point 4. Comments about the Minutes of the previous meeting.
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The Ordinary Meeting of the Association

[DR100_201.mp3 00:00]

Welcome by the ISTA President, Mr. Joël Léchappé (France)

**Official Address by Mr. Junya Endo, Director of Intellectual Property Division, Agricultural Production Bureau, Ministry of Agriculture, Forestry and Fisheries of Japan**

After the Official Address, The President presented Mr. Endo with a commemorative gift.

**Presentation on the Development of the Seed Industry in Japan by Madoka Koshiibe (Japan), Chairman of the Board, Mikado Kyowa Seed Co. Ltd.**

Mr. Koshiibe also received a commemorative gift from the President.

1. **Call to Order**

[DR-100_202.mp3 02:00]

The President of the Association, Joël Léchappé, began the meeting by remarking that around 200 people from 55 countries were present.

2. **President’s Address**

The President welcomed new ISTA members, and representatives of international organizations: Dr. Michael Ryan (OECD), Mr. Tom Osborn (FAO), Dr. Piero Sismondo (ISF), Prof. Dr. Alison Powell (ISSS), Dr. Francisco Carlos Krzyzanowski (ABRATES, Brazil), Dr. Rui Qing Huang (APSA), Mr. Gil Waibel (AOSA/SCST), and Prof. Dr. Attilio Lovato, ISTA Honorary President.

The President thanked the former President, Prof. Dr. John Hampton, who served the Association for many years as an active Chair, Vice-Chair and member of several Committees, as Associate Editor of Seed Science and Technology, and in the Executive Committee since 2001, for his services and for his dedication and work for the Association.

He thanked the Germination Committee, with its Chair Ms. Sylvie Ducournau and Vice-Chairanny van Pijlen, assisted by Ronald Don and Christof Neuhau, for the successful running of the Germination Seminar on the previous Monday.

He remarked that the meetings of the Committees with the presentations of their technical work demonstrate the very productive activity and motivation of the ISTA Members, and that the Ordinary Meeting was a very important time for our Association.

**Agenda of the Ordinary Meeting of the Association**

1. Call To Order
2. President’s Address
3. Roll Call of Designated Members entitled to vote
4. Reading and Acceptance of Minutes
5. Report of the Executive Committee
   a) Executive Committee response to the Ordinary Meeting decision to investigate the possibility of issuing of multiple seed certificates (*motion from the Netherlands, OM2010*) Grethe Tarp (Denmark)
b) Executive Committee response to the Ordinary Meeting decision to review the audit process (motion from Australia and New Zealand, OM2010) Rita Zecchinelli (Italy)

6. Report of the Secretary General
7. Constitution Changes
8. Fixation of Annual Subscriptions
9. Consideration and adoption of the proposed Rules Changes 2011
10. Consideration and adoption of the Reports of the Technical Committees
11. Announcement of the place and date of the next Ordinary Meeting
12. 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
13. Any other business raised by consent of the Executive Committee
14. President’s closing address
15. Adjournment

The President referred to the documents distributed to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organisations for information two months prior to the ISTA Ordinary Meeting according to the ISTA Constitution, as well as published on the ISTA website.

He informed the meeting that all proposals for voting were sent out in due time two months before the Ordinary Meeting, and invited all to give their opinion and to take part in the discussions.

The President then gave the floor to the Secretary General, Michael Muschick, for the roll call.

3. Roll Call of Designated Members entitled to vote

[00:06:00]

The Secretary General first addressed the question of the quorum. The total number of countries entitled to vote during this Ordinary Meeting was 72. To reach a quorum following the ISTA Constitution Article X (d), 29 Voting Members therefore needed to be present in the meeting room at all times. Before the Ordinary Meeting, the ISTA Secretariat had already checked the credentials and identified the nominated Designated Members from the registration list, and given them their voting cards.

The Secretary General established that all Designated Members had their voting documents, and the ISTA Secretariat conducted a head count of the delegates. There were 43 delegates in the room, and the Secretary General declared the meeting quorate.

Mrs. Jette Nydam (Denmark) and Mr. Stanley Matthews (United Kingdom) were asked to serve as official vote counters for this meeting. Since there were no objections from the floor, these persons were appointed to be vote counters.

[00:09:30]

The Secretary General then clarified the voting rights according to ISTA Constitution Article IX(a), which states that irrespective of the number of Designated Members designated by a single government, only one vote may be cast on behalf of that
government. There were further clarifications in regard to the voting procedure as determined by the Executive Committee, as follows:

- Majorities will at all times be based on those actually voting on any motion, not those eligible to vote.
- The number deemed to be voting is the sum of the “Yes”, the green cards and the “No”, the red cards. An abstention is a decision not to vote, and therefore has no effect on the calculation of the votes.
- The required majority, two thirds or simple, is calculated from the number voting. The actual numbers required for a two-thirds majority may therefore differ for each motion.
- For simple majority voting at Ordinary Meetings of the Association, if a clear majority of either ‘yes’ or ‘no’ cards could be identified by viewing the audience, the votes will not have to be counted. For simple majority voting, vote counts will be made on request from a Member present in the room, or on request of the President if in doubt.
- With the right to vote goes the right to abstain from voting, but the President will not call for abstentions.
- For any vote to be valid, the meeting must be quorate.

[00:11:30]

The Secretary General reminded the delegates about the day’s decisions, which would require a two thirds majority:

- The proposed changes to the ISTA Constitution.
- Any motion arising during the Ordinary Meeting and relating to temporary adjournments, closing of debate or postponement of action.

All other decisions to be taken would require a simple majority.

Voting Delegates wishing to make a motion following the Rules of Order should raise both voting cards.

The Secretary General also informed delegates about the Rules of Order for the Ordinary Meeting, as adopted at the Ordinary Meeting 2007.

This concluded the roll call.

4. Reading and Acceptance of Minutes

[00:13:00]

The President asked the Secretary General to read the Minutes of the last Meeting.

The draft Minutes of the Ordinary Meeting 2010 were displayed on the screen. The Secretary General also reminded the Delegates that they had received the Minutes at the beginning of March, following the Constitution, two months before the current Meeting, and asked whether there were any questions or points that required clarification.

The Secretary General drew attention to a question from Jeffrey Luhanga (Malawi), who had enquired about cooperation in Africa with COMESA, to which the Secretary General had agreed. As a follow-up to this point, the Secretary General reported that he had visited the Director general of COMESA together with ECOM member Mary Chipili. After intensive discussions it was agreed that ISTA would be invited to participate in one of the meetings of the Ministers of Agriculture for the COMESA region, and it was hoped that this would take place in the 2nd half of 2011.

There were no comments from the Meeting, and the Minutes were accepted by applause.
5. Report of the Executive Committee

[00:15:00]

The President gave the floor to the Officer of the Association, Francisco Krzyzanowski (Brazil), who invited the President to present the Report of the Executive Committee.

The President reminded the participants that the Report of the Executive Committee had been published by the Secretariat on page 4–8 of the document ‘ECOM-OM11-03’. As required by the Constitution, the document had been distributed to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organisations for information two months prior to the ISTA Ordinary Meeting. A Powerpoint presentation was presented with details of the official report.

The President then presented the report as published in the above-mentioned document.

The President:

“The progress of the Association, encouraged and led by the ECOM, has been presented during this week, and more will be presented and summarized during the Secretary General’s report. This report focuses on the main actions of the ECOM, and it will finish with the President’s thoughts and visions for ISTA.

“The Executive Committee works as a team, together with the Secretariat, and it’s a real pleasure to serve the Association. In November 2010, the new Executive Committee had to reorganize, and Francisco Carlos Krzyzanowski was appointed as Officer, and his function is to assist the President to compensate for the vacancy of a Vice-President. Craig McGill from New Zealand was appointed by the Executive Committee as a Member-at-Large to fill the vacant position in the Executive Committee. All areas of the world are represented in the Executive Committee.

“This Report is based on the ISTA Strategic Plan, accepted by the membership at the ISTA Congress in Cologne last year, and this Strategic Plan lists seven key areas of activity: the membership, development of methods and Rules, accreditation, facilitation of seed movement, dissemination of knowledge, communication, and management of ISTA affairs.

“Membership:

The membership is increasing regularly, and new members are coming from all regions of the world, supported by the efforts of the ECOM representatives in each region. You are welcome to contact your ECOM representative.

“Development of methods and Rules:

The development of methods and Rules is the heart of ISTA, and is a major goal of the Executive Committee. The annual rhythm of Ordinary Meetings has increased significantly the production of methods and Rules. The year of the Congress is the year of building the Working Programmes in the Technical Committees. When approving the Working Programmes of the Committees, presented by the Chairs, the ECOM is very attentive that ISTA anticipates of replies to requests from the seed sector, governments and the seed industry. Topics include seed mixtures, the detection of Orobanche, the detection of Ustilago nuda, Pyrenophora, the motion from the Netherlands on the use of multiple Orange Certificates for sublots, the seed lot size of herbage seed lots, statistical tools, and many others not cited, but which were presented yesterday and the day before.

“Accreditation:

The accreditation programme is one of the pillars of the Association, strengthening the application and use of the tests in the laboratories. It guarantees harmonization, traceability and a very high quality of the tests performed. It is an inestimable tool for the facilitation of trade. The ECOM, with the Accreditation Department, tries to match
QA requirements with reality by attending to the needs of Members and stakeholders. For example, two major topics were studied very carefully: the adoption in Cologne by the Membership of the motion of New Zealand and Australia to review the audit process, and the results of the in-depth analysis carried out by the Secretariat and the ECOM, will be presented by Rita Zecchini and discussed today. The second point of the current example is to what extent must accredited laboratories implement check sampling to monitor samplers. It is cost versus guarantee of sampling, and sampling and monitoring of samplers is specific to the ISTA accreditation standard, and it is the basis of the added value of the Orange International Seed Lot Certificate. These questions, therefore, require careful consideration and detailed studies. The third point: the Accreditation Department, in close collaboration with the Sampling Committee, are working hard on it.

[00:22:00]

“Facilitation of seed movement:

The Executive Committee and the Technical Committees are working very closely together to set priorities. The following examples illustrate important topics studied in response to demands from the seed trade: ISTA/ISF grass seed lot size, seed mixture experiment, and, as mentioned before, the response to the Netherlands’ motion on multiple seed lots. There are regularly new demands and new needs identified. One, for example, with ISF on sampling expensive small seed lots for health and/or germination, or sampling for detection of Orobanche. These topics have been included in the Technical Committee Working Programme. A new issue to be discussed is the need for a standard dust test in seed lots.

“Dissemination of knowledge:

Two activities should be highlighted: the close collaboration between ISTA and the International Society for Seed Science, and between ISTA and the Royal Botanic Gardens in Kew, under the leadership of Alison Powell and the Working Group on Seed Science. The presentation was given by Alison on Wednesday during Session 4 of the presentation of the technical work. The second activity is the follow-up on training after the Zurich seminar, with the publication on the ISTA web site of training objectives, strongly supported by the ECOM policy. This was presented yesterday by Alison.

“Communication:

The relationships with other international and regional organizations are subject to special efforts. The Secretary General, Michael Muschick, and the President represent the Association as much as possible at meetings of the OECD, the ISF, UPOV, the FAO, ESA and other important associations. Also, ECOM members have for several years now been representing ISTA in their regions. Let’s say that, after several meetings, I have got the impression that with some organizations not cited before, ISTA activities are poorly known. In some regions, better understanding would avoid overlapping and contribute to better service and optimization of seed quality control. Surprisingly, among them is Europe. We, as ECOM members, and the Secretary General are working to improve communication with these organizations.

“Management of ISTA affairs:

The cooperation between the Executive Committee and the Technical Committees has been significantly improved by several actions started by Katalin Ertsey and John Hampton. First is a strengthening of the support role, with each member being a contact to a TCOM. There is also the guideline “Responsibilities of ISTA TCOMs available on the ISTA web site, and, every three years, the validation by the Executive Committee of the Technical Committees’ Working Programmes, which was done this time in February 2011. The Secretariat has also been engaged in a detailed review and reorganization of its work, with the goal of managing the excessive workloads, but responsive to Members needs. A preliminary analysis was made with the assistance of a consulting firm, approved by the ECOM, which has led to a new organization structure to meet current and future needs. The motion of Australia and New Zealand on the review of the audit process is also one of the reasons for the review of this organization, and this review will be followed, as decided by the Executive
Committee, by a review of the costs linked to the accreditation, to allow the publication of transparent and accurate costs. I am confident of the ability, professionalism and experience of the Secretariat to carry out this important change.

“Now let’s finish with the President’s vision: The primary aim is to build on the foundation already built by Katalin and John. ISTA is a dynamic and productive association, with the potential to grow and to evolve. I wish to continue to strengthen the work of the Technical Committees, the Rules, the science, via symposia and publications, and the accreditation. This together forms the heart of ISTA. ISTA must continue to develop new areas of testing, such as GMOs, dust testing, seed mixtures, sampling, molecular testing, vigour testing, phentyping and others. All parts of the world must also be able to participate in ISTA. The relationship with the governments and the other international organizations such as ISO, ENGL, ESA, ISF are fundamental. And it is fundamental to work together with governments and international organizations dealing with seeds, to convince the governments and organizations outside of the seed testing world, such as ISO or ENGL, that basic tests, such as purity or germination, shall not be taken for granted, but more effort should be made to support and develop them. Above that, the new attractive tests on seeds, such as molecular tests, shall be developed with ISTA, instead of outside as today, for example, the initiative of ISO to develop tests on seed testing. This has to be done within ISTA, in order to maintain the international harmonization and the coherence of the seed sector.

“To conclude: you are invited to promote harmonization via ISTA every time you are involved in national or international topics dealing with seed testing. To achieve this, organizing and focusing the association’s efforts are very important, and will take time. As your President, I’m well motivated and very well supported by the Executive Committee sitting in the first row in this room and all the Members to help lead our Association into the future, and I welcome your thoughts and your comments. Thank you very much.”

[00:31:00]

Piero Sismondo (ISF):

“First of all I would like to thank you, Mr. President and Mr. Secretary General, for the invitation to be here for these four days. It has been very educational to me, and I think that this kind of exchange is extremely important for the two associations that we represent, because it gives to us, the so-called private sector, the possibility to interact with you, the so-called public sector, and work together with the aim of reaching a common objective. I have just heard from you that there is another organization that is trying to work on germination tests. I think that this is a little bit risky; I would like that, again, jointly, we develop, if not an initiative, at least an answer to this action, because the experience that I have in more than 30 years in the seed industry tells me that seed is something different from everything else. It is a living thing, very little, very peculiar, so we need experts, we need people that have built experience in 5, 10, 15, 20 years or maybe all their lives, to be able to speak of seed. I would like to express my congratulations to all of you, for the quality of the presentation that we heard, and for the content of them. I think, again, that if we can work jointly, ISF and ISTA, we can progress very well for the benefit of the seed industry. There were mentioned in the President’s presentation several topics that are very “hot” for the seed industry. One of them is GMO testing; another one that I would like to mention is the minimum size of a sample for seed testing, especially for the vegetable sector, where (as I mentioned on Monday) the cost of the seed is extremely high. So we need to be very careful in looking what is the minimum quantity to still provide good results. The 25 tonnes lot experiment: this is something that is very close to me, and very touchy; I just wanted to call your attention to timing. Today, the world economy is moving forward fast, I would say even faster than what we may imagine, and the seed companies have to adapt to this movement very quickly. So I’m really wishing that we can set a road map so that we can meet our target of 2012, in order to have the approval for this possible new regime in time.

“To end my speech: I would like to thank all of you, as organizations, but also as individuals, for the support that you provide to the seed industry every day of the year,
when you make tests, when you answer to very specific requests from the seed industry, there is a reason behind. So communication is very important. You made a good point, Mr. President, we must communicate today what we do in order to let the public opinion understand why something happens. So it’s not because we dream something. So thank you very much for this, and a little message I would like to give you, in order to let you feel a little bit proud, or very proud of what you do: the seed industry and you together have the objective of providing farmers the best quality seed in order to make sure that agriculture can feed the world of the third millennium. Thank you very much.”

Joël Léchappé (President):

“A precision regarding the outside organizations: they are looking for germination, but mostly for GMOs and seed health harmonization of tests. That’s even broader than mentioned.”

Mable Simwanza (Zambia) enquired whether it were possible to know the reason why John Hampton resigned.

The President replied that at the end of October 2010, John Hampton had sent a letter to the Executive Committee saying that he would resign for personal reasons, and that that was all the information they received.

There being no further comments or questions, Francisco Krzyzanowski asked for approval of the President’s report by applause, which was granted.

To continue the Report of the Executive Committee, Francisco Krzyzanowski invited Grethe Tarp, member of the Executive Committee, to give the Executive Committee’s response to the Ordinary Meeting decision to investigate the possibility of issuing multiple seed certificates (motion from the Netherlands at the Ordinary Meeting 2010).

Grethe Tarp (Denmark):

“Ladies and gentlemen, colleagues:

Joost van der Burg presented at the Ordinary Meeting last year a proposal from the Netherlands to allow issuing multiple seed certificates of the same value and status for one seed lot. The Ordinary Meeting decided that ISTA should develop a proposal to be presented and discussed at the Ordinary Meeting 2011.

“The proposal includes the possibility to allow issuing multiple certificates with the same status and value as the OIC for the original seed lot, by means of one seed lot sampling, that results in one set of testing results, and that will then result in the possibility of issuing original OICs covering only a part of the original seed lot.

“Now, to elaborate a proposal on how that could be done, we looked first at the ISTA Rules, to identify what the Rules say about issuing of OICs. In §1.2.2, it is stated that in case of Orange International Seed Lot Certificates, the results reported refer strictly to the lot as a whole, at the time of sampling, and the seed lot must fulfil the requirements described in Chapter 2, the Sampling chapter. The seed lot must be sampled according to Chapter 2, and only one OIC can be valid for a lot at one time for any particular test. Every container in the lot must be marked with the same identification mark as the OIC, and all information stated by the applicant, such as the weight of the lot, must be entered in the right place on the Certificate, as well as the number of containers in the lot, the place, date and country of issue of the Certificate. In relation to validity, a new original OIC may be issued for the same lot only if a new submitted sample from that lot is taken and tested. Any previous Certificate is cancelled by the latest Certificate issued on the same seed lot, under the same reference, for the same particular tests. The reference dates are, in order of priority: the date of sampling, the date the test was concluded, and the date of issuing the Certificate.

[00:42:00]
“I will now present the proposal. The Position Paper “Representativeness of an ISTA Orange Seed Lot Certificate for sublots” of the Bulking and Sampling Committee was used. In this paper, it is suggested to divide the seed lot into a maximum of five sublots without retesting, as long as all sublots are at least 20% of the weight of the whole seed lot. I will describe the proposal now and then invite you for a discussion. This proposal is not for voting this year, only for discussion, for all of us to understand what it is we are talking about and should we really continue to improve this proposal for voting in 2012.

“Under ‘Reporting’ it is proposed that under the section of the OIC stated by applicant, the size of the part of the seed lot for which the particular Certificate is valid must be given. So if the whole seed lot is ten tonnes, the size of the sublot could be two tonnes. Under ‘Number of containers’, the actual number must be given. So if the number of containers in the whole seed lot is 200 bags of 50 kg, the number of containers in the sublot could be 40 bags. Under ‘Other determination’ on the Certificate, it must be stated: ‘The results reported represent the sample drawn from the original seed lot of so many kg. This Certificate refers to sublot No. Y (Y can be from 1 to 5) of the original seed lot’. The restriction to use this Rule is that part of the seed lot must represent at least 20% of the weight, which gives that a maximum of five sublots can be made per seed lot. Consequently, a maximum of six original OICs per seed lot can be made, and that is one for the original seed lot, and five for the sublots.

“I will now go through the suggested additions to the paragraphs which I have just mentioned earlier.

“§1.2.1: it should be added that in case a seed lot is sold in portions, sublots of not less than 20% of the original weight of the seed lot, an OIC may be issued for each sublot. A sublot is one portion of one seed lot. One seed lot can be divided into a maximum of five sublots. Each sublot must be numbered from 1 to 5.

“There are no changes in the requirements in relation to sampling. The Rule that only one OIC can be valid at one time for any particular test is the same for a sublot. There are no changes in relation to the identification mark; maybe it is the same for the sublot as for the original seed lot. But in cases where an OIC has been issued for a sublot, the weight of this sublot must be entered instead, and the number of containers in the sublot must be given, and the date of issue of the OIC should be entered for each single sublot. A new OIC may be issued for the same sublot, provided that a new submitted sample from that sublot is taken and tested, and this new Certificate is only valid for the sublot.

“Now, this might create problems in relation to certification authorities, and we will have to look into this question in more detail. Any previous Certificate is cancelled by the latest Certificate issued from the same sublot under the same reference for the same particular tests. In relation to reference dates there are no changes. Duplicates must be duplicates of the sublot OIC, following the same rules as for duplicates for the original OIC for the whole seed lot.

“Now, the ISTA-accredited laboratories that issue these OICs for sublots must elaborate a system to ensure and keep track of the number of Certificates issued for sublots, and keep track that the original seed lot size is not exceeded. Thank you for listening.

“And now, the ECOM is very interested in your questions and your comments. Do you think that this is a Rule change that should be elaborated for 2012?”

Joost van der Burg (Netherlands):

“Thank you very much, Grethe, for all your efforts to translate our proposal into Rules. The actual suggestion … we should adopt the Rules. There are, however, two issues which I think have not been taken into consideration, and the main issue, actually, for this proposal is that once you have tested a whole seed lot, and you are selling part of the lot, the proposal is to supply a Certificate on this sublot without further testing. And to my surprise I see in your proposal under point 1.6 that it has to be resampled and retested.”
Grethe Tarp (Denmark):
“No, that’s a misunderstanding; no resampling, no retesting. You use the result from the original seed lot.”

Joost van der Burg (Netherlands):
“The other issue is, and it’s a bit difficult to explain, the interpretation from the Bulking and Sampling report is that to be representative, the sublot should not be too small, and there was discussion on how small can a sublot be, in view of possible heterogeneity of the original lot. I fully agree with something like 20% as a minimum, but in practice I think that the present proposal creates some problems and undue administration. Very often, a seed lot is being sold in several batches to several customers. They may even be in different packages and types of packages and sizes of packages, but in most cases there is no requirement for an Orange Certificate; only particular customers, they want to see an Orange Certificate, and our proposal is that for these exceptional cases we have this proposal. Many customers are satisfied with a duplicate Certificate, so this proposal is in addition to the present custom of supplying duplicates. So, in exceptional cases, from one seed lot, one or two Orange Certificates will be required, perhaps, and the relevant thing is that this sublot should not be smaller than one fifth, but there is no evidence that the other parts should not be smaller, because the other parts are not sold with an Orange Certificate, so they can be one tenth of a seed lot, that is irrelevant for the particular Certificate that we are issuing. There may be seven or eight lots, and only one requires an Orange Certificate and that needs to be at least 20%. That is the statistical background. But what happens to the others is not relevant, so I don’t see the point of a maximum of five; automatically, five will arise when you would sell them all with Orange Certificates, but that’s an exceptional case.”

Grethe Tarp (Denmark):
“We are trying to cover the situation where ISTA Certificates should be issued for all sublots from one original seed lot. But of course, if the company only wants one Certificate for one sublot, what happens with the rest of the seed lot, that is no concern of ISTA, as long as there is no Certificate issued on it.”

Joost van der Burg (Netherlands):
“So we don’t need an actual administration, except for those…”

Grethe Tarp (Denmark):
“It depends on how popular this use will be.”

Joost van der Burg (Netherlands):
“Thank you very much.”

Next question:

Charlotte Leonhardt (Austria):
“The way the proposal is written, theoretically another ISTA lab could issue the Certificates for the sublots. Is that true? And if you don’t want that, how can you hinder that, then you need to write something in the Rules that only the lab that was issuing the first Certificate should be able to issue the others. Because who would otherwise check the traceability of the whole amount of the seed?”

Grethe Tarp (Denmark):
“We will have to look into how it practically can be done, and not misused.”

Lea Mazor (Israel):
“I would like to ask you have two questions. One is, if I understand it correctly, will it be possible to issue a Certificate once to the whole lot and then to the sublots, or only for sublots.”

Grethe Tarp (Denmark):

“First you will have to have an Orange International Seed Lot Certificate for the whole lot sampled. Because else you don’t have any results to re-use for the Certificates for any sublot from that lot.”

Lea Mazor (Israel):

“And the second is, sometimes when the company is exporting seed there are countries who ask for different variety names. It’s listed as the same variety, but different name. Will it be possible to overcome it with a sublot?”

Grethe Tarp (Denmark):

“The information of the variety name will be in the box where it says ‘stated by the applicant’. I do not see why that should not be possible, but I think we will have to discuss that. But that could be a possibility. But for sure the reference numbers have to be the same.”

Günter Müller (Germany):

“What is the reason not to use the duplicates for the trade?”

Grethe Tarp (Denmark):

“As far as I have understood, it is that some countries want to have the exact weight of the consignment on the OIC, but Joost can confirm that or not.”

Joost van der Burg (Netherlands):

“That is exactly right, and I think also one of the backgrounds was that using duplicates with incorrect information is something we would not want. But indeed, it’s because of the customers, they require a certain Certificate which exactly reflects what they are going to get.”

Piero Sismondo (ISF):

“First of all I would like to thank you for taking the time for investigating this, that I presume is a request coming from the industry, so it’s going in the right direction. I have just two practical questions, and the first one is, you mentioned the possibility of having five additional Certificates for sublots. Have I understood well that each of these Certificates will be reporting the containers that belong to this sublot?”

Grethe Tarp (Denmark):

“It has to be stated the weight of the sublot, and the number of containers in that sublot.”

Piero Sismondo (ISF):

“Just one very personal comment: if you divide it in exactly five sublots, and for any reason it will not be one fifth, but one fifth and something, that would be sold to another party, you have again the same problem, where there would be no match between the quantity written on the Certificate and the amount delivered. So let’s say we are speaking about ten tonnes. You have five sublots of two tonnes, but the sale would be 2.5 tonnes. So how can you overcome this with this solution?”

Grethe Tarp (Denmark):

“We trust that the companies are able to administrate this.”

Piero Sismondo (ISF):

“My concern is that trying to solve a problem we risk to create another problem.”

Grethe Tarp (Denmark):

“If the sublot is 2.5 tonnes they ask for a Certificate covering 2.5 tonnes.”
Piero Sismondo (ISF):

“But you don’t know it up front. You don’t know it when applying for registration, you know it probably one week later, when making the sale. Anyway, I don’t want to start the discussion here, I understand very well that this is a proposal for discussion, so I’m just giving you some topics for your discussion the next 11 months. And another point is on the double name: I think that this is something that should not appear in the Orange Certificate, this is something related to its synonyms, so it’s out of the scope of this project.”

Lotta Claesson (Sweden):

“I have a question about marking on the lot, not on the sample but on the lot: should it be marked that this part is from subsample 1?”

Grethe Tarp (Denmark):

“No, only on the Certificate.”

Joseph Ahenda (Kenya):

“I just want to seek clarification: will the sublots be distinguishable by lot numbers? Or will they be the same lot number?”

Grethe Tarp (Denmark):

“It will have the same lot number.”

Joseph Ahenda (Kenya):

“But different sublots.”

Grethe Tarp (Denmark):

“Yes.”

Joseph Ahenda (Kenya):

“Another thing is that in a situation where it is that the customer, the company requests for ISTA Certificate, and in their request the volume and all the details about how much is indicated, then the issue of the Certificate is based on the request by the company.”

Grethe Tarp (Denmark):

“So then they can ask for an original OIC without any sublots.”

Joseph Ahenda (Kenya):

“So we don’t see the need for advanced subdivision of seed lots, before marketing. Because the issue of the Certificate is based on the request.”

Grethe Tarp (Denmark):

“But it can be different somewhere else. Because there are some companies that clean the seed, process them, and have them ready in the store, and then they get a customer that only wants a part of that seed lot, and they want an OIC with exactly the amount of KD. So that is part of that sublot, and here this possibility can be a help.”

Mable Simwanza (Zambia):

“While I appreciate that the proposal may be workable, but I still have one concern: in the proposal, the validity of the sublots is not indicated. What is happening in Zambia: if you are to take a maize seed lot – 40 tonnes – and then maybe one company wants to export maybe 10 tonnes out of the 40, the first sublot will be issued quite OK, but by the time the fifth sublot is issued, it may take some time, and we are saying: the same results of the original test should be reported on all the sublots, but when I look at the time which will be taken between the first sublot and the fifth one, the results might technically not be the same. So I have that concern that we need to indicate also the time validity.”

Grethe Tarp (Denmark):
“The date of sampling will be on the Certificate for the sublot, and that will be the
same date as for the original OIC, and then it’s up to the contract between the buyer
and the seller how old the result on the Certificate is allowed to be. Because the buyer
can say, well, I want a result that is not more than two months old. And then the
company will have to resample and retest, and issue a new OIC. But if the buyer is
satisfied with the result that is one year old, then it is OK that an OIC for a sublot is
issued. You can see on the Certificate how old the sample was when it was sampled
and tested.”

Jane Taylor (United Kingdom):
“I had some concerns about the original OIC being sampled and then the following
year they’ll have some in the warehouse and decide that they want it.”

Grethe Tarp (Denmark):
“Who will accept a Certificate with a result that is more than one year old?”

Jane Taylor (United Kingdom):
“I don’t anticipate many companies in the UK will want to make use of this, but we
have had cases where we have issued one original and four duplicates, because the
customer that’s being exported to does not want all of the consignment, they want it in
two-monthly intervals, so they are happy to accept a duplicate. But I think each
individual laboratory will need some very good traceability to keep track of sublots if
they’re not going to be identified by sequential label numbers on the bags.”

Joël Léchappé (ISTA President):
“I propose that we stop the discussion now. It is clear that more work needs to be done
to make a proposal for next year, and all your comments and questions will be in the
minutes of this Meeting, but in addition to that you are welcome to send questions or
proposals by e-mail, and we would also like to invite you if you want to contribute to
the proposals, you are welcome to join the ECOM working group, so you can just
raise your hand right now or contact Grethe later on.

“I would like to thank very much Grethe and her colleagues who have prepared this
proposal, which is not an easy proposal to prepare.”

Francisco Krzyzanowski (Officer):
“The next topic on the agenda is the Executive Committee response to the Ordinary
Meeting decision to review the audit process (motion from Australia and New
Zealand). I would like to invite Rita Zecchinelli to present it.”

Rita Zecchinelli (Italy):
“For the Ordinary Meeting 2010, the Designated Authorities of Australia and New
Zealand made a motion regarding the current ISTA accreditation system. This motion
has been adopted by the ISTA Voting Delegates voting on behalf of their
governments.

This motion contains four points. The first one asks to the Executive Committee to
review the audit process in order to improve its cost-effectiveness without reducing
standards. The second one asks the ECOM to provide to the Membership a detailed
and accurate set of accounts of the audit programme. The third one asks to reset the
audit fee based on the review, and the fourth asks to submit to the Ordinary Meeting,
to the Membership, the revised audit fee for approval.

“I would like to show which in our opinion are the requirements that must be fulfilled
by ISTA as an accreditation body. The answer to this question can be found in the ISO
17000 series describing the conformity assessment to be intended for the
demonstration that specific requirements relating to a product, a process, a system, a
person or a body are fulfilled. The ISO 17000 standard gives definitions specifically
related to certification and laboratory accreditation. It defines conformity assessment
bodies. The task of a conformity assessment body is to assess conformity of products,
services suppliers to specifications and requirements. Based on this definition we can
say that our seed testing laboratories are conformity assessment bodies and the ISTA
is the accreditation body.
“Having agreed on that, there are two standards of the ISO 17000 series that are of major importance. These are the ISO 17011, giving general requirements for accreditation bodies accrediting conformity assessment bodies, and ISO 17025, giving general requirements for the competence of testing and calibration laboratories.

“Therefore, to look at ISTA as an accreditation body we have to look to the ISO standard 17011. This standard first gives some general requirements, and some of these general requirements are related to the legal status, the structure and the organization of the accreditation body. We will look at this requirement. So the authority of an accreditation body is generally derived from the governments. In the ISTA accreditation system, ISTA is the authority, and the Executive Committee is the Designated Member voted by the Membership on behalf of the governments.

“The accreditation body should be organized and operated so as to safeguard the objectivity and impartiality of its activities. Within ISTA, accreditation is managed by the ISTA Accreditation Department, installed after an Executive Committee decision. All accreditation body personnel, and committees that could influence the accreditation process shall act objectively, and shall be free from any undue commercial, financial and other pressures that could compromise impartiality.

“So, within ISTA, this is achieved, having the decision taken by the Executive Committee, and implementing codes of ethics.

“The accreditation body shall identify the top management having overall authority and responsibility for each of the following: development of policies relating to the operation of the accreditation body; supervision of the implementation of the policies and procedures; supervision of the finances of the accreditation body; decisions on accreditation; contractual arrangements; delegation of authority to committee or individuals as required; undertake the fine activity on behalf of top management. Within ISTA, the top management is represented by the Executive Committee.

“Other requirements that we can find in the 17011 standard regard the accreditation process. The accreditation body shall formally appoint an assessment team, consisting of a lead assessor, and where required, a suitable number of assessors and experts for each specific scope. Using only one auditor is not recommended unless the scope is very limited, and usually one system auditor and one technical auditor are appointed per audit. The auditors shall be trained, qualified and independent.

“Let’s look at the audits. The interval between on-site assessments, whether reassessment or surveillance, depends on the proven stability that the services of the laboratory, the conformity assessment body, has reached. The accreditation shall rely on either reassessment alone or a combination of reassessment and surveillance. If based on reassessment alone, then the reassessment shall take place at intervals not exceeding two years. If the combination of reassessment and surveillance is relied upon, then the accreditation body shall undertake reassessment at least every five years. However, the interval between the surveillance on-site assessment should not exceed two years. Surveillance includes both on-site assessment and other surveillance activities.

“Now we can look how is the ISTA system today. The ISTA accreditation body is offering accreditation on the international level. ISTA accreditation adds value to ISTA Membership, and assures the quality and confidence in ISTA main products, the ISTA Certificates. In order to reduce the costs for the accredited laboratories, within the ISTA system, the technical auditors are coming whenever possible from the region, to reduce the costs, even if they are never coming from the same country to avoid any possible conflicts. Audits are grouped by region, or in a set of more labs, three, even four where possible, to save on travel costs. In any case, economy air travel is used, even if it is a long-distance trip. ISTA Accreditation charges the same travel costs for all the laboratories, independently of the distance of travel. The flat-fee system allows a minimal administration, and with that a minimum of costs for administration.

“Let’s now focus on two aspects that are often taken for possible change in order to reduce costs: the number of the auditors and the interval between two audits. The audit team, if we look to ISO 17011, we see that an assessment team should be
appointed, and if we look to the ISTA audits, there is a maximum of two auditors: the system auditor and the technical auditor. All the three system auditors come from the ISTA Secretariat. This is aimed to assure the same high level of expertise, and to harmonize implementation of the ISTA accreditation system all over the world. The small number of technical auditors, we have 14 technical auditors active today, has to achieve a maximum of harmonization between the laboratories. They have a technical background in seed testing, and usually a working knowledge of at least two languages. In the slide you see a table summarizing where the technical auditors are coming from.

“The interval between audits: ISO 17011 makes some differences whether the accreditation body relies on either reassessment alone or a combination of reassessment and surveillance, but in any case prescribes that the interval between two on-site assessments, or even surveillance visits, does not exceed two years. The ISTA audit cycle is organized with a reassessment visit every third year; it does not include any surveillance visits in between, while surveillance is carried out through proficiency tests only. This cycle could be even questioned by other accreditation bodies.

“How are the prices of ISTA in comparison to other accreditation bodies? In general the fees for ISO accreditation by national accreditation bodies are not easy to estimate. The fees are variable, depending on the number of auditors, the number of days needed for the preassessment activities, the number of days needed for the audit itself, the number of tests included in the scope, travel and accommodation costs, and usually they are different between the first audit and the re-accreditation audits. In contrast, the fees for ISTA accreditation are completely clear; the same fees are charged to all the laboratories for all the audits, they don’t depend on the location of the laboratory or the days needed for the preparation of the audit or the audit itself.

“So, we have done an estimation for the cost of accreditation (you can see a summary on the slide). In Europe, and it considers minimum conditions and standard, normal conditions. Minimum conditions are estimated for laboratories having a very small scope of accreditation and short-distance travel. This estimation shows that the price of ISTA accreditation is around 40–50% of an ISO accreditation in Europe, depending on the laboratory.

“So: where do we stand in the market. ISTA accreditation is today around 50% cheaper than accreditation for the ISO 17025 standard on the European level. This means that the ISTA accreditation system is already very cost-efficient and cost-effective. This is because cost considerations have been already taken into account while setting up the ISTA system. A complete restructuring of the accreditation process needs to have more detailed analysis and cost calculation and would require more time. We will soon come back on this. No further cost optimization can be done in an easy way if we don’t want to reduce standards, and moreover we have to take into account that cost increases on the administration side are a most likely consequence that can arise from that, and we have to look at this aspect too.

“How was the development of the fees within ISTA over the last ten years? In 2009, the Executive Committee decided to increase the audit fee up to CHF 13000, starting from 2010, and to review the fee every third year, according to the inflation rate. Before, ISTA had adjusted its accreditation fee for the last time on January 1, 2001, This means that over a period of nine years, no inflation increase has been covered.

“What is required on 1 January 2011, if CHF 10000 was required ten years ago, taking the inflation rate into consideration: Here you see a table; of course the answer depends on the country, and there are big differences between one country and another, but for many parts of the world it would be more than CHF 13000.

“Financial considerations: the second part of the motion asked the Executive Committee to provide an accurate set of accounts for the auditing programme. The third part of the motion states that after the audit review, the audit fee should be reset in a transparent manner, to reflect the true cost of a performance-based audit process. I will discuss these two parts of the motion together, as they are strictly linked. An accurate and detailed set of accounts for the auditing programme is not available today, and financial details cannot be given with the precision we would like, but we
think that in future it will be possible. The motion presented by the Designated Authorities of Australia and New Zealand is one of the reasons that bring the Executive Committee to start a more general review of the activities carried out by the ISTA Secretariat; another very important reason is the need to address workload problems, and you have been informed by our President about the management and organization review of the work at the Secretariat, commissioned by the Executive Committee, and you will have some more details on this from the Report of the Secretary General.

[01:26:00]

“The review makes clear that although each department has its own work and tasks, often the staff assist with the work of the other departments. This is nothing new for any small organization, and it has been a feature of the Secretariat since the beginning. Until now, the use of staff resources has not been recorded, and this is the reason why reliable cost outputs are not available today. The staff of the Secretariat is now completing time sheets, in order to charge the staff resource use to the specific output function. This will allow a more accurate financial accounting system.

“ISTA has become a more and more professional organization, highly appreciated for the technical works in many fields, the scientific contributions and the accreditation system implemented. The ECOM wants to go further on this way and the new accounting system and reorganization are parts of this process. In particular for the Accreditation Department, this will need at least three years, in order to establish a reliable system, based on the three-year cycle of ISTA accreditation.

“Decisions on the financial policies need to be taken too. Focusing on accreditation, this means to decide what should be paid with the audit fee, what should be paid with the annual accreditation fee? What should be paid with other income?

“We have direct costs, such as the salaries of the auditors, and it is not difficult to charge these costs to the accreditation system. But we have also a lot of indirect costs, such as the costs related to the proficiency test administration and organization, where the participation is not restricted to the accredited labs, and here charging is more difficult. The same can be said for the back office costs. Having these new time sheets completed by the staff, the ECOM will be able to have the figures recorded year by year in the next years before a set of accounts after three years could be available.

“The motion from New Zealand and Australia also states that all future proposals to amend the audit fee should be presented to the Ordinary Meeting of the Association for approval. If we go back to ISO 17011, which gives the requirements for the accreditation bodies, we see that all accreditation body personnel and committees that could influence the accreditation process shall act objectively and shall be free from any undue commercial, financial and other pressure that could compromise impartiality. For this very important reason, the ECOM is not in favour to change the decision that gives to the ECOM itself the task to fix the accreditation fees, differently from the membership fees approved by the Membership, the Ordinary Meeting. This is again a position aimed to strengthen the reliability and quality of the ISTA accreditation system.

“I thank you for your attention.”

The President asked for questions and comments.

Craig McGill (New Zealand):

“Craig McGill, speaking as the Voting Member for New Zealand: as a result of the passing of the motion in Cologne in 2010, part of that motion required that any change in the audit fees be sent to the Membership for voting. That is the current situation. You have already indicated that the ECOM would not want that to proceed for the reasons you have outlined. In your address you didn’t address the issue of the current situation where the fees have to come to the Membership for voting, and also in Cologne, the constitutional change was identified as being necessary to allow that to happen, and that does not appear to have been addressed in your information either, in regard to the constitutional change required.
“The first question is that the notice of motion specified and was approved by the Membership that for all future changes to the audit fees, that would come back to the Membership for a vote, for approval. The presentation indicated that the ECOM would prefer that that remained within the ECOM.”

Rita Zecchinelli (Italy):

“What I said in my presentation is that the Executive Committee is not in favour of this, for the reason that had been shown. If we look at the 17011 standard, we see that accreditation bodies shall identify the top management having overall authority on many things, among them supervision of finances. So, in our opinion, looking at the ISO standard, it is clear that this decision should remain within the Executive Committee’s tasks.”

Craig McGill (New Zealand):

“Nonetheless, the current situation, as a result of the approval of the notice of motion in Cologne, is that all decisions in regard to the audit fees, the changes to the audit fees, need to come back to the Membership at the Ordinary Meeting.”

Steve Jones (Canada):

“Just to try and explain what I think Craig’s statement for us is that the motion from last year from Cologne means that we have to have another motion put forward for voting within the constitution to reverse what was happening there, and so I think we need to create a constitutional change, with recommendation from the ECOM, for next year, so that we can make sure that those things are currently there, arising from the Cologne motion, are dealt with. Is that correct, Craig?”

Craig McGill (New Zealand):

“Yes, that’s correct.”

Charlotte Leonhard (Austria):

“There were from your technical auditors, you had 14 listed there, 13 come from Europe, and you said that this has an influence on the costs, also the travel costs, obviously. Do you plan to attract more technical auditors from other regions of the world? What are you doing there? Are you proactive?”

Rasha El-Khadem (ISTA Accreditation Department):

“At the moment I must say I’m quite new in the Accreditation Department; I was quite busy to get things handed over, and to learn how to run the Accreditation Department. In the last 1½ years we did not start attracting other technical auditors. One concern is actually that the bigger the technical team is, the more difficult it is to get harmonization, and to fulfil requirements such as participation at the Auditors’ Meeting and communication among auditors. We have some applications, also from non-European countries, which we will take into consideration, but we don’t want to make the technical auditors’ team very large. So, yes, we are intending to include other non-European technical auditors, but not to an extent to have, maybe, 25–30 auditors. And there are auditors that will probably resign, so we try to fill these positions with suitable auditors from other countries.”

Michael Muschick (Secretary General):

“I want also to give some feedback from my side: we indeed try to search for appropriate technical auditors from all over the world. We have made special efforts to have a look in the Asian region, and also in the African region. As soon as we find people there who are first of all willing to accept the conditions of being an auditor, and demonstrate to us the necessary education and level of expertise they are having, we are very much willing to include them into the auditor teams. However, to underline what Rasha has said, I think that one of the strengths and values of the ISTA accreditation system is that we have this small auditor team, and we do not want to extend it very largely; that means that maybe some very good technical auditors from Europe have to leave the audit team by including technical auditors from other regions.”
regions. But we are definitely trying to search and trying to identify appropriate persons from Africa and also from Asia.”

Joseph Ahenda (Kenya):

“My contribution to this would be that it’s that you’re looking out to other regions to get the auditors, because as ISTA spreads, the need for different auditors in different regions will be important, because if I make a comparison with other systems of audit, one of the labs that we have in Kenya that does chemical analysis is accredited to UKAS, and the auditors come from South Africa. And if you compare the cost of the two audits, the seed lab and the chemical laboratory, the costs are very different. The ISTA audit is much more expensive than the other lab. And I think, if you could have a system where you can have regional auditors, that will help us in terms of reducing the cost. And then another observation that I want to make is that we would like to know the qualifications that are needed for one to become auditor, because once they’re listed, then we will be able to know what is required of the auditors, then we will be able to know how to prepare our people to become auditors in the region.”

Michael Muschick (Secretary General):

“Thank you, Joseph, for these comments; as I just mentioned, we are trying to identify auditors from the region; on the other side, to be fair, and you mentioned UKAS, you also have to be aware that within the UKAS system you get two bills: one for the auditing, and one for the travel costs. And the travel costs in the ISTA system are included in the overall fee. So it is not very easy to separate it and compare the costs of an ISO body, because they have a lot of variation in what kind of fees they charge, and the simple system in ISTA with an overall flat rate including travel costs and everything else.”

Rita Zecchinelli (Italy):

“If I can add something: I told before during the presentation: it is not always easy to have access to information on the costs of accreditation under ISO, so if you can provide some information to the Executive Committee, that could be good for us.”

Joost van der Burg (Netherlands):

“We spoke as auditors a few days ago, and we realized that next year will be a very busy year, with a lot of audits coming up, and this is due to the original start-up of the accreditation system, where a lot of countries came, so we still have this wave coming every third year. Do you have plans to (because that is also a burden on the Accreditation Department) flatten the workload over the various years, like for instance not visiting labs which have already been visited for a third or a fourth time and no substantial non-conformities in the last audit visit, they could perhaps have an occasional exemption (or a fixed exemption, I’m not sure) of one more year, so that they can be transferred to one year further on, and have a more flat workload. And this also applies to the technical auditors, of course.”

Joël Léchappé (President):

“Thank you for this suggestion, Joost, and we will take it into account, that’s an idea, thank you very much.”

Eduard Goldschagg (South Africa):

“This is just a general comment regarding your table on the inflation rates in the various countries. I don’t see that has any relevance on the pricing, but if you take into account the inflation rate, you must also take into account the exchange rate. That is even more important. Thank you.”

Susan Maxon (United States):

“It would be interesting to know if the study would include the possibility of recognizing other accreditation systems, such as for a laboratory that already had accreditation for instance from ISO 17025 standard, then ISTA could accept the portions of that that were the same and simply audit the additional requirements to meet the ISTA standard, and this could be a possibility for savings in terms of resources on the part of ISTA and on the part of the laboratory. Thank you.”
Joël Léchappé (President):

“Recognition of other accreditation bodies is a good idea, but it has to be reciprocal recognition, and at the moment, that’s on the other side that we have difficulties to have recognition. So this is welcome, but it has to be looked at on both sides.

“If you don’t have more comments or questions at the moment, I propose to thank very much Rita and the Secretariat and the Executive Committee for the work they have done on this.”

The Meeting then adjourned for lunch.

[Dr-100_204.mp3 00:00:30]

6. Report of the Secretary General

The President called upon the Secretary General, Dr. Michael Muschick, to present his Report. The Report had been published by the Secretariat on pages 9–13, 18–32 and 34–41 of the document ‘OM11-03 Activity Report of the ISTA Committees 2010’. As required by the Constitution, the document had been distributed to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organisations for information two months prior to the ISTA Ordinary Meeting, and was available on the ISTA website as of March 2011.

The presentation covered the following topics:

- development of the Association in 2010;
- international collaboration and representation (including the World Seed Project);
- workload analysis of the ISTA Secretariat;
- developments in ISTA Services (handbook, training etc.);
- financial report of accounts for 2010.

All these points are subject to approval by the Membership.

Before presenting the final section, the Financial Report, the Secretary General asked for approval of the preceding sections by applause, which was granted.

The Financial Report: 2010 was a very positive year for ISTA, owing to a good increase in the Membership, which led to an unexpected profit of CHF 28 000.

The Secretary General asked for questions regarding the accounts. Since there were no questions, he asked the President to ask the Meeting for approval of the accounts for 2010, and with that the discharge of the Executive Committee.

The President thanked the Secretary General for his detailed presentation, and asked for approval of the Financial Report by applause, which was granted.

[Dr-100_204.mp3 00:30:00]

7. Constitution changes

The President drew attention to the document OM11-07 Constitution Change Proposals, prepared by Steve Jones and Alison Powell, and asked Alison Powell to present and explain the proposals.

Proposal 1

This proposal is to clarify the procedures to be followed when a serving ISTA President resigns during their term of Presidency.
Valerie Cockerell (United Kingdom):
“In the scenario that we have seen recently: what would happen if the country who is
sponsoring the Vice-President wouldn’t agree to that extended level of service?”

Steve Jones (Canada):
“It’s not really an extended service period, because when the country agrees for the
person to serve as Vice-President, they automatically go to then be President, so
whenever the country’s agreeing for somebody to be a candidate for Vice-President,
they’re agreeing to a six-year term. It’s just what you call the person and the fact that
the person who goes from being Vice-President to President doesn’t have to exit after
three years, when they would have expected to be serving in the Executive Committee
for six years.”

Valerie Cockerell (United Kingdom):
“I guess I’m making the assumption that the level of work or the commitment that’s
required from the President is potentially a little bit more then the Vice-President.”

Steve Jones (Canada):
“That may be the case, but obviously there would have to be some discussion with the
country, and the individual and the Executive Committee. But this proposal is really
about making sure that somebody who was going to serve the Association for a six-
year period doesn’t have to exit sooner.”

Joseph Ahenda (Kenya):
“Will the President now serve the two positions of Presidency and Vice-Presidency?”

Alison Powell (United Kingdom):
“No, the Vice-President has taken over as President, you then have an empty position;
in the present situation, what we have done is, one of the members of the Executive
Committee has taken on to serve as an Officer of the Association, not as Vice-
President, to provide assistance to the President. So we can cover the situation; we
don’t actually have a Vice-President, because we haven’t elected one, we have to wait
till the next Congress to elect the Vice-President for the second period.”

Joseph Ahenda (Kenya):
“That position remains…”

Alison Powell (United Kingdom):
“…empty, yes.”

Joseph Ahenda (Kenya):
“Then another one, just on the sentence: I’m of the opinion that instead of adding that
‘will also serve for the expected period of time of his or her own Presidency’, I think
that we need to just make reference to the Constitution, which stipulates that the Vice-
President shall become the President.”

Alison Powell (United Kingdom):
“Is it not just as clear just to state it there rather than refer to
another part of the
Constitution? It’s very clear there what the actual position is, rather than have to say
‘you’ve read so far, now go to another part of the Constitution’.”

Danielle Ruckert (Luxembourg):
“I don’t have a concern with the text as it’s written there, but I have the question:
What will happen when the President won’t continue? Is something foreseen in the
Constitution? It can happen, it’s for a long period…”

Joël Léchappé (President):
“It depends on if it’s before or after 2013. In 2013 we have the Congress, and we will
have a new Vice-President. Then this would fully apply if I can’t continue. And if we
don’t vote on this one today, and if I do not continue in 2014, we would be in the
same difficult position as today. This would solve the question after 2013. Before 2013, we have to refer to the Constitution, and probably an extraordinary Meeting for voting for Officers would be necessary.”

As there were no more comments, the President proposed to move on to the vote, and reminded the Meeting that a two-thirds majority was necessary.

The votes cast were 41 for, 0 against. The proposal was thus passed.

Proposal 2
This change was proposed to make it clear what procedure would be followed if an ISTA Ordinary Meeting where elections are held was not quorate.

Joseph Ahenda (Kenya):
“I would like a time frame to be put in which a correspondence vote would be held.”

Michael Muschick (Secretary General):
“I think we have difficulties to make modifications to Constitution changes on the spot. The proposal to make changes and the idea to define a time line I think is a good proposal from Kenya. If you feel that this should be put into this change of the Constitution, you have to reject the proposal as it stands, and we have to vote on it next year with a modified version defining a certain time period.”

Susan Maxon (United States):
“I have a question about who actually does the appointing of the new Vice-President and the new Executive Committee? Is this an election? It says ‘appointed’.”

Steve Jones (Canada):
“The way this was phrased was to reflect what goes on at the moment, so if you have a Meeting where you actually vote on who’s going to be on the Executive or who’s going to be Vice-President it’s the Voting Members, so, the countries with the vote that would vote, and then those people are elected onto the … they are appointed onto the Executive by the Membership. That’s why it was phrased like that. Going back to Michael’s point about if people didn’t want to accept this motion, there’s always the option to … for Joseph to put in an amendment in consultation with people for another year if you think there’s room to improve these ones, but it’s not easy to modify these as we’re going along. So if people think it’s worth including it as it is and then modifying it by improving it in subsequent years, that would be the thing to do, rather than just reject it out of hand.”

There being no more questions or comments, the proposal was put to the vote.

The majority of votes for the proposal being greater than two thirds, the proposal was thereby accepted.

Proposal 3
This proposal was to make it clear what procedure would be followed if an ISTA Ordinary Meeting was not quorate.

There being no questions or comments, the proposal was put to the vote.

The majority of votes for the proposal being greater than two thirds (38 to 0), the proposal was thereby accepted.

Proposal 4
This proposal is to allow membership approval of the minutes of the Ordinary Meeting earlier than the next Meeting.

Susan Maxon (United States):
“I fully appreciate the need to have the minutes approved so that the business of the Association can proceed on the basis of the decisions that would be made at the given Annual Meeting, but I’m concerned that the acceptance of the minutes as it’s written here would be based more on the absence of comments, rather than on a positive indication that the Membership has ratified the minutes. I think it would be more in line with the way ISTA has operated to have the minutes approved by correspondence in that period of time, rather than simply as the absence of comments.”

Joost van der Burg (Netherlands):

“Although I agree with Susan about her comments, I think it will be very difficult to get positive replies sufficiently by mail and correspondence, or through the web site, to get enough positive replies to make this decision and to accept these minutes, so I stay in favour of the present proposal.”

Susan Maxon (United States):

“I can appreciate maybe that the minutes might not be considered as urgent to the Membership to respond by correspondence, but we have just agreed to two changes to the Constitution that will be possibilities of by correspondence, and so this would be the same problem.”

Alison Powell (United Kingdom):

“I think there’s a difference between what we have already agreed, and what is written here; the two previous proposal that have been accepted were a clear correspondence vote; this I don’t think does say a correspondence vote, it waits for comments, and then the comments would be incorporated. It’s not asking for a vote. That is the difference.”

There being no questions or comments, the proposal was put to the vote.

The majority of votes for the proposal being greater than two thirds (38 to 3), the proposal was thereby accepted.

[DR-100_204.mp3 01:01:30]

8. Fixation of Annual Subscriptions

The President referred to document OM11-04 Proposal for the Membership Fees 2012, and asked the Secretary General to present the Proposal.

The Secretary General referred to the ECOM decision, in connection with the workload analysis of the ISTA Secretariat, to increase the Secretariat staff by 1.8 full-time equivalent positions. This investment could not be met by an increase in membership alone.

The Secretary General asked for comments.

Yong Too Jeon (Republic of Korea):

“I suggest that the annual membership fee is to be frozen, because of the global financial crisis and the difficult economic conditions. Thank you.”

There being no further comments, the President asked for a vote on the proposal.

The proposal was accepted with 34 votes to 5.

[DR-100_204.mp3 01:08:00]

9. Consideration and adoption of the proposed Rules Changes

The President referred to the document OM11-05 Proposed Changes to the ISTA International Rules for Seed Testing 2012 Edition, and invited the Chair of the Rules
Committee, Steve Jones, to the stage. The Rules Committee Chair would also ask for
the votes to facilitate the process.

The Rules Committee Chair explained that detailed discussions had taken place at the
Rules Committee presentation on 15 June, and that there were some amendments to
the document that had been distributed prior to the Meeting.

The first section of the proposed changes to the Rules, Part A, dealt with the editorial
changes. As there were no additions and no questions with regard to these, the Rules
Committee Chair asked for them to be accepted by applause, which was granted.

For Parts B and C the Rules Committee Chair went through the Rules change
proposals one by one. The results of the voting are given on the following pages.
Part A. Introduction of editorial changes

A.1. Editorial corrections

<table>
<thead>
<tr>
<th>Current version</th>
<th>Proposed version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.5.2.2</strong></td>
<td><strong>3.5.2.2</strong></td>
</tr>
<tr>
<td>Sterile florets</td>
<td>Sterile florets</td>
</tr>
<tr>
<td>In the following genera a sterile floret attached to a fertile floret is not removed, but left attached and included in the pure seed fraction: <em>Arrhenatherum</em>, <em>Avena</em>, <em>Bromus</em>, <em>Chloris</em>, <em>Dactylis</em>, <em>Festuca</em>, <em>×Festulolium</em>, <em>Holcus</em>, <em>Koeleria</em>, <em>Lolium</em>, <em>Poa</em>, <em>Sorghum</em> and <em>Triticum spelta</em>.</td>
<td>In the following genera a sterile floret attached to a fertile floret is not removed, but left attached and included in the pure seed fraction: <em>Arrhenatherum</em>, <em>Avena</em>, <em>Bromus</em>, <em>Chloris</em>, <em>Dactylis</em>, <em>Festuca</em>, <em>×Festulolium</em>, <em>Holcus</em>, <em>Koeleria</em>, <em>Lolium</em>, <em>Poa</em>, <em>Sorghum</em>, <em>Triticum dicoccon</em> and <em>Triticum spelta</em>.</td>
</tr>
</tbody>
</table>

**Editorial changes to Germination Chapter 5**

Because of retests, some pairs or trios of tests are in fact already out of tolerances and there is no need to check them again in the further steps of the tolerance checking procedure.

<table>
<thead>
<tr>
<th>Current version</th>
<th>Proposed version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5.8.1 Tolerances</strong></td>
<td><strong>5.8.1 Tolerances</strong></td>
</tr>
<tr>
<td>§3 … If the three test results are not in tolerance (i.e. the difference between the three test results exceeds the tolerance indicated in Table 5D), the highest compatible result obtained from comparison of the <em>three</em> test pairs of the <em>two</em> tests is reported (i.e. comparison of tests 1 and 3 and tests 2 and 3, tests 1 and 2 having already been found to be out of tolerance). …</td>
<td>§3 … If the three test results are not in tolerance (i.e. the difference between the three test results exceeds the tolerance indicated in Table 5D), the highest compatible result obtained from comparison of the <em>two</em> test pairs of the <em>three</em> tests is reported (i.e. comparison of tests 1 and 3 and tests 2 and 3, tests 1 and 2 having already been found to be out of tolerance). …</td>
</tr>
</tbody>
</table>
§4 If the four test results are not in tolerance (i.e. the difference between the four test results exceeds the tolerance indicated in Table 5E), the highest compatible result obtained from comparison of the three test trios of the four tests is reported (i.e. comparison of tests 1, 2 and 3; tests 1, 2 and 4; and tests 2, 3 and 4). If after carrying out the comparison of trios of tests no compatible result is obtained, the highest compatible result obtained from comparison of the six pairs of the four tests is reported (i.e. comparison of tests 1 and 2; tests 1 and 3; tests 1 and 4; tests 2 and 3; tests 2 and 4; and tests 3 and 4). If after carrying out the comparison of six pairs of tests no compatible result is obtained, no test result is reported, and the customer is informed that the sample appears to have unacceptable variation in germination.

Figure 5.2. Flow chart…
Centre, diamond 4:
Any pair of test results within tolerance (Table 5D)?

Figure 5.2. (cont.) Flow chart…
Left, diamond 3:
Any of 6 pairs of test results within tolerance (Table 5E)?

It is suggested that tables 5C to 5E could be also used for the category of fresh seeds.

5.11 Tolerance tables
§5 Tables 5C–5E give the tolerances for percentages of normal seedlings, abnormal seedlings, dead seeds, hard seeds, or any combination of these…

Harmonization of titles 5.6.2.1.1. and 5.6.2.1.2.

5.6.2.1.1. Paper substrates
Editorial change to 6.5.2.1.2 for consistency in the Rules

6.5.2.1.2 Soaking in water
… If the percentage of hard seeds of the Fabaceae (Leguminosae) is to be determined for the purpose of issuing an ISTA International Seed Analysis Certificate, the seed should be soaked in water at 20 ºC for 22 hours. Other procedures may lead to excessive variability in results.

6.5.2.1.2 Soaking in water
… If the percentage of hard seeds of the Fabaceae is to be determined for the purpose of issuing an ISTA Certificate, the seed should be soaked in water at 20 ºC for 22 hours. Other procedures may lead to excessive variability in results.
<table>
<thead>
<tr>
<th>Missing reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seed Health Method 7-009</strong></td>
</tr>
<tr>
<td>Add missing reference details:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wrong information delete</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Seed Health Method 7-022-6</strong></td>
</tr>
<tr>
<td>Streptomycin sulphate Streptomycin sulphate can be dissolved in 70% ethanol or water. Filter……</td>
</tr>
<tr>
<td>Streptomycin sulphate Streptomycin sulphate can be dissolved in 70% ethanol or water. Filter……</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spelling correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.8.3.1 Principle</td>
</tr>
<tr>
<td>The ............ (electrophoregram) .....</td>
</tr>
<tr>
<td>The ............ (electrophoregram) .....</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delete unnecessary sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.8.5.1 and 8.8.7.1</strong></td>
</tr>
<tr>
<td>……</td>
</tr>
<tr>
<td>Ultrathin gels are very economical. They can also be run at higher voltage with shorter running times and stain more quickly than conventional gels.</td>
</tr>
<tr>
<td><strong>8.8.5.1 and 8.8.7.1</strong></td>
</tr>
<tr>
<td>……</td>
</tr>
<tr>
<td>Ultrathin gels are very economical. They can also be run at higher voltage with shorter running times and stain more quickly than conventional gels.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delete reference to ploidy testing as no longer covered in the Rules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.5.3</strong></td>
</tr>
<tr>
<td>For a determination of ploidy level tissue is excised and processed for analysis.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correction of wrong cross references</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>8.5.3</strong></td>
</tr>
<tr>
<td>………listed under 8.8.1…</td>
</tr>
<tr>
<td>………listed under 8.8.4 …</td>
</tr>
<tr>
<td><strong>8.5.5</strong></td>
</tr>
<tr>
<td>………listed under 8.8.2…</td>
</tr>
<tr>
<td>………listed under 8.8.2-10 …</td>
</tr>
<tr>
<td><strong>5.2.10</strong></td>
</tr>
<tr>
<td>………in 5.2.7.4.</td>
</tr>
<tr>
<td>5.2.10</td>
</tr>
<tr>
<td>………in 5.2.107.4.</td>
</tr>
<tr>
<td><strong>17.3</strong></td>
</tr>
<tr>
<td>…….Certificates are not significantly different from each other as determined by the tolerance tables included at the end of this appendix.</td>
</tr>
<tr>
<td><strong>17.3</strong></td>
</tr>
<tr>
<td>…….Certificates are not significantly different from each other as determined by the tolerance tables included at 17.8.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spelling corrections:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Column 3 header to Tables 2B part 1 and 2 on page 2-41</td>
</tr>
<tr>
<td>Minimum working samples Minimum working sample</td>
</tr>
<tr>
<td>Page 2-5 c) spacing correction</td>
</tr>
<tr>
<td>The sampling stick consists of an</td>
</tr>
<tr>
<td>The sampling stick consists of an</td>
</tr>
<tr>
<td>Page 5-32 spelling correction</td>
</tr>
<tr>
<td>Allium schoenoprasum</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Page 5-35 spelling correction</td>
</tr>
<tr>
<td><em>Cenchrus setiger</em>&lt;sup&gt;his&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page 2-2.2.11 use of;</th>
<th>d) an energy form including heat, radiation, electricity or magnetism, but does not specify the application method.</th>
</tr>
</thead>
<tbody>
<tr>
<td>d) an energy form including heat, radiation, electricity or magnetism, but does not specify the application method.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page 3-7 reformatting</th>
<th>2. Classify the following <em>Poa pratensis</em>, <em>Poa trivialis</em> or <em>Dactylis glomerata</em> florets and caryopses as inert matter:</th>
</tr>
</thead>
</table>
| 2. Classify the following *Poa pratensis*, *Poa trivialis* or *Dactylis glomerata* florets and caryopses as inert matter: | 1. Florets with ergot exserted from the tip of the floret  
2. Broken florets and caryopses, half or less than half the original size  
3. Other seeds (including other *Poa* spp.), sticks, stems, sand etc. must be classified in accordance with 3.2.2 and 3.2.3. |

<table>
<thead>
<tr>
<th>Accepted by applause</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>accepted</td>
<td></td>
</tr>
</tbody>
</table>
The Seed Health Committee asked for an emergency addition to ISTA Seed Health Method 7-021. The following text was to be added to the method and to the web page contain the downloadable seed health methods:

“IMPORTANT NOTICE
The pathogenicity test for this method is under review due to the occurrence of false positive results. Please see the ISTA website for more details.”

This addition required a motion to allow it before voting. This was made, and the addition was accepted.

Part B. New species and changes of species names

B.1. Addition of *Prunus persica* to Table 2A. Part 2

It is proposed that *Prunus persica* is added to Table 2A. Part 2 as this species is already listed in both the Tetrazolium and Excised Embryo Testing Chapters but until it is listed in Table 2A tests results can not be issued on an ISTA Certificate. To correct this anomaly the members of the Forest Tree and Shrub Committee have provided the following seed lot, submitted sample and working sample sizes. The following proposal was developed by the Forest Tree and Shrub Committee and approved by a vote.

Addition to Table 2A. Part 2

<table>
<thead>
<tr>
<th>Species</th>
<th>Maximum weight of lot (kg)</th>
<th>Minimum submitted sample (g)</th>
<th>Minimum working sample for purity analysis (3.5.1) (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Prunus persica</em> (L.) Batsch</td>
<td>5,000</td>
<td>500 seed</td>
<td>500 seed</td>
</tr>
</tbody>
</table>

Vote to accept item

<table>
<thead>
<tr>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>

No changes to species names for the 2012 Edition of the Rules.
Part C. Rules changes and new methods requiring a vote

Chapter 1: Certificates

C.1.1 Addition of text and correction to text for 1.5.2.6 Reporting for the Germination test

This proposal is in two parts: 1) addition of text for the reporting of fresh seeds and 2) a correction to the text for reporting.

The addition of text is not really a change to existing procedures but it was not clearly stated as a requirement in the sections for reporting germination results therefore although it could be considered as an editorial only change it is being presented for a vote to be transparent to the membership. There has always been the requirement to test fresh seeds when 5% or more fresh seeds are believed to be present see 5.6.5.3. It was not clear that the method used to classify seed as fresh needed to be stated on the certificate; this proposal makes it clear what must be reported on the certificate.

Proposed by the Germination Committee.

Note: if this proposal is accepted the reporting in the Germination Chapter at 5.9 must also be approved to reflect these changes see C.5.2.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>The method of determining fresh seeds is not reported (new point 4).</td>
<td>1.5.2.6 Germination</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>The following additional information must also be reported under ‘Other determinations’:</td>
<td>The following additional information must also be reported under ‘Other determinations’:</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>– The method for evaluating fresh seeds (dissection, tetrazolium or excised embryo –see paragraph 5.6.5.3.) when 5% or more of fresh seeds are believed to be present.</td>
<td></td>
</tr>
</tbody>
</table>

Current point 4 reformatted to a separate paragraph.

When double tests are prescribed in Table 5A Part 2, the result of the first test, with treatment for breaking dormancy, is reported in the appropriate space on the ISTA Certificate, and the result of the second test, without treatment for breaking dormancy, is reported under ‘Other determinations’.

When double tests are prescribed in Table 5A Part 2, the result of the first test, with treatment for breaking dormancy, is reported in the appropriate space on the ISTA Certificate, and the result of the second test, without treatment for breaking dormancy, is reported under ‘Other determinations’.
Correction of text that was included in the wrong place and inclusion of text that should not have been removed last year.

<table>
<thead>
<tr>
<th>1.5.2.6 Germination</th>
<th>1.5.2.6 Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>The result of a germination test must be reported in the spaces provided as follows:</td>
<td>The result of a germination test must be reported in the spaces provided as follows:</td>
</tr>
<tr>
<td>– the actual duration of the test (in days, excluding the period of special treatment or method used for promoting germination);</td>
<td>– the actual duration of the test (in days, excluding the period of special treatment or method used for promoting germination);</td>
</tr>
<tr>
<td>– the percentages, calculated to the nearest whole number (5.8.2), of normal seedlings, hard seeds, fresh seeds, abnormal seedlings and dead seeds. If the result for any of these categories is found to be zero, it must be reported as ‘0’;</td>
<td>– the percentages, calculated to the nearest whole number (5.8.2), of normal seedlings, hard seeds, fresh seeds, abnormal seedlings and dead seeds. If the result for any of these categories is found to be zero, it must be reported as ‘0’;</td>
</tr>
<tr>
<td>– the method used;</td>
<td>– the method used;</td>
</tr>
<tr>
<td>– the number of seeds used to calculate the percentages, if less than 400 seeds are tested.</td>
<td>– the number of seeds used to calculate the percentages, if less than 400 seeds are tested.</td>
</tr>
</tbody>
</table>

The following additional information must also be reported under ‘Other determinations’:

– the germination method using the abbreviations used in Table 5A, including at least substrate and temperature;
– any special treatment or method used for promoting germination (5.6.3);
– the duration in days of any special treatment or method used for promoting germination, except in the case of prestorage.
– When double tests are prescribed in Table 5A Part 2, the result of the first test, with treatment for breaking dormancy, is reported in the appropriate space on the ISTA Certificate, and the result of the second test, without treatment for breaking dormancy, is reported under ‘Other determinations’.

- the germination percentage obtained within the prescribed time, if the germination period was extended beyond the period indicated in Table 5A. The statement must be entered as follows: “After the prescribed period of … days, there were … % normal seedlings.”
– When double tests are prescribed in Table 5A Part 2, the result of the first test, with treatment for breaking dormancy, is reported in the appropriate space on the ISTA Certificate, and the result of the second test, without treatment for breaking dormancy, is reported under ‘Other determinations’.
C.1.2 Amendment to the sections 1.4.2 and 1.4.3 for ISTA Certificates

The blank ISTA Orange and Blue Certificates have different text printed on them than sections 1.4.2.1) and 1.4.3.3) of the Rules state. Because there is a stock of the blank ISTA Certificates, and a change to the certificate template to create these blank certificates is not planned soon, it is proposed that the text in the ISTA Rules is amended to match the text as printed on the existing blank Orange and Blue certificates.

In addition the certificates require the use of a laboratory stamp and this is not mentioned in the Rules. Although these changes could be considered editorial it was thought to be important for the members to vote on them.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
</table>
| 1.4.2. Orange International Seed Lot Certificate
   ..... l) the following declaration, signed by the Head of the issuing laboratory, or their assignee: “I certify that sampling, sealing and testing have been carried out in accordance with the ISTA International Rules for Seed Testing by an ISTA accredited laboratory.” | 1.4.2. Orange International Seed Lot Certificate
   ..... l) the following declaration, signed by the Head of the issuing laboratory, or their assignee: “I certify that sampling, sealing and testing have been carried out in accordance with the International Rules for Seed Testing of the ISTA and that the tests have been made at a laboratory accredited by the International Seed Testing Association to issue International Seed Analysis Certificates.” |
| 1.4.3. Blue International Seed Sample Certificate
   ..... g) the following declaration, signed by the Head of the issuing laboratory, or their assignee:
   “I certify that testing has been carried out in accordance with the ISTA International Rules for Seed Testing by an ISTA accredited laboratory.” | 1.4.3. Blue International Seed Sample Certificate
   ..... g) the following declaration, signed by the Head of the issuing laboratory, or their assignee:
   “I certify that testing has been carried out in accordance with the International Rules for Seed Testing of the ISTA and that the tests have been made at a laboratory accredited by the International Seed Testing Association to issue International Seed Analysis Certificates.” |

<table>
<thead>
<tr>
<th>Current version</th>
<th>Proposed version</th>
</tr>
</thead>
</table>
| 1.4.2. Orange International Seed Lot Certificate
   The completed certificate must show the following information: | 1.4.2. Orange International Seed Lot Certificate
   The completed certificate must show the following information: |
<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.1.2</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current version</th>
<th>Proposed version</th>
</tr>
</thead>
<tbody>
<tr>
<td>The completed certificate must show the following information: a) name, address ISTA member code of issuing laboratory;</td>
<td>The completed certificate must show the following information: a) name, address, ISTA member code and stamp (seal) of issuing laboratory;</td>
</tr>
</tbody>
</table>

a) name, address **and** ISTA member code of issuing laboratory;

....
Chapter 2: Sampling

C.2.1. More general description of sampling stick

It is proposed that description of the sampling stick is changed to be more general to include a sampling stick where the sampling stick can be opened or closed by a push/pull motion.

The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5.1.3 Taking primary samples c) Sampling stick (e.g. stick trier; sleeve type trier; spiral trier). The sampling stick consists of an inner tube which fits loosely inside an outer tube but tightly enough so that seed or impurities do not slip between them. The outer tube has a solid pointed end. Both tubes have slots cut into their walls so that the cavity of the inner tube can be opened and closed by twisting the tubes against each other.</td>
<td>2.5.1.3 Taking primary samples c) Sampling stick (e.g. stick trier; sleeve type trier; spiral trier). The sampling stick consists of two parts, one of which fits loosely inside the other, but tightly enough so that seed or impurities do not slip between them. The outer part has a solid pointed end. Both parts have slots in their walls so that the cavity of the inner part can be opened and closed by moving the two parts against each other by either a twisting or a push-pull motion.</td>
</tr>
</tbody>
</table>

Vote to accept item   Yes votes   No votes   Result
C.2.1   |   |   | accepted |

C.2.2. Sampling stick partitions obligatory for diagonal use

It is proposed that sampling sticks with one entire cavity and simultaneous opening of all the slots should only be used horizontally. It has been observed that using such instruments vertically or diagonally downwards seed entering the cavity from the top, will fall down within the cavity and will hinder seed entering further down. Consequently, an excessive amount of seed would be sampled from the upper part of the container.

The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5.1.3 Taking primary samples c) Sampling stick (e.g. stick trier; sleeve type trier; spiral trier). ... However, when used vertically the sampling stick must either have partitions dividing the instrument into a number of compartments or have slots in spiral arrangement. The minimum inside diameter should be about 25 mm for all species.</td>
<td>2.5.1.3 Taking primary samples c) Sampling stick (e.g. stick trier; sleeve type trier; spiral trier). ... However, when used vertically or diagonally downwards, the sampling stick must either have partitions dividing the instrument into a number of compartments or have slots in spiral arrangement. The minimum inside diameter should be about 25 mm for all species.</td>
</tr>
</tbody>
</table>

Vote to accept item   Yes votes   No votes   Result
C.2.2   | 2   |   | accepted |
C.2.3. Hand sampling: deletion of misleading example genera

It is proposed to delete the examples of the genera where hand sampling sometimes gives the most satisfactory results. In some cases it has been unclear whether sampling by hand is allowed for other genera than those listed as examples. The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5.1.3 Taking primary samples</td>
<td>2.5.1.3 Taking primary samples</td>
</tr>
<tr>
<td>f) Sampling by hand. This method is sometimes the most satisfactory method as</td>
<td>f) Sampling by hand. This method can be used for all species and may be the most</td>
</tr>
<tr>
<td>in the following examples:</td>
<td>suitable method for seed that may be damaged by the use of triers, seeds with</td>
</tr>
<tr>
<td>Agropyron, Agrostis, Alopecurus,</td>
<td>wings, seeds with low moisture content, seed tapes and seed mats.</td>
</tr>
<tr>
<td>Anthoxanthum, Arrhenatherum,</td>
<td></td>
</tr>
<tr>
<td>Axonopus, Bromus, Chloris, Cynodon,</td>
<td></td>
</tr>
<tr>
<td>Cynocrus, Dactylis, Deschampsia,</td>
<td></td>
</tr>
<tr>
<td>Digitaria, Elymus, Elytrigia, Festuca,</td>
<td></td>
</tr>
<tr>
<td>Holcus, Lolium, Melinis, Panicum,</td>
<td></td>
</tr>
<tr>
<td>Pascopyrum, Paspalum, Poa, P.</td>
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<tr>
<td>Panaeostachys, Pseudoroegneria,</td>
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</tr>
<tr>
<td>Triticeum, Zoysia.</td>
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</tr>
</tbody>
</table>

Sampling by hand is also the most suitable method for seed that may be damaged by the use of triers, e.g. in seed lots of large seeded legumes, for seeds with wings or seeds which have a low moisture content or for seed tapes and seed mats.

Andrea Jonitz (Germany):
“Oily seeds are also very sensitive to be damaged by triers. Maybe we could add it also?”

Steve Jones:
“I’d be inclined not to make the amendment; these are just some examples.”

Leena Pietilä (BSC):
“I think it’s OK to amend it, but on the other hand, there are still many different situations that are missing, and it’s difficult if we have to include all the possible examples.”

There was no motion for an amendment.

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
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<th>Result</th>
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<tbody>
<tr>
<td>C.2.3</td>
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<td>accepted</td>
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</tbody>
</table>
C.2.4. Obtaining the composite sample: clarification

A clarification is proposed. The uniformity of the seed lot should be checked by assessing the uniformity of the primary samples, or the composite sample when the primary samples are collected directly into one container.

The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
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<tbody>
<tr>
<td>2.5.1.4. Obtaining the composite sample&lt;br&gt; If the primary samples appear uniform, they can be combined to form the composite sample. If not, the sampling procedure must be stopped. When primary samples are collected directly into one container, the content of this container shall be regarded as the composite sample only if it appears uniform. If not, it must not be used for obtaining a submitted sample.</td>
<td>2.5.1.4. Obtaining the composite sample&lt;br&gt; Where possible the primary samples are compared with each other during sampling. The primary samples can only be combined to form the composite sample if they appear to be uniform. If not, the sampling procedure must be stopped. When primary samples are collected directly into one container, the content of this container shall be regarded as the composite sample only if it appears uniform. If not, it must not be used for obtaining a submitted sample.</td>
</tr>
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<thead>
<tr>
<th>Vote to accept item</th>
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<th>No votes</th>
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<tbody>
<tr>
<td>C.2.4</td>
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<td></td>
<td>accepted</td>
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</tbody>
</table>

C.2.5. Sampler not required to dispatch submitted sample

It is proposed that the seed sampler need not dispatch the submitted samples to the laboratory. The submitted samples must be sealed in such a way that they cannot be tampered with. The requirement of sealing the submitted sample is indicated in 2.5.4.2. Also editorial replacement of ‘shall’ with ‘must’ to be consistent throughout the Rules.

The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
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</thead>
<tbody>
<tr>
<td>2.5.1.6. Dispatch of the submitted sample&lt;br&gt; Submitted samples shall be dispatched by the sampler to the seed testing laboratory without delay.</td>
<td>2.5.1.6. Dispatch of the submitted sample&lt;br&gt; Submitted samples must be dispatched to the seed testing laboratory without delay.</td>
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</table>

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<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
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<th>Result</th>
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<tbody>
<tr>
<td>C.2.5</td>
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<td></td>
<td>accepted</td>
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</tbody>
</table>
C.2.6. Reduction methods for moisture sample

Procedures for obtaining the submitted and working sample for moisture determination are proposed to be separated.

It is proposed that the submitted moisture sample should be taken as fast as possible instead of within 30 seconds. The requirement of a minimum of 30 seconds is not in line with the time normally necessary for drawing a composite and submitted sample. Drawing a sample manually may take several minutes, and using an automatic sampler may take several hours. It is also proposed that special mixing methods are not described.

Please note that the method for obtaining the working sample for moisture determination is hardly changed and the new text is the existing procedure with ‘must’ rather than ‘may’ in the last sentence.

The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
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</thead>
<tbody>
<tr>
<td><strong>2.5.2 Procedure for obtaining the working sample</strong></td>
<td><strong>2.5.2 Procedures for obtaining the submitted and working sample</strong></td>
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<tr>
<td>................</td>
<td>................</td>
</tr>
<tr>
<td><strong>2.5.2.2 Sample reduction methods</strong></td>
<td><strong>2.5.2.2 Sample reduction methods</strong></td>
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<tr>
<td>§5</td>
<td>§5</td>
</tr>
<tr>
<td>Subsamples for moisture content determination <strong>may</strong> be taken in the following way: before taking the subsample, mix the sample by either stirring the sample in its container with a spoon or place the opening of the original container against the opening of a similar container and pour the seed back and forth between the two containers. Take a minimum of three subsamples with a spoon from different positions and combine them to the subsample of the required size. The seed may not be exposed to the air during sample reduction for more than 30 seconds.</td>
<td>To obtain the submitted sample for moisture content determination (2.5.4.4 a) subsamples must be taken in the following way: first, mix the composite sample. Then, take a minimum of three samples from different positions and combine them to create the subsample for moisture of the required size. The subsample for moisture must be taken as soon as possible to avoid changes in moisture content. To obtain the working sample for moisture content determination (9.1.5.2) subsamples must be taken in the following way: before taking the subsample, mix the sample by either stirring the sample in its container with a spoon or place the opening of the original container against the opening of a similar container and pour the seed back and forth between the two containers. Take a minimum of three subsamples with a spoon from different positions and combine them to create the subsample of the required size. The seed must not be exposed to the air during sample reduction for more than 30 seconds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
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<tbody>
<tr>
<td>C.2.6</td>
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</tbody>
</table>
C.2.7. Spoon method for Arachis, Glycine and Phaseolus and Abies, Cedrus and Pseudotsuga

It is proposed that the spoon method be permitted for reducing samples of Arachis, Glycine and Phaseolus and Abies, Cedrus and Pseudotsuga seeds. Large-seeded legumes are fragile, so the gentle spoon method is suggested to be allowed for reduction of samples. Abies, Cedrus and Pseudotsuga seeds are oily. The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
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</thead>
<tbody>
<tr>
<td>2.5.2.2.3 Spoon method</td>
<td>The spoon method is recommended for sample reduction for seed health testing (7.4.1). For other tests it is restricted to species with seeds smaller than Triticum spp. A tray, a spatula and a spoon with a straight edge are required. …</td>
</tr>
<tr>
<td>2.5.2.2.3 Spoon method</td>
<td>The spoon method is recommended for sample reduction for seed health testing (7.4.1). For other tests it is restricted to species with seeds smaller than Triticum spp., to the genera Arachis, Glycine and Phaseolus, and to tree genera Abies, Cedrus and Pseudotsuga. A tray, a spatula and a spoon with a straight edge are required. …</td>
</tr>
</tbody>
</table>

Vote to accept item

<table>
<thead>
<tr>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
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<tbody>
<tr>
<td>C.2.7</td>
<td>accepted</td>
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</tbody>
</table>
C.2.8. Hand halving method for Arachis, Fagus, Glycine, Phaseolus, Pinus cembra and Pinus pinea

It is proposed that samples of *Arachis*, *Glycine* and *Phaseolus*, with easily damaged seeds, especially in dry conditions, can be divided by hand halving. Hand halving should also be allowed for *Fagus* seeds, because of their large size, and for *Pinus cembra* and *Pinus pinea*, because of the resin in their seeds which stains mechanical dividers.

It is also proposed that hand halving could be used when all other halving methods are extremely difficult to apply. According to ISTA’s strategy, the number of subtropical and tropical species in the Rules should be increased, so there may be more species with large seeds, or some other reason why hand halving is the most suitable method. The following proposal was developed by the Bulking and Sampling Committee and approved by a vote.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
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<tbody>
<tr>
<td>2.5.2.2.4. The hand halving method</td>
<td>2.5.2.2.4. The hand halving method</td>
</tr>
<tr>
<td>This method is restricted to the following genera of chaffy seeds: Agrimonia, …;</td>
<td>This method is restricted to the following genera of chaffy seeds: Agrimonia, …;</td>
</tr>
<tr>
<td>and to the following genera of tree and shrub seeds: Acer, Aesculus, Ailanthus, Castanea, Cedrela, Corylus, Fraxinus, Juglans, Liriodendron, Platanus, Populus, Quercus, Salix, Tectona, Ulmus.</td>
<td>to the following genera of easily damaged fragile seeds: <em>Arachis</em>, <em>Glycine</em> and <em>Phaseolus</em>; and to the following genera and species of tree and shrub seeds: <em>Acer</em>, <em>Aesculus</em>, <em>Ailanthus</em>, <em>Castanea</em>, <em>Cedrela</em>, <em>Corylus</em>, <em>Fagus</em>, <em>Fraxinus</em>, <em>Juglans</em>, <em>Liriodendron</em>, <em>Pinus cembra</em>, <em>Pinus pinea</em>, <em>Platanus</em>, <em>Populus</em>, <em>Quercus</em>, <em>Salix</em>, <em>Tectona</em>, <em>Ulmus</em>.</td>
</tr>
<tr>
<td>…</td>
<td>The hand halving method can also be used with the species where all other dividing methods are extremely difficult or impossible to use.</td>
</tr>
</tbody>
</table>

Grace Kaudzu (Malawi):
“I think I talked to the Chair of the Bulking and Sampling Committee about including varieties in here because there are other varieties that are fragile when you are using mechanical methods for reduction, for getting a working sample in the laboratory.”

Leena Pietilä (BSC):
“We propose that these are the example species, and that the hand halving method is allowed for any species where mechanical devices may give some problems. We can’t add all the species here, but on the other we would like to make it clear that this is not the best method to use if you are able to use, for example, riffle dividers. So we would to keep these example species.”

<table>
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<th>Vote to accept item</th>
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<tr>
<td>C.2.8</td>
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<td>accepted</td>
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</tbody>
</table>
Chapter 3: The Purity Analysis

C.3.1. Addition of *Tripleurospermum* and *Althaea* to Table 3B Part 1

Due to nomenclature changes, *Tripleurospermum* and *Althaea* were not assigned to a PSD. PSD 1 is the most suitable for *Tripleurospermum*. PSD 16 is the most suitable for *Althaea*. This proposal is supported by the Purity Committee.

Table 3B Part 1. Pure seed definition numbers and chaffiness of seeds, listed by genus

<table>
<thead>
<tr>
<th>PROPOSED VERSION</th>
<th>Family</th>
<th>PSD number</th>
<th>Chaffiness</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Tripleurospermum</em></td>
<td>Asteraceae (Compositae)</td>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td><em>Althaea</em></td>
<td>Malvaceae</td>
<td>16</td>
<td>C</td>
</tr>
</tbody>
</table>

Vote to accept item  
Yes votes | No votes | Result  
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C.3.1 | | accepted |

C.3.2. Harmonization of Pure Seed Definitions with PSD Handbook

Harmonization with PSD Handbook; “N.B.” replaced by “Note”; deletion of old family names; deletion of unnecessary brackets; all information which does not strictly describe the pure seed component moved to a Note. Some of these changes could be considered editorial but they are presented for a vote for transparency of actions to be taken.

Table 3B Part 2. Numbered pure seed definitions

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. …</td>
<td>1. … *Note 1: <em>Calendula</em>: the shape of the achene can vary. *Note 2: the seeds of some <em>Asteraceae</em>, e.g. <em>Glebionis carinata</em>, are very variable in shape, and can occur in different types: narrow and wide. Special attention is needed because some seeds look like inert matter.</td>
</tr>
<tr>
<td>2. … (<em>Gomphrena</em>: achene with or without hairy perianth, unless it is obvious that no seed is present.)</td>
<td>2. … <em>Gomphrena</em>: achene with or without hairy perianth, unless it is obvious that no seed is present.</td>
</tr>
<tr>
<td>4. …</td>
<td>4. … *Note: <em>Lactuca sativa</em> seeds are black or white depending on the variety.</td>
</tr>
<tr>
<td>8. …</td>
<td>8. … *Note: in some species of <em>Coreopsis</em> and <em>Dimorphotheca</em>, there are two different types of achene: flat and stick.</td>
</tr>
<tr>
<td>CURRENT VERSION</td>
<td>PROPOSED VERSION</td>
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<tr>
<td>9. …</td>
<td>9. … Note: Zinnia seeds can show variation in both shape and surface.</td>
</tr>
<tr>
<td>11. … Seeds and pieces of seed entirely without testa are regarded as inert matter. For Fabaceae (Leguminosae): separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>11. … Note 1: Seeds and pieces of seed entirely without testa are regarded as inert matter. Note 2: For Fabaceae: separated cotyledons are regarded as inert matter irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>12. Seed, with or without testa. N.B. Tests with or without hairs. Piece of seed larger than one-half the original size, with or without testa.</td>
<td>12. Seed, with or without testa, testa with or without hairs. Piece of seed larger than one-half the original size, with or without testa. Note: testa with or without hairs.</td>
</tr>
<tr>
<td>15. … N.B. Fruits with pieces of pedicel longer than the length of the schizocarp/mericarp are reported according to 3.7 (see also 3.5.2.8).</td>
<td>15. … Note: Fruits with pieces of pedicel longer than the length of the schizocarp/mericarp are reported according to 3.7 (see also 3.5.2.8).</td>
</tr>
<tr>
<td>20. … For Fabaceae (Leguminosae) only: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>20. … Note: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>21. … Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>21. … Note: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>22. … For Fabaceae (Leguminosae) only: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>22. … Note: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>23. … For Ornithopus compressus only, one-seeded pod segment, with or without attached empty pod segments or partial segments. Fabaceae (Leguminosae) and Brassicaceae (Cruciferae): Seeds and pieces of seed without testa are regarded as inert matter. For Fabaceae (Leguminosae) only: Separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>23. … Ornithopus compressus: one-seeded pod segment, with or without attached empty pod segments or partial segments. Note 1: Seeds and pieces of seed without testa are regarded as inert matter. Note 2: Fabaceae: separated cotyledons are regarded as inert matter irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>CURRENT VERSION</td>
<td>PROPOSED VERSION</td>
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<tr>
<td>24. … For Fabaceae (Leguminosae) only: Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter irrespective of whether or not the radicle-plumule axis and/or more than half of the testa may be attached.</td>
<td>24. … <strong>Note:</strong> Seeds and pieces of seed without testa are regarded as inert matter. Separated cotyledons are regarded as inert matter, irrespective of whether the radicle-plumule axis and/or more than half of the testa is attached.</td>
</tr>
<tr>
<td>28. … *(Elytrigia repens: floret with lemma and palea enclosing a caryopsis at least one-third the length of the palea measured from the base of the rachilla, with or without awn).</td>
<td>28. … *(Elytrigia repens: floret with lemma and palea enclosing a caryopsis at least one-third the length of the palea measured from the base of the rachilla, with or without awn.</td>
</tr>
<tr>
<td>29. … *(Phalaris: including protruding anthers if present).</td>
<td>29. … *(Phalaris: including protruding anthers if present.</td>
</tr>
<tr>
<td>30. Floret, with lemma and palea enclosing a caryopsis, excluding entire awn when the length of the awn is longer than the length of the floret. Caryopsis. Piece of caryopsis larger than one-half the original size.</td>
<td></td>
</tr>
<tr>
<td>33. … *(Festuca, Lolium, ×Festulolium: size of caryopsis at least one-third the length of the palea, measured from the base of the rachilla).</td>
<td>33. … *(Festuca, Lolium, ×Festulolium: size of caryopsis at least one-third the length of the palea, measured from the base of the rachilla.</td>
</tr>
<tr>
<td>… N.B. The floret may be … N.B. Where a uniform blowing method is used see 3.5.2.5.</td>
<td>… N.B. The floret may be … N.B. Where a uniform blowing method is prescribed, see 3.5.2.5.</td>
</tr>
<tr>
<td>Multiple seed units</td>
<td>Multiple seed units</td>
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<tr>
<td>… – one fertile floret with one fertile or sterile floret attached that extends to or beyond the tip of the fertile floret, excluding the awns (Fig. 3.1, structures 8–12).</td>
<td>… – One fertile floret with one attached fertile or sterile floret that extends to or beyond the tip of the fertile floret, excluding the awns (Fig. 3.1, structures 8–12).</td>
</tr>
<tr>
<td>– one fertile floret with more than one attached fertile and/or sterile floret of any length (Fig. 3.1, structures 5–7).</td>
<td>– One fertile floret with two or more attached fertile or sterile florets of any length (Fig. 3.1, 5–7).</td>
</tr>
<tr>
<td>– one fertile floret with basally attached sterile floret or glumes of any length (Fig. 3.1, structures 13–15).</td>
<td>– One fertile floret with basally attached sterile floret or glumes of any length (Fig. 3.1, structures 13–15).</td>
</tr>
<tr>
<td>CURRENT VERSION</td>
<td>PROPOSED VERSION</td>
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<tr>
<td><strong>N.B.</strong> MSUs are left intact and included in the pure seed fraction (see 3.5.2.6). <strong>N.B.</strong> For Triticum spelta and T. dicoccon only, with or without rachis segment attached. <strong>N.B.</strong> Combinations of MSUs may be found in Triticum spelta and T. dicoccon. These are not to be separated in the purity analysis. <strong>N.B.</strong> MSUs of Avena of the type of structure 13 (Fig. 3.1), where the lemma of the basal floret envelopes the inner fertile floret, need not be reported as MSUs. All other structures (Fig. 3.1, 5–12, 14–15) are to be considered MSU.</td>
<td><strong>Note 3:</strong> MSUs are left intact and included in the pure seed fraction. However, the applicant may request that they be weighed and the percentage reported (see 3.5.2.6). <strong>Note 4:</strong> For Triticum dicoccon and Triticum spelta only: with or without rachis segment attached. <strong>Note 5:</strong> In Triticum dicoccon and Triticum spelta, combinations of MSUs may be found. These are not to be separated in the purity analysis. <strong>Note 6:</strong> MSUs of Avena of the type of structure 13 (Fig. 3.1), where the lemma of the basal floret envelopes the inner fertile floret, need not be considered to be MSUs. All other structures (Fig. 3.1, 5–12 and 14–15) are to be considered MSU.</td>
</tr>
<tr>
<td>34. … <em>(Alopecurus: palea absent).</em></td>
<td>34. … Alopecurus: palea absent.</td>
</tr>
<tr>
<td>35. … <em>(Holcus: spikelet with glumes, lemma and palea enclosing a caryopsis, plus attached staminate floret, with or without awns).</em></td>
<td>35. … Holcus: spikelet with glumes, lemma and palea enclosing a caryopsis, plus attached staminate floret, with or without awns.</td>
</tr>
<tr>
<td>36. … <em>(Axonopus: spikelet, with single glume, lemma and palea enclosing a caryopsis, plus attached sterile lemma. Echinochloa and Melinis: attached sterile lemma with or without awn. (Panicum and Digitaria: no need to check for the presence of a caryopsis.)</em></td>
<td>36. … Axonopus: spikelet, with single glume, lemma and palea enclosing a caryopsis, plus attached sterile lemma. Echinochloa and Melinis: attached sterile lemma with or without awn. Panicum and Digitaria: no need to check for the presence of a caryopsis.</td>
</tr>
<tr>
<td>37. Spikelets (one fertile*, two sterile) enclosed in a beadlike involucre. <strong>N.B.</strong> The fertile spikelet consists of glumes, lemma and palea enclosing a caryopsis, plus attached sterile lemma. A caryopsis. Piece of caryopsis larger than one-half the original size.</td>
<td>37. Spikelets (one fertile*, two sterile) enclosed in a beadlike involucre. A caryopsis. Piece of caryopsis larger than one-half the original size. <strong>Note:</strong> The fertile spikelet consists of glumes, lemma and palea enclosing a caryopsis, plus attached sterile lemma.</td>
</tr>
<tr>
<td>38. … <em>(Alopecurus: palea absent.)</em></td>
<td>38. … Seeds with awns longer than the length of the floret are reported according to 3.7 (see also 3.5.2.8). <strong>Note:</strong> Seeds with awns longer than the length of the floret are reported according to 3.7 (see also 3.5.2.8).</td>
</tr>
<tr>
<td>39. Spikelet, with one glume*, lemma and palea enclosing a caryopsis. <strong>N.B.</strong> First glume absent, second glume completely infolding the thin lemma and palea, the palea sometimes obsolete. A caryopsis. Piece of caryopsis larger than one-half the original size.</td>
<td>39. Spikelet, with one glume*, lemma and palea enclosing a caryopsis. Piece of caryopsis larger than one-half the original size. <strong>Note:</strong> First glume absent, second glume completely infolding the thin lemma and palea, the palea sometimes obsolete.</td>
</tr>
<tr>
<td>CURRENT VERSION</td>
<td>PROPOSED VERSION</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>41. ... N.B. Where a uniform blowing method is used (Poa pratensis, P. trivialis) see 3.5.2.5. (Astrebla: spikelet and floret with or without caryopsis).</td>
<td>41. ... Astrebla: spikelet and floret with or without caryopsis. N.B. Where a uniform blowing method is used (Poa pratensis, P. trivialis), see 3.5.2.5.</td>
</tr>
<tr>
<td>42. ... <em>(Bouteloua, Chloris: no need to check for the presence of a caryopsis)</em></td>
<td>42. ... Note: Bouteloua, Chloris: no need to check for the presence of a caryopsis.</td>
</tr>
<tr>
<td>43. Fascicle or burr of 1–5 spikelets* with involucre of bristles. *N.B. Spikelet with glumes, lemma and palea enclosing a caryopsis, plus attached sterile lemma. ... <em>(Cenchrus: burr or fascicle, with or without caryopsis)</em></td>
<td>43. Fascicle or burr with an involucre of bristles and 1-5 spikelets, each comprising glumes, lemma and palea enclosing a caryopsis, plus attached sterile lemma. ... Cenchrus: burr or fascicle, with or without caryopsis.</td>
</tr>
<tr>
<td>46. ... N.B. Clusters with pieces of ...</td>
<td>46. ... Note: Clusters with pieces of ...</td>
</tr>
<tr>
<td>47. ... N.B. ‘Integument’ refers to the tissue attaching the wing to the seed. ...</td>
<td>47. ... Note: ‘Integument’ refers to the tissue attaching the wing to the seed....</td>
</tr>
<tr>
<td>48. ...</td>
<td>48. ... Note: Seeds are normally winged, are not weighed separately and are therefore all pure seed.</td>
</tr>
<tr>
<td>49. ...</td>
<td>49. ... Note: Seeds are normally winged, are not weighed separately and are therefore all pure seed.</td>
</tr>
<tr>
<td>51. ... N.B. ‘Integument’ refers to the tissue attaching the wing to the seed. ...</td>
<td>51. ... Note: ‘Integument’ refers to the tissue attaching the wing to the seed....</td>
</tr>
<tr>
<td>52. ...</td>
<td>52. ... Note: Samaras are normally winged, are not weighed separately and are therefore all pure seed.</td>
</tr>
<tr>
<td>53. ...</td>
<td>53. ... Note: Samaras are normally winged, are not weighed separately and are therefore all pure seed.</td>
</tr>
<tr>
<td>60. ... N.B. In many species of Eucalyptus ...</td>
<td>60. ... Note: In many species of Eucalyptus ...</td>
</tr>
<tr>
<td>62. ... N.B. Florets with awn ...</td>
<td>62. ... Note: Florets with awn ...</td>
</tr>
</tbody>
</table>

Jonathan Taylor (ISTA Secretariat):
“A number of these examples where ‘Note’ was removed originally simply said ‘N.B.’ Is everybody happy that these Notes, which no longer have the word ‘Note’, that they’re easily distinguishable from the actual Pure Seed Definition above? Because some of these Notes define what is to be regarded as inert matter.”

Jane Taylor (PUR):
“The additional notes that had never appeared in the Pure Seed Definitions shouldn’t go in, so where they were in the new Handbook, but had never been in the Rules, we withdrew those. And we were not so happy that ... OK, they may relate to inert matter, but we did feel they were integral to the clarification of what was pure seed and what was not, and they’ve been in the Rules a long time, particularly with the Fabaceae, where separated cotyledons are to be regarded as inert matter, whether or not more than the radical axis is present and half the testa, so we wanted to keep the
emphasis that they weren’t just an additional note, but they were integral to the Pure Seed Definition. And again, in the long PSD 33 with the MSUs as well.”

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.3.2</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>
Chapter 4: Determination of Other Seeds by Number

C.4.1. Inclusion of a test for Orobanche spp. in Chapter 4

Many countries require a phytosanitary plant health certificate for imported seed, declaring the ‘number of’ or ‘freedom from’ specific seed species or genera. Countries import requirements often list Orobanche spp. as a prohibited species, i.e. zero seed allowed. The seeds of Orobanche spp. are dust-like and easily adhere to other surfaces and laboratories are not required to routinely look for these species as part of the ISTA Determination of Other Seeds by Number (Chapter 4). Many exporting or importing countries have developed their own methods to test for this genera, the ISTA Purity Committee has surveyed its members and proposes the following method for use internationally to improve uniformity in testing.

The following proposals are put forward by and supported by the Purity Committee.

With this specific method for Orobanche an amendment to the existing definition of a complete test in Chapter 4 is required to make it explicit that dust-like seed is not searched for.

NOTE: the Bulking and Sampling Committee is investigating the best way to obtain the submitted and working sample for Orobanche testing. Until this is completed the results of an Orobanche test can only be reported on a Blue International Certificate (BIC). Previously laboratories could have included statements about Orobanche tests on an Orange International Certificate (OIC) if they indicated that this was a test not covered under the ISTA Rules (1.5.2.19). If this proposal is approved there will be an ISTA method for Orobanche testing therefore results of an Orobanche test could not be included on an OIC but would need to be reported separately on a BIC for the same seed lot.

If this proposal is accepted Chapter 1 will also need to be amended to reflect the changes for reporting.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2 Definitions</td>
<td>4.2 Definitions</td>
</tr>
<tr>
<td>………</td>
<td>………</td>
</tr>
<tr>
<td>a) A complete test is one in which the whole working sample (4.5.1a) is searched for all other seeds present.</td>
<td>a) A complete test is one in which the whole working sample (4.5.1a) is searched for all other seeds present, except for dust-like seeds such as Orobanche and Striga species. Testing for Orobanche spp. is only completed upon request of the customer applicant see 4.5.3.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
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</tr>
</thead>
<tbody>
<tr>
<td>C.4.1.B</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>
Proposed new text to be added for Orobanche search method:
NOTE: To make reading easier although this is new text it has not been made blue or underlined.

4.5.3 Determination of Orobanche species

On request of the applicant a determination for the presence of Orobanche spp. will be completed, allowing the number of Orobanche spp. found in a specified weight of a submitted subsample to be reported.

4.5.3.1 Background
Orobanche spp. are root parasites and can cause very significant reduction in crop yield of the host plants. The flowering shoots produce large numbers of very fine, dust-like seeds. Seed size, shape, colour and surface markings vary somewhat with each Orobanche species but all are basically similar. The seeds of all species of Orobanche are usually pear-shaped, under 0.5 mm long, often 0.3 to 0.2 mm long with a smaller width, seed width varies by species and seeds tend to adhere to the crop seed and other surfaces.

The determination requires microscopic analysis of the working sample and visual recognition of Orobanche species by the analyst. The working sample is obtained from the submitted or composite sample either by: a) washing and filtration, or b) dry sieving. The laboratory must decide on the most appropriate method to use to obtain the working sample, both have been proved to be satisfactory but effectiveness can vary with the size of the crop species seed under test. For crop species which have very small seeds either method is difficult but when a seed lot is very expensive, or needs to be returned to the customer, then the dry method is more appropriate.

4.5.3.3 Working sample
The working sample for visual analysis for the presence of Orobanche species is obtained by either: a) washing and filtration or b) dry sieving the whole (entire) weight of the submitted subsample.

a) Washing and filtration
The whole (entire) submitted subsample is washed in water containing a surfactant/detergent, filtered and the residue collected on the surface of the filter paper analysed. The seed weight to water volume ratio should be 1:2, e.g. 250g of seed added to 500 ml of water containing one or two drops of surfactant. Large submitted samples may require washing of small batches but the whole submitted subsample is tested.

b) Dry sieving
The whole (entire) submitted subsample is sieved ‘dry’ using a sieve and a bottom collecting tray which are shaken by a mechanical shaker (e.g. Syntron shaker) or manually. The diameter of the hole in the screen-sieve should be adequate to retain the crop seed on top and allow the finer dust-like material to go through to the collection pan, e.g. for Trifolium pratense a suitable diameter of the sieve mesh (round holes) is 0.5 mm. Other combinations of sieves can be used depending on the size of the crop seed being tested.

Large submitted samples may require sieving of small batches to avoid overloading/plugging the holes of the sieve. The size of loading in every batch depends on the size of the crop seed, the diameter of the sieves and the number of holes in every square inch of sieve. For each sieving operation the sample should be shaken for at least 1 minute if a mechanical shaker is used. If the shaking is manual, the sample should be shaken vigorously for a longer period until the finer material is fully separated. The sievings collected in the bottom collecting tray from the whole submitted sample are then examined visually.

4.5.3.4 Visual analysis
Analysts must search the surface of the filter paper or dry sievings for Orobanche seeds using a microscope with at least x10 magnification. The number of Orobanche seeds present is determined and reported according to 4.7.

**Proposed additional new text to be included under 4.7 Reporting results:**

4.7 Reporting results

Upon request the presence of Orobanche species can only be reported on a Blue International Seed Sample Certificate (see 1.2.2) and must be reported as:

Test for presence of Orobanche species.

‘… seeds of Orobanche spp. were found in … g of seed examined (entire sample).’

If no seeds were found it can be reported as:

‘No seeds of Orobanche spp. were found in … g of seed examined (entire sample).’

The entire sample weight examined must be reported according to the minimum number of decimals indicated in Table 4.1.

**Table 4.1 Minimum number of decimal places for reporting weights of submitted samples examined.**

<table>
<thead>
<tr>
<th>Weight of submitted sample (g)</th>
<th>Minimum number of decimal places for reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1.000</td>
<td>4</td>
</tr>
<tr>
<td>1.000–9.999</td>
<td>3</td>
</tr>
<tr>
<td>10.00–99.99</td>
<td>2</td>
</tr>
<tr>
<td>100.0–999.9</td>
<td>1</td>
</tr>
<tr>
<td>≥1000</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.4.1.A</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>
C.4.2. Required change to 1.5.2.4 if C4.1 is accepted

If proposal C.4.1. is accepted then 1.5.2.4 must also be amended to include how to report the results of the *Orobanche* test.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
</table>
| 1.5.2.4 Determination of other seeds by number  
Upon request, the results may in addition be expressed in some other way, such as ‘weight of seeds found’ or ‘number of seeds per kilogram’. | 1.5.2.4 Determination of other seeds by number  
Upon request, the results may in addition be expressed in some other way, such as ‘weight of seeds found’ or ‘number of seeds per kilogram’.  
Upon request the presence of *Orobanche* species can be reported, but only on a Blue International Seed Sample Certificate (see 1.2.2) and must be reported as follows:  
Test for presence of *Orobanche* species:  
... seeds of *Orobanche* spp. were found in .... g of seed examined (entire sample).  
If no seeds were found it can be reported as:  
No seeds of *Orobanche* spp. were found in .... g of seed examined (entire sample).  
The entire sample weight examined must be reported according to the minimum number of decimals indicated in Table 4.1. |

Vote to accept item | Yes votes | No votes | Result |
-------------------|-----------|---------|--------|
C.4.2              |           | 1       | accepted |
C.4.3. Reporting of actual sample weight

The current Rules require the reporting of the actual weight examined but it is not specified to how many decimal places. This proposal makes reference to the new Table 4 used in the Orobanche method proposed in C.4.1. If the Orobanche proposal is not accepted Table 4 will still need to be added for this proposal to make sense. The following proposals are put forward by and supported by the Purity Committee.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.7 Reporting results</td>
<td>4.7 Reporting results</td>
</tr>
<tr>
<td>........</td>
<td>........</td>
</tr>
<tr>
<td>The actual weight of seeds examined.</td>
<td>The actual weight of seeds examined to the minimum number of decimal places indicated in Table 4.1.</td>
</tr>
</tbody>
</table>

Vote to accept item

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.4.3</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>
C.4.4. Required change if C4.3 is accepted

If C4.3. is accepted 1.5.2.4 must also be amended.

<table>
<thead>
<tr>
<th>Current Version</th>
<th>Proposed Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5.2.4 Determination of other seeds by number</td>
<td>1.5.2.4 Determination of other seeds by number</td>
</tr>
<tr>
<td>The result of a determination of other seeds by number must be reported under ‘Other determinations’ as follows:</td>
<td>The result of a determination of other seeds by number must be reported under ‘Other determinations’ as follows:</td>
</tr>
<tr>
<td>– The actual weight of seed examined.</td>
<td>– The actual weight of seeds examined to the minimum number of decimal places indicated in Table 4.1.</td>
</tr>
<tr>
<td>– The scientific name and number of seeds.</td>
<td>– The scientific name and number of seeds.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vote to accept item</th>
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</thead>
<tbody>
<tr>
<td>C.4.4</td>
<td></td>
<td></td>
<td>accepted</td>
</tr>
</tbody>
</table>
Chapter 5: The Germination Test

C.5.1. Use of vacuum counters

Some laboratories using vacuum counters apply vacuum when seeds are put on the counting head, for different reasons:

– seeds may fall down easily outside the counting head when the vacuum is switched off;
– applying vacuum after the seeds have been deposited on the counting head requires more frequent seed handlings in order to replace them correctly;
– less time is needed for this operation when large numbers of tests have to be performed.

In order to avoid deviation of replicate results, the laboratory must demonstrate that this does not affect germination results.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5.2 Counting equipment</td>
<td>5.5.2 Counting equipment</td>
</tr>
<tr>
<td>Planting using counting boards or vacuum counters is permissible, as long as using these tools does not influence the germination result or cause replicate results to be biased. With vacuum counters, some precautions should be observed to avoid biased replicates: the counting head must not be plunged into the working sample, and the vacuum must not be applied when seeds are poured onto the counting head, as both result in the selection of light seed.</td>
<td>Planting using counting boards or vacuum counters is permissible, as long as using these tools does not influence the germination result or cause replicate results to be biased. With vacuum counters, some precautions should be observed to avoid biased replicates: the counting head must not be plunged into the working sample, as this could result in the selection of light seed. It is preferable to switch off the vacuum when seeds are poured onto the counting head. If the vacuum is applied while the seeds are being poured onto the counting head, it must be shown that this does not affect the germination results. Examples of how to use the counting equipment are given in the ISTA Handbook on Seedling Evaluation.</td>
</tr>
</tbody>
</table>

Vote to accept item

<table>
<thead>
<tr>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.5.1</td>
<td></td>
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</tr>
</tbody>
</table>
C.5.2. Amendment to Reporting section 5.9 to link with proposal C.1.1

Note: if C.1.1 has been accepted this must be accepted.
Proposed by the Germination Committee.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.9 Reporting results ...</td>
<td>5.9 Reporting results ...</td>
</tr>
<tr>
<td>– the method used;</td>
<td>– the method used;</td>
</tr>
<tr>
<td>– the number of seeds used to calculate the percentages, if less than 400 seeds are tested.</td>
<td>– the method for evaluating fresh seeds (dissection, tetrazolium or excised embryo – see paragraph 5.6.5.3.) when 5% or more of fresh seeds are believed to be present</td>
</tr>
<tr>
<td>The following additional information must also be reported under ‘Other determinations’;</td>
<td>– the germination method using the abbreviations used in Table 5A, including at least substrate and temperature;</td>
</tr>
<tr>
<td>– the germination method using the abbreviations used in Table 5A, including at least substrate and temperature;</td>
<td>– the duration in days of any special treatment or method used for promoting germination, except in the case of prestorage.</td>
</tr>
<tr>
<td>– any special treatment or method used for promoting germination (5.6.3);</td>
<td>– any special treatment or method used for promoting germination (5.6.3);</td>
</tr>
<tr>
<td>– the duration in days of any special treatment or method used for promoting germination, except in the case of prestorage.</td>
<td>– the duration in days of any special treatment or method used for promoting germination, except in the case of prestorage.</td>
</tr>
<tr>
<td>– When double tests are ...</td>
<td>– the germination percentage obtained within the prescribed time, if the germination period was extended beyond the period indicated in Table 5A. The statement must be entered as follows: “After the prescribed period of ... days, there were ... % normal seedlings.”</td>
</tr>
<tr>
<td></td>
<td>– When double tests are ...</td>
</tr>
</tbody>
</table>

Vote to accept item | Yes votes | No votes | Result
--- | --- | --- | ---
C.5.2 | | | accepted

OM approved 2012-03-27 16:59
OM12-02 Minutes of the Ordinary Meeting 2011_OM approved 14.06.2012.doc
Approved by ECOM Decision No. 648 and 656 / Ordinary Meeting approved on June 14, 2012 Page 53/94
C.5.3. New germination method for *Solanum nigrum*

Lea Mazor has been the driving force behind the work to propose a validated germination method for *Solanum nigrum*. The proposed method is shown below and is supported by the Germination Committee. The completed validation study is available on the ISTA website.

### Table 5A Part 1 Agricultural and vegetable seeds

<table>
<thead>
<tr>
<th>Species</th>
<th>Substrate</th>
<th>Temperature (°C)</th>
<th>First count (d)</th>
<th>Final count (d)</th>
<th>Recommendations for breaking dormancy</th>
<th>Additional directions</th>
<th>Additional advice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solanum nigrum</td>
<td>TP</td>
<td>20&lt;=&gt;30 °C</td>
<td>7</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
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<tr>
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<td></td>
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</table>
Chapter 6: The Tetrazolium Test

C.6.1 Clarification of test definition

Amendments have been proposed by the Tetrazolium Committee to make the Tetrazolium Chapter more precise and clear.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>6.2 Definition</strong> §3</td>
<td><strong>6.2 Definition</strong> §3</td>
</tr>
<tr>
<td>The test is valid for all species for which a method is described in Table 6A. If the result is to be reported on an ISTA International Seed Analysis Certificate, the test must be carried out in accordance with the methods described in this Chapter.</td>
<td>The test is valid for all species for which a method is described in Table 6A. If the result is to be reported on an ISTA International Seed Analysis Certificate, the test must be carried out in accordance with the methods described in this Chapter.</td>
</tr>
<tr>
<td><strong>WITHDRAWN</strong> by the TEZ with agreement by ECOM.</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Item</th>
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<tr>
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<td>Withdrawn by TEZ</td>
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</table>

C.6.2. Clarification of premoistening procedure

<table>
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<tr>
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<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.5.2.1. Premoistening the seed</strong></td>
<td><strong>6.5.2.1. Premoistening the seed</strong></td>
</tr>
<tr>
<td>Premoistening is a necessary preliminary step to staining for some species and a highly recommended one for others. Imbibed seeds are generally less fragile than dry seeds and can be cut or punctured more readily. In addition, staining of premoistened seed is more even in colour and this facilitates evaluation. The minimum premoistening period at 20 °C is indicated in Table 6A. <strong>If the seed coat hampers imbibition, the coat must be punctured (e.g. Fabaceae (Leguminosae)).</strong> If a higher or lower temperature is used than that recommended, then the premoistening period must be adjusted accordingly, and any variation in premoistening time or temperature must be reported on the ISTA Certificate.</td>
<td>Premoistening is a necessary preliminary step to staining for some species and a highly recommended one for others. Imbibed seeds are generally less fragile than dry seeds and can be cut or punctured more readily. In addition, staining of premoistened seed is more even in colour and this facilitates evaluation. <strong>If the seed coat hampers imbibition, the coat must be punctured (e.g. Fabaceae (Leguminosae)).</strong> The minimum premoistening period is indicated in Table 6A. If a higher (but not higher than 40 °C ± 2 °C) or lower temperature is used <strong>from that recommended,</strong> then the premoistening period <strong>must</strong> be adjusted accordingly, and any <strong>variation</strong> in premoistening time or temperature <strong>must</strong> be reported on the ISTA Certificate.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Yes votes</td>
<td>No votes</td>
<td>Result</td>
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<td>accepted</td>
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</table>
C.6.3. **Variation** from standard staining temperatures

<table>
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<tr>
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<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6.5.3 Staining</strong>&lt;br&gt;$\S$ 2&lt;br&gt;The solution should not be exposed to direct light as this brings about a reduction of the tetrazolium salt. Table 6A gives details of optimum temperatures and staining times. Staining periods …</td>
<td><strong>6.5.3 Staining</strong>&lt;br&gt;$\S$ 2&lt;br&gt;The solution should not be exposed to direct light as this brings about a reduction of the tetrazolium salt. Table 6A gives details of optimum temperatures and staining times. Staining temperatures used may deviate from those given in Table 6A, but must be in the range of 20–40 °C. If the optimum staining temperature of 30 °C is not used, then suitable adjustments in staining duration must be made, as an increase/decrease of 5 °C from the optimum of 30 °C reduces/increases staining time by one half. Staining periods …</td>
</tr>
</tbody>
</table>

Vote to accept item | Yes votes | No votes | Result
--- | --- | --- | ---
C.6.3 | | | accepted

C.6.4. Procedure with hard seeds

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<th>PROPOSED VERSION</th>
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<tbody>
<tr>
<td><strong>6.5.4 Evaluation</strong>&lt;br&gt;$\S$ 5&lt;br&gt;Hard seeds are seeds with water-impermeable seed coats (e.g. Fabaceae) and remain hard even after premoistening. If the viability of these seeds needs to be determined, follow the instructions in Table 6A Column 8.</td>
<td><strong>6.5.4 Evaluation</strong>&lt;br&gt;$\S$ 5&lt;br&gt;Hard seeds are seeds with water-impermeable seed coats (e.g. Fabaceae) and remain hard even after premoistening. If the viability of these seeds needs to be determined, follow the instructions in Table 6A Column 8.</td>
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</table>

Vote to accept item | Yes votes | No votes | Result
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C.6.4 | | | accepted
### C.6.5. Clarification of 6.7 Reporting results

Changes proposed by Tetrazolium Committee. Note: if this proposal is accepted then the text in 1.5.2.8 must also be updated and follows this proposal.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
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<tbody>
<tr>
<td><strong>6.7 Reporting results</strong></td>
<td><strong>6.7 Reporting results</strong></td>
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<tr>
<td>The result of a tetrazolium test must be reported under ‘Other determinations’ as follows:</td>
<td>The result of a tetrazolium test must be reported under ‘Other determinations’ as follows:</td>
</tr>
<tr>
<td>– The statement ‘Tetrazolium test: …% of seeds were viable’ must be entered.</td>
<td>– The statement ‘Tetrazolium test: …% of seeds were viable’ must be entered.</td>
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<tr>
<td>- In cases where the testing procedure (premoistening time, tetrazolium concentration, staining temperature, staining time) deviates from that prescribed in Table 6A, the corresponding deviating procedure must also be reported.</td>
<td>- In cases where the testing procedure deviates from that prescribed in Table 6A, any deviating procedure must also be reported.</td>
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<tr>
<td>- If individual seeds are tested at the end of the germination test, the result must be reported in accordance with 5.9.</td>
<td>- If individual seeds are tested at the end of the germination test, the result must be reported in accordance with 1.5.2.6 and 5.9.</td>
</tr>
<tr>
<td>In addition, in the case of species of Fabaceae, one of the following, and only one, must be reported: either — the percentage of hard seeds found in the test or — the percentage of hard seeds included in the reported percentage of viable seeds.</td>
<td>In addition, in the case of species of Fabaceae, one of the following, and only one, must be reported: either (in cases where the viability percentage of the hard seed is not determined) Tetrazolium test: ...% of seeds were viable, ...% of hard seeds found in the test or (in cases where the viability percentage of the hard seed is determined) Tetrazolium test: ...% of seeds were viable, ...% of hard seeds included in the percentage of viable seed.</td>
</tr>
<tr>
<td>At the discretion of the seed testing laboratory, further information may be reported, e.g. percentage of seeds that were empty, with larvae, broken or decayed.</td>
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C.6.6. Required changes to 1.5.2.8 if C6.5 is accepted

<table>
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<tbody>
<tr>
<td><strong>1.5.2.8 Tetrazolium test</strong></td>
<td><strong>1.5.2.8 Tetrazolium test</strong></td>
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</table>
| The result of a tetrazolium test must be reported under ‘Other determinations’ as follows:  
  – The statement ‘Tetrazolium test: ...% of seeds were viable’ must be entered.  
  - In cases where the testing procedure (premoistening time, tetrazolium concentration, staining temperature, staining time) deviates from that prescribed in Table 6A, the corresponding deviating procedure must also be reported. | The result of a tetrazolium test must be reported under ‘Other determinations’ as follows:  
  – The statement ‘Tetrazolium test: ...% of seeds were viable’ must be entered.  
  - In cases where the testing procedure deviates from that prescribed in Table 6A, any deviating procedure must also be reported.  
  The only variations permitted from procedures given in Table 6A are for premoistening time, tetrazolium concentration, staining temperature or staining time. Precise prescriptions about the limitation of the variations are given in 6.5.  
  - If individual seeds are tested at the end of the germination test, the result must be reported in accordance with 1.5.2.6 and 5.9.  
  In addition, in the case of species of Fabaceae, one of the following, and only one, must be reported:  
  *either* the percentage of hard seeds found in the test  
  or *the percentage of hard seeds included in the reported percentage of viable seeds.  
  At the discretion of the seed testing laboratory, further information may be reported, e.g. percentage of seeds that were empty, with larvae, broken or decayed. |

- If individual seeds are tested at the end of the germination test, the result must be reported in accordance with 1.5.2.6 and 5.9.

In addition, in the case of species of Fabaceae, one of the following, and only one, must be reported:

*either* (in cases where the viability percentage of the hard seed is not determined)  
Tetrazolium test: ...% of seeds were viable, ...% of hard seeds found in the test  
or (in cases where the viability percentage of the hard seed is determined)  
Tetrazolium test: ...% of seeds were viable, ...% of hard seeds included in the percentage of viable seed  
At the discretion of the seed testing laboratory, further information may be reported, e.g. percentage of seeds that were empty, with larvae, broken or decayed.

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</table>
C.6.7. Variation from standard temperature for staining

Proposal from the Tetrazolium Committee to clarify the allowed deviation from the 30 °C temperature used for staining.

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<thead>
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<td>6.8 Standard procedures for tetrazolium testing</td>
<td>6.8 Standard procedures for tetrazolium testing</td>
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<tr>
<td>…</td>
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<tr>
<td>Column 5: Optimum staining time</td>
<td>Column 5: Optimum staining time</td>
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<tr>
<td>Optimum staining time in hours based on a temperature of 30 °C.</td>
<td>Optimum staining time in hours based on a temperature of 30 °C ±2 °C.</td>
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**C.6.8. Changes to Table 6A**

Proposal from the Tetrazolium Committee to clarify the information provided.

<table>
<thead>
<tr>
<th>Table 6A Part 1. Agricultural and horticultural seeds</th>
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<tbody>
<tr>
<td><strong>Species</strong></td>
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<tr>
<td>-------------</td>
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<tr>
<td></td>
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<tr>
<td>1</td>
</tr>
<tr>
<td>Agrostis spp.</td>
</tr>
<tr>
<td>BP/16, W/2</td>
</tr>
<tr>
<td>Chloris gayana</td>
</tr>
<tr>
<td>Lotus spp.</td>
</tr>
<tr>
<td>Medicago spp.</td>
</tr>
<tr>
<td>Melilotus spp.</td>
</tr>
<tr>
<td>Onobrychis spp.</td>
</tr>
<tr>
<td>Ornithopus spp.</td>
</tr>
<tr>
<td>Panicum spp.</td>
</tr>
<tr>
<td>BP/18, W/6</td>
</tr>
<tr>
<td>Phleum spp.</td>
</tr>
<tr>
<td>BP/16, W/2</td>
</tr>
<tr>
<td>Trifolium spp.</td>
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</table>

**Vote to accept item**

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</table>
Annex to Chapter 7: Seed Health Testing Methods

C.7.1. Revised seed health method: *Botrytis cinerea* on *Helianthus annuus*

This proposal is submitted by the Seed Health committee and is supported by a validation study.

Revised 7-003: Detection of *Botrytis cinerea* on *Helianthus annuus* (Sunflower)

**Crop:** *Helianthus annuus* (Sunflower)

**Pathogen:** *Botrytis cinerea* Pers. ex Pers. **Perfect state:** *Sclerotinia fuckeliana* (de Bary) Fuckel.

**Prepared by:** V. Grimault, I. Serandat, C. Poisblaud, Q. Brunelle, C. Brochard
GEVES-SNES, rue Georges Morel, BP 90024, 49071 Beaucouzé Cedex, France; e-mail: valerie.grimault@geves.fr

**Sponsored by:** ISTA Seed Health Committee

**Revision history:**
- Version 1.0, 2001-02-26
- Revised 2001-02-26 J. Sheppard, V. Cockerell
- Reprinted 2003
- Version 1.1 2008-01-01: “Treated seed” revised; “Reporting results” revised
- Version 2.0, 2010-11-01; Modification of method

**Submitted by:** ISTA-PDC Method Validation Sub-committee

**Background**

This method was originally published in the ISTA Handbook of Seed Health Testing in 1981 as Working Sheet No. 44 prepared by C. Anselme and R. Champion, La Minière, France. The method was incorporated into the newly revised Annexe to Chapter 7 in 2002 from the 1999 edition of the ISTA Rules. The method was reviewed by the ISTA-Seed Health Committee in 2006 (Cockerell & Koenraadt, 2007) with the recommendation to accept for a further five years.

An ISTA Proficiency test for Method 7-003 highlighted problems with both over- and underestimation of *Botrytis cinerea* by laboratories. Confusion with saprophytes may have caused overestimation by some laboratories, while differences in the criteria as to when a seed is infected (presence of one conidiophore versus soft rot on roots) led to underestimation of *B. cinerea* by some laboratories. The ISTA SHC agreed that an experiment be carried out to establish whether the use of a malt solution exacerbates the proliferation of saprophytes, leading to incorrect assessments by laboratories. The results showed when malt solutions of 1% and 3% were used, *B. cinerea* levels were significantly higher than the true value after 9 days’ incubation, and also after 7 days with 3% malt. The malt solution was also shown to increase the saprophyte count compared to no malt.

New morphological criteria was described for the determination of infected seed during the SHC Workshop in South Africa, 2008, and finally agreed at the SHC workshop in SNES, France, 2–5 March 2010.

As a result of this work the following changes have been made:
- removal of malt solution;
- blotters now soaked with distilled/de-ionised water;
- incubation reduced to 7 days, with examinations made at 5 and 7 days.

**Validation studies**

Safety precautions

Ensure that you are familiar with hazard data and take appropriate safety precautions, especially during preparation of media, autoclaving and weighing out of ingredients. It is assumed that this procedure is being carried out in a microbiological laboratory by persons familiar with the principles of Good Laboratory Practice, Good Microbiological Practice, and aseptic technique. Dispose of all waste materials in an appropriate way (e.g. autoclaving or disinfection) and in accordance with local safety regulations.

Treated seed

This method has not been validated for the determination of Botrytis cinerea on treated seed. Seed treatments may affect the performance of the method. (Definition of treatment: any process, physical, biological or chemical, to which a seed lot is subjected, including seed coatings. See 7.2.3)

Materials

Reference material: the use of reference cultures or other appropriate material is recommended whenever possible.  
Media: blotters (filter paper), e.g. Whatman No. 1 or equivalent.  
Petri dishes: when sowing density is given by a number of seeds per Petri dish, a diameter of 90 mm is assumed.  
Incubator: capable of operating in the range 20 ± 2 °C.

Sample preparation

The test is carried out on a working sample of 400 seeds as described in Section 7.4.1 of the ISTA Rules.

Method

1. Pretreatment
None.

2. Plating
Place two pieces of blotters (88 mm in diameter) in each 90 mm Petri dish and soak with distilled/de-ionized water. Drain away excess distilled/de-ionized water. Place 5 seeds in each Petri dish.

3. Incubation
7 days at 20 °C in darkness.

4. Examination
Examination is carried out after 5 and 7 days. A contaminated seed could present several criteria; one of these criteria is sufficient for the seed to be recorded as infected.

Examination by naked eye

- A soft rot, covered by an abundant grey mycelium (Fig. 1); the presence of mycelium with sporulation is needed, since soft rots can also be due to saprophytes.
Examination by high-power microscope (magnification x150-200)

- Tape-like hyphae producing bunches of branching conidiophores (Figs. 2 and 3)
- Isolated conidiophore on teguments, cotyledons or the root (Fig. 4). In doubtful cases, confirmation may be made by examining the mycelium under the microscope (x150) for tape-like hyphae and ovoid, hyaline one-celled conidia 8–11 × 6–19 μm (Fig. 5).
- Non-sporulated mycelium of *Botrytis cinerea* on teguments, cotyledons or the root, recognizable by tape-like hyphae (Fig. 6).

![Figure 1](image1.png)

**Figure 1:** Soft rot of the root with abundant grey mycelium of *Botrytis cinerea*.

![Figure 2](image2.png)

**Figure 2:** Sporulated mycelium with tape-like hyphae of *Botrytis cinerea*.

![Figure 3](image3.png)

**Figure 3:** Sporulated mycelium of *Botrytis cinerea*. 
General methods (common to many test procedures)

1. Checking tolerances
Tolerances provide a means of assessing whether or not the variation in result within or between tests is sufficiently wide as to raise doubts about the accuracy of the results. Suitable tolerances, which can be applied to most direct seed health tests, can be found in Tables 5B of Chapter 5 of the ISTA Rules, or in the Handbook of Tolerances and Measures of Precision for Seed Testing by S.R. Miles (Proceedings of the International Seed Testing Association 28 (1963) No 3, p 644).

2. Reporting results
The result of a seed health test should indicate the scientific name of the pathogen detected and the test method used. When reported on an ISTA Certificate, results are entered under Other Determinations.

Quality assurance

Critical control points

None listed.

References


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<thead>
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<th>Vote to accept item</th>
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<td>C.7.1</td>
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</table>
C.7.2. New seed health method: *Ustilago nuda* on *Hordeum vulgare*

This proposal is submitted by the Seed Health committee and is supported by a validation study. The existing 7-013 will need to be renumbered as 7-013a if this new method is accepted.

**7-013b: Detection of *Ustilago nuda* on *Hordeum vulgare* (Barley) by dehulling method and floating embryo extraction**

*Crop:* *Hordeum vulgare* (Barley)  
*Pathogen:* *Ustilago nuda* (Jens.) Rost r.  
*Prepared by:* Karin Sperlingsson  
Swedish Board of Agriculture, Seed Division, Box 83  
SE 268 22 Svalöv, Sweden  
E-mail: karin.sperlingsson@jordbruksverket.se  
*Sponsored by:* ISTA Seed Health Committee, *Ustilago nuda* Working Group and Nordic *Ustilago* Working Group  
*Revision history:* Version 1.0, 2010-10-01.  
*Submitted by:* Nordic Seed Pathology Working Group and ISTA Seed Health Committee.

**Background**

Since the 1970s, the Nordic laboratories have used a modification of ISTA method 7-013a described by Joëlson (1968). The method described here differs from 7-013a in the embryo extraction technique and the procedure used to clear embryos for examination of the *Ustilago* mycelium. A validation study comparing the two methods was carried out. Three seed lots with infection levels between 1% and 4% were tested by three laboratories using both the current method 7-013a and the ‘Nordic’ Method (7-013b). The validation study shows that the two methods produce equivalent results (Sperlingsson, 2011). The Nordic method offers an alternative method for laboratories that do not have access to plentiful warm water, nor a fume hood. The alternative embryo-clearing process adds a day to the duration of the test, so may not be suitable where a quicker turnaround is required. It does, however, offer an alternative clearing procedure which could be used in combination with the existing method to provide flexibility of resources within laboratories during busy periods.

**Validation studies**

Sperlingsson, K. (2011). Copies are available by e-mail from ista.office@ista.ch or by mail from the ISTA Secretariat.

**Safety precautions**

Ensure that you are familiar with hazard data and take appropriate safety precautions. It is assumed that this procedure is being carried out in a laboratory by persons familiar with the principles of Good Laboratory Practice. Great care must be taken when working with sulphuric acid and sodium hydroxide; the analyst should wear full protective clothing. Dispose of all waste materials in an appropriate way and in accordance with local health, environmental and safety regulations.

**Treated seed**

This method has not been validated for the determination of *Ustilago nuda* on treated seed. Seed treatments may affect the performance of the method.
(Definition of treatment: any process, physical, biological or chemical, to which a seed lot is subjected, including seed coatings. See 7.2.3)

Materials

Reference material: seed known to be infected or other appropriate material.
Oven: capable of operating at 75 ± 5 °C.
Sulphuric acid (H₂SO₄): concentration 25–37% by weight.
Electric hand mixer: at low speed.
Sodium hydroxide + sodium chloride: 10–15% NaOH plus 110–175 g salt per litre of solution.
Brass sieves: 1 mm mesh, with one additional sieve of larger mesh (approx. 2.4 mm) and an additional fine sieve with mesh smaller than 1 mm.
Glycerol-ethanol solution: one part glycerol to two parts ethanol.
Lactic acid: more than 70%.
95% ethanol
Glycerol (glycerine)
Microscope: with substage illumination.

Sample preparation

The test is carried out on a working sample as described in section 7.4.1 of the International Rules for Seed Testing. The method was validated on a maximum sample size of 120 g, and 1000 embryos were examined. Seed can be prepared either by weight or by counting.

Method

Dehulling

1. Place the working sample in a glass beaker with 25–37% H₂SO₄ until the seeds are covered.
2. Incubate in an oven at 75 °C for 50 minutes or until the seeds turn a medium-brown colour.
3. Carefully pour off the H₂SO₄ solution. Rinse seeds by pouring water into the beaker, gently mix and pour out the water. Add new water and remove the loosened hulls by stirring robustly with a rod. Remove hulls by carefully removing the water. If hulls remain, add new water, and either use an electric hand mixer at low speed (maximum 3 minutes) or continue stirring. Repeat procedure until all hulls are removed. Be careful not to lose any kernels (seed without hulls).
4. Place drained kernels in a container with the NaOH-NaCl solution.
5. Incubate overnight (approximately 15 hours) in 22 ± 3 °C.
6. Stir mixture gently to loosen the embryos from the kernels. Pour the loosened embryos which float to the top of the liquid into a beaker.
7. Repeat the procedure until all embryos are released.
8. To ensure that there are no remaining embryos, place the dissolved kernels on top of a coarse sieve combined with a fine sieve. The coarse sieve shall have a mesh of approximately 2.4 mm, enough to let the embryos pass but retain the remains of the kernels. The fine sieve should have a mesh of 1 mm. If there are any embryos in the bottom sieve, add these to the beaker.
9. Using a fine sieve, drain the NaOH-NaCl solution from the embryos and rinse in running water for approximately 10 s.
10. If there is a large amount of chaff with the embryos, add water and remove the floating chaff.
11. Drain the embryos, place in a beaker and cover with lactic acid.

12. Incubate overnight in an oven at 75 ± 5 °C

13. Using a fine sieve, drain the lactic acid from the embryos. The embryos can be made more transparent by being washed in ethanol or covered for a few minutes in 95% ethanol. Cover the embryos with glycerine-ethanol (95%) (1:3) solution or pure glycerine.

14. Examine the embryos under the microscope according to ISTA method 7-013a.

**General methods (common to many test procedures)**

**Reporting results**
The result of a seed health test should indicate the scientific name of the pathogen detected and the test method used. When reported on an ISTA Certificate, results are entered under Other Determinations.

**Quality assurance**

**Critical control points**
None listed.

**Preparation of chemicals**

**Preparation of sulphuric acid**
For safety reasons, ready-made sulphuric acid 25–37% (by weight) is preferable.
If ready-made 25-37% sulphuric acid is not available, add concentrated sulphuric acid to water. Not the reverse, never add water to acid! The density of H₂SO₄ is 1.8356 g/mL. The quantity is calculated depending on the required concentration. Weight/density = volume.

**Preparation of sodium hydroxide**
For safety reasons, ready-made NaOH solution 10–15% or ready-made NaOH-NaCl is preferable.
If these are not available, dissolve 130–175 g sodium hydroxide pellets and 110–150 g sodium chloride in 1 L of cold tap water.

**References**

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<th>Vote to accept item</th>
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<td>C.7.2</td>
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</table>
C.7.3. New seed health method: Pyrenophora teres and P. graminea on Hordeum vulgare

This proposal is submitted by the Seed Health committee and is supported by a validation study.

7-027: Osmotic method for the detection of Pyrenophora teres and P. graminea on Hordeum vulgare

Crop: Hordeum vulgare (Barley)
Pathogen: Pyrenophora teres Drechsler (anamorph: Drechslera teres (Sacc.) Shoem.) P. graminea Ito & Kurib., in Ito (anamorph: D. graminea (Rabenh. ex Schlecht.) Shoem.)

Prepared by: Sperlingsson, K.
Swedish Board of Agriculture, Seed Division, Box 83 SE 268 22 Svalöv Sweden
E-mail: karin.sperlingsson@jordbruksverket.se
Brodal, G.
Bioforsk - Norwegian Institute for Agricultural and Environmental Research, Plant Health and Plant Protection Division, Høgskoleveien 7 N-1432 Ås, Norway
E-mail: guro.brodal@bioforsk.no

Submitted by: Nordic Seed Pathology Working Group and ISTA Seed Health Committee.

Background

Pyrenophora teres and P. graminea are seed-transmitted fungi in barley. Plants infected with P. graminea will not give any yield. Infection with seed-borne P. teres contributes to yield reduction, especially if plants are infected early.

Previous methods published by ISTA for the detection of these pathogens were the freezing blotter method (1964a) in S. 3. No. 6 (barley leaf stripe), revised as Working Sheet No. 6 (2. ed) in 1984 (Rennie and Tomlin, 1984), and Working Sheet S. 3. No. 7 (barley net blotch) (ISTA, 1964b). The osmotic method was invented by Joëlson in the 1980s (Joëlson, 1983). He found that by using a method that is not based on morphological characteristics, costs were lowered as staff input was reduced and throughput increased. With this method, seeds are incubated on filter paper moistened by a sugar solution. The osmotic pressure from the sugar inhibits the germination of the seeds (giving the method its name). The method is based on the ability of Pyrenophora spp. to produce brick-red pigments (anthraquinones) on the filter paper by incubation of seeds under certain conditions (correct temperature, bright light and adequate moisture). However, the method cannot distinguish between P. teres and P. graminea because they produce the same pigment – catenarin (Engström et al., 1993). The pigments turn from brick-red to violet when a weak solution of NaOH is added.

During the 1990s, a Nordic working group on seed pathology organized meetings and comparative tests to harmonize procedures and performance of the osmotic method for detection of P. graminea/P. teres in barley seed (Brodal et al., 1994; Brodal, 1995). In 1994–1995, a comparative test with the osmotic method was organized by a sub-working group of the ISTA Plant Disease Committee (Brodal, 1997).

Validation studies

Copies are available by e-mail from ista.office@ista.ch or by mail from the ISTA Secretariat.

**Safety precautions**

Ensure that you are familiar with hazard data and take appropriate safety precautions. It is assumed that this procedure is being carried out in a laboratory by persons familiar with the principles of Good Laboratory Practice. Dispose of all waste materials in an appropriate way (e.g. autoclaving or disinfection) and in accordance with local health, environmental and safety regulations.

**Treated seed**

This method has not been validated for the determination of *Pyrenophora teres* or *P. graminea* on treated seed. Seed treatments may affect the performance of the method. (Definition of treatment: any process, physical, biological or chemical, to which a seed lot is subjected, including seed coatings. See 7.2.3)

**Sample size**

The total number of seeds to be tested depends on the desired tolerance standard (maximum acceptable percentage of seeds infected).

**Materials**

**Reference material:** infected seeds of *Pyrenophora* spp. with a known infection level.

**Filter paper:** Munktell Quality 1731, size 162 mm in diameter (for 50 seeds) or filter paper of a corresponding quality. For 100 seeds, a larger size is needed.

**Sugar:** ordinary table sugar, as used for human consumption.

**Plastic plates:** with transparent tightly-fitting tops.

**1% NaOH:** the exact concentration is not critical.

**Impression tool:** equipment that can press 50 or 100 wells (indentations) of approximately 3 mm depth in moist filter paper.

**Oven:** capable of operating at 90 ± 5 °C.

**Incubator:** capable of operating at 22 ± 2 °C during the dark phase and at 26 ± 2 °C during the light phase.

**Fluorescent lamp:** daylight lamp capable of an illumination of at least 4000 lux (CCP).

**Sample preparation**

The test is carried out on a working sample as described in section 7.4.1 of the International Rules for Seed Testing.

**Method**

**Pretreatment**

1. Place the seeds in open trays or dishes in a thin layer and heat for 2 hours in an oven at 90 °C to reduce the growth of saprophytes.

**Preparation of substrate**

2. Quickly dip the filter paper in the sugar solution (170 g sugar per litre) and drain off surplus solution.
3. Punch 50 or 100 hollows in the filter paper.
4. Put the punched filter paper in a plate with a tight-fitting transparent lid.
**Plating and incubation**

5. The seeds are placed on the paper, one seed per well, by hand or by vacuum counter (if available)

6. Incubate samples for 7 days with alternating bright light (at least 4000 lux) for 16 hours at 26 ± 2 °C and darkness for 8 hours at 22 ± 2 °C.

7. A control sample of seed with known infection must be incubated under the same conditions as the test samples or other suitable control.

**Examination**

8. Remove the seeds and pour 1% NaOH solution onto the filter paper. Approximately 15 mL is used for a paper with 50 wells, and double that amount for a paper with 100 wells. The brick-red pigment will immediately change colour to violet. Count the violet-coloured pigmented spots under a magnifying lamp. Very faint spots (i.e. smaller spots with no distinct violet colour) should not be recorded (Figs. 1-3).

**General methods (common to many test procedures)**

1. Checking tolerances

   Tolerances provide a means of assessing whether or not the variation in result within or between tests is sufficiently wide as to raise doubts about the accuracy of the results. Suitable tolerances, which can be applied to most direct seed health tests, can be found in Tables 5B of Chapter 5 of the ISTA Rules, or in the *Handbook of Tolerances and Measures of Precision for Seed Testing* by S.R. Miles (*Proceedings of the International Seed Testing Association* 28 (1963) No 3, p 644).

2. Reporting results

   The result of a seed health test should indicate the scientific name of the pathogen detected and the test method used. When reported on an ISTA Certificate, results are entered under “Other Determinations”. In the case of a negative result (pathogen not detected), the results should be reported in terms of the tolerance standard. The tolerance standard depends on the total number of seeds tested \((n)\) and is approximately \(3/n\) \((p = 0.95)\) (see Roberts *et al.*, 1993). In the case of a positive result, the report should indicate the percentage of infected seeds.

**Quality assurance**

This test should only be performed by persons who have been trained in the method or under direct supervision of someone who has.

**Critical control points**

[Identified in the methods by CCP]

– It is essential that the lamps provide at least 4000 lux.

**Preparation of chemicals**

**Preparation of sugar solution:**

Dissolve 170 g of table sugar (sucrose) in 1 L de-ionized or tap water. Distilled water is not suitable, due to some hydrolysis of the sugar, which leads to acidification.

The sugar solution should not be stored for more than one week, and the temperature during storage should not exceed 25 °C. If there is any suspicion of growth of microorganisms, the sugar solution must not be used.
Preparation of sodium hydroxide:

Dissolve 10 g NaOH pellets in 1 L of tap water.

References

plantesjukdommer og frøpatologiske undersøkelser [Seed-borne diseases and
seed pathological investigations]. Nordic Council of Ministers, Copenhagen,

on barley seed compared with the freezing bloter method. In: Abstracts 24th ISTA
Congress Seed Symposium, Copenhagen, Denmark, June 7-16, 1995, p 24.

Drechslera spp. in Barley Seeds. In Seed Health Testing – Progress Towards the
21st Century, (eds J.D. Hutchins and J.C. Reeves), pp. 211-218, CAB International,
Wallingford, UK.

Anthraquinones from some Drechslera species and Bipolaris sorokiniana.
Mycological Research, 97, 381-384.

Handbook on Seed Health Testing. International Seed Testing Association,
Bassersdorf, Switzerland.

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Bassersdorf, Switzerland.

Joélson, G. (1983). The osmotic method - a method for rapid determination of seed-
International Seed Testing Association, Zürich, 9 pp.


Working sheet No. 6 (2. ed.). ISTA Handbok on Seed Health Testing. Section 2

Interpretation of seed health assays. In: Sheppard, J.W. (Ed.) Proceedings of the
1st ISTA Plant Disease Committee Symposium on Seed Health Testing, Ottawa,

method for detection of Pyrenophora teres (Drechslera teres) and P. graminea
(D. graminea) on Hordeum vulgare. ISTA Method Validation Reports 2011.
International Seed Testing Association, Bassersdorf, Switzerland.

Figure 1. A dish after seed incubation.
Figure 2. A dish after removal of incubated seeds, before addition of NaOH solution.

Figure 3. Enlargement of spots visible on the blotters after addition of NaOH solution. Faint spots not to be recorded (above) and normal spots to be recorded (below).

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Chapter 9: Determination of Moisture Content

C.9.1. Correction to 9.2.2.7

There is an error in 9.2.2.7 Reporting of moisture meter results where the second line of the current rule states:
The method must be reported (duration and temperature).
This is incorrect for moisture meters, where it only needs to be stated that a moisture meter was used.
This rules change proposal will require a change in the wording in 1.5.2.11 Moisture Content.

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<td>9.2.2.7 Reporting of moisture meter results</td>
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<td>The result of a moisture content test must be reported in the space provided to the nearest 0.1%.</td>
<td>The result of a moisture content test must be reported in the space provided to the nearest 0.1%.</td>
</tr>
<tr>
<td>The following additional information must also be reported under ‘Other Determinations’:</td>
<td>The following additional information must also be reported under ‘Other Determinations’:</td>
</tr>
<tr>
<td>– If germinating seeds ....</td>
<td>– The following statement must be entered: “A moisture meter was used.”</td>
</tr>
<tr>
<td></td>
<td>– If germinating seeds ...</td>
</tr>
</tbody>
</table>

Vote to accept item | Yes votes | No votes | Result
---|---|---|---
C.9.1 | | | accepted
C.9.2 Correction to 1.5.2.11 Moisture content

New text for 1.5.2.11 if proposal C.9.1 is accepted

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| **1.5.2.11 Moisture content**  
This Rule is applicable to both the oven method (9.1.7) and the moisture meter method (9.2.2.7).  
The result of a moisture content test must be reported in the space provided to the nearest 0.1%.  
The method must be reported (duration and temperature).  
The following additional information must also be reported under ‘Other Determinations’:  
  … | **1.5.2.11 Moisture content**  
This Rule is applicable to both the oven method (9.1.7) and the moisture meter method (9.2.2.7).  
The result of a moisture content test must be reported in the space provided to the nearest 0.1%.  
The following additional information must also be reported under ‘Other Determinations’:  
  – For the oven method (9.1.7), the method (i.e. duration and temperature) must be reported.  
  – For the moisture meter method (9.2.2.7), the statement: “A moisture meter was used”, must be entered.  
  … |

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Chapter 11: Testing Coated Seeds

C.11.1. Merging of Chapter 11 with Annex to Chapter 11

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<td>11.2.5 Procedures</td>
<td>11.2.5 Procedures</td>
</tr>
<tr>
<td>11.2.5.1 Procedures for sampling a seed lot</td>
<td>11.2.5.1 Procedures for sampling a seed lot</td>
</tr>
<tr>
<td>11.2.5.4 Procedures</td>
<td>11.2.5.1.2 Sampling intensity</td>
</tr>
<tr>
<td>11.2.5.1.4 Procedures for sampling a seed lot</td>
<td>Sampling the lot of seed pellets …</td>
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<tr>
<td>11.2.5.1.2.4 Sampling intensity:</td>
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<td>Sampling the lot of seed pellets …</td>
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<td>11.2.5.3.1.3–1.6 Drawing and disposal of submitted sample</td>
<td>11.2.5.3.1.6 Drawing and disposal of submitted sample</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>11.2.5.2 Procedure for obtaining the working sample</td>
<td>11.2.5.2 Procedure for obtaining the working sample</td>
</tr>
<tr>
<td>For pelleted seeds use one of the dividers described in 2.5.2.2.1. However, the distance of fall must never exceed that indicated in 11.2.5.2.A. For seed tapes take pieces of tape at random, to provide sufficient seeds for the test.</td>
<td>For pelleted seeds use one of the dividers described in 2.5.2.2.1. However, the distance of fall must never exceed 250 mm. For seed tapes take pieces of tape at random, to provide sufficient seeds for the test.</td>
</tr>
<tr>
<td>11.2.5.2.1 Minimum size of working sample</td>
<td>11.2.5.2.1 Minimum size of working sample</td>
</tr>
<tr>
<td>…</td>
<td>…</td>
</tr>
<tr>
<td>11.2.5.4 Conditions for issuing Orange International Seed Lot Certificates</td>
<td>11.2.5.4. Conditions for issuing Orange International Seed Lot Certificates</td>
</tr>
<tr>
<td>11.2.5.4.1 Seed lot size</td>
<td>11.2.5.4.1 Seed lot size</td>
</tr>
<tr>
<td>Providing there is satisfactory evidence that the lot is reasonably homogeneous, the maximum weight of lot may be as great as the maximum weight of lot for which sampling procedures are prescribed in Chapter 2, subject to the tolerance of 5% and subject to the seed number limitation prescribed in 11.2.5.4.1.A.</td>
<td>Providing there is satisfactory evidence that the lot is reasonably homogeneous, the maximum weight of lot may be as great as the maximum weight of lot for which sampling procedures are prescribed in Chapter 2, subject to the tolerance of 5%.</td>
</tr>
<tr>
<td>11.2.5.4.1.4 Size of lot</td>
<td>The maximum number of seeds that a lot of seed pellets, encrusted seeds, seed granules, seed tapes or seed mats may contain is 1 000 000 000 (10 000 units of 100 000), except that the weight of the lot, including the coating material, may not exceed 42 000 kg (40 000 kg plus 5%). When lot size is expressed in units, the total weight of the lot must be given on the certificate.</td>
</tr>
</tbody>
</table>

Approved by ECOM Decision No. 648 and 656 / Ordinary Meeting approved on June 14, 2012
### 11.2.5.4.4 Submitted sample

Submitted samples shall contain not less than the number of pellets or seeds indicated in column 2 of Table 11A, Part 1 and Part 2. If a smaller sample is used the following statement must be inserted on the certificate: “The sample submitted contained only .... pellets (seeds) and is not in accordance with the International Rules for Seed Testing.”

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
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<td><strong>11.2.5.4.4 Submitted sample</strong></td>
<td><strong>11.2.5.4.4 Submitted sample</strong></td>
</tr>
<tr>
<td>Submitted samples shall contain not less than the number of pellets or seeds indicated in column 2 of Table 11A, Part 1 and Part 2. If a smaller sample is used the following statement must be inserted on the certificate: “The sample submitted contained only .... pellets (seeds) and is not in accordance with the International Rules for Seed Testing.”</td>
<td>Submitted samples shall contain not less than the number of pellets or seeds indicated in column 2 of Tables 11A and 11B. If a smaller sample is used the following statement must be inserted on the certificate: “The sample submitted contained only .... pellets (seeds) and is not in accordance with the International Rules for Seed Testing.”</td>
</tr>
</tbody>
</table>

Table 11A Part 1. Sample sizes of pelleted seeds in number of pellets

| Table 11A Part 1. Sample sizes of pelleted seeds in number of pellets | Table 11A. Sample sizes of pelleted seeds in number of pellets |

Table 11A Part 2. Sample sizes of seed tapes

| Table 11A Part 2. Sample sizes of seed tapes | Table 11B. Sample sizes of seed tapes |

### 11.3 Purity analysis

#### 11.3.1 Object

A purity analysis in the strict sense (i.e. of the seeds inside the pellets and tapes) is not obligatory though, if requested by the applicant, a purity analysis on depelleted seeds or seed removed from tape may be carried out in accordance with Chapter 3 of the International Rules for Seed Testing (see also 11.3.5.A). Separations for pelleted seed are defined in 11.3.2 but for taped seed no separation is made.

#### 11.3.4 Verification of species

In order to check that the seed in the pellets is largely of the species stated by the applicant, it is obligatory to remove the pelleting material from 100 pellets taken from the pure pellet fraction of the purity test and determine the species of each seed. The pelleting material may be washed off or removed in the dry state. Similarly 100 seeds must be removed from tapes and the identity of each seed determined.

#### 11.3.5 Procedure

... For taped seed, depending on the material the tape is made of, strip off or dissolve away the tape so that 100 seeds can be examined. When the seeds in the tape are also pelleted, remove the pelleting material as indicated above.

<table>
<thead>
<tr>
<th>11.3.5</th>
<th>11.3.5</th>
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</thead>
<tbody>
<tr>
<td><strong>11.3.5.4 Procedure for verification of species</strong></td>
<td><strong>11.3.5.4 Procedures for purity tests on depelleted seeds and seeds removed from tapes</strong></td>
</tr>
<tr>
<td>The pelleting material may be washed off or removed in the dry state. For taped seed, depending on the material the tape is made of, strip off or dissolve away the tape so that 100 seeds can be examined. When the seeds in the tape are also pelleted, remove the pelleting material as indicated above.</td>
<td>For taped seed, depending on the material the tape is made of, strip off or dissolve away the tape so that 100 seeds can be examined. When the seeds in the tape are also pelleted, remove the pelleting material as indicated above.</td>
</tr>
</tbody>
</table>

<table>
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<th>11.3.5.3</th>
<th>11.3.5.3</th>
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<tbody>
<tr>
<td><strong>11.3.5.3 Procedures for purity tests on depelleted seeds and seeds removed from tapes</strong></td>
<td><strong>11.3.5.3 Procedures for purity tests on depelleted seeds and seeds removed from tapes</strong></td>
</tr>
</tbody>
</table>
### 11.5.4 Materials

Paper, sand and in certain situations soil are permissible as substrates. For pelleted seed the use of pleated paper, and for seed tapes a between paper method of which the upright rolled towel has proved satisfactory in many cases, is recommended.

### 11.5.4 Growing media

The pleated paper recommended for tests on pellets has a weight of 100 to 120 g/m² and a water absorption of 220–240%. The pleated filter papers are enveloped by cover strips, of a weight of 70 g/m² and a water absorption of 220–240%.

### 11.5.6 Procedure

#### 11.5.6.2 Test conditions

- **Moisture and aeration**

<table>
<thead>
<tr>
<th>Vote to accept item</th>
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<th>Result</th>
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<tbody>
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<td>accepted</td>
</tr>
</tbody>
</table>
Chapter 15: Seed Vigour Testing

C.15.1. Addition of a new vigour method

The results of the radicle emergence (RE) test for *Zea mays* have been related to field emergence and seedling size. Comparative tests (see Method Validation report) have established the repeatability and reproducibility of the RE test for *Zea mays* and the test is therefore proposed as an addition to Chapter 15 Seed Vigour Testing. This proposal originates from and is supported by the Vigour Committee.

Note: if accepted Chapter 1 will need to be amended to include the reporting instruction for this new method.

---

**NOTE:** To make reading easier although this is new text it has not been made blue or underlined.

15.8 Detailed Methods

15.8.4 Radicle emergence (RE) test for *Zea mays*

15.8.4.1. Principle

A slower rate of germination is an early physiological expression of seed ageing, the major cause of reduced vigour. The rate of germination of *Zea mays* is accurately reflected in a single count of radicle emergence early in germination and this single count relates closely to other expressions of the rate of germination. High counts of radicle emergence early in germination are indicative of high seed vigour; low counts indicate low seed vigour.

15.8.4.2 Scope

The RE test provides a vigour test for *Zea mays* which relates to field emergence.

15.8.4.3 Apparatus

**Paper towels:** as used in a germination test (Chapter 5.4.3.1).

**Plastic bags or containers:** to prevent towels drying out during the test.

**Germination test facilities:** to maintain a temperature of 20 ± 1°C or 13 ± 1°C.

15.8.4.4. Radicle emergence test procedure

15.8.4.4.1 Setting up the radicle emergence test

Set eight replicates of 25 seeds to germinate on paper towels, following the normal procedure for a rolled towel germination test in your laboratory. The seed should be placed on the papers with the embryo radicle pointing to the bottom of the paper. Two rows of seed are suggested to assist counting, one of 12 and one of 13 seeds. The towels must be rolled up and placed upright in plastic bags or containers to prevent them drying out. Place the seeds at the required temperature. A control seed lot must be included with each test.

15.8.4.4.2 Temperature for the test

The radicle emergence test may be conducted either at 20 ± 1°C or at 13 ± 1°C. Temperature is the most important potential variable in the test. Monitoring of temperature is desirable and rotation of seed lots and replicates is advised at time intervals of 24h. It is also advisable to limit the area over which tests are distributed in the incubation room/incubator in which the test is conducted.

15.8.4.4.3 Timing of radicle emergence counts

The timing of radicle emergence counts depends on the testing temperature. At 20°C: count at 66 hours ± 15 minutes after the test has been set up. The test should be set up to achieve these counts at a reasonable time of day, for example, if the test is set up at 16.00 the count will occur at 10.00 three days later. At 13°C: count after 144 hours ± 1 hour (i.e. 6 days ± 1 hour). The test should be set up at a time of day convenient for making the subsequent radicle emergence counts.

15.8.4.5 Calculation and expression of results
The number of seeds that have produced a radicle at least 2 mm long is recorded for each replicate. A clear and obvious radicle is a quick and uniform method of assessment, with a radicle length of 2 mm being judged by eye.

The number of seeds showing radicle emergence in each replicate is converted into a percentage for each replicate.

Calculate the average radicle emergence percentage according to Chapter 5 by combining four of the 25-seed replicates to one 100-seed replicate. If the two 100-seed replicates differ by more than the maximum tolerance value for radicle emergence shown in Table 15H, the seed lot must be re-tested. If the second test result is compatible with the first (i.e. the difference does not exceed the tolerance indicated in Table 15I), the average of the two tests must be reported.

15.8.4.6 Reporting results
When reported on an ISTA International Seed Analysis Certificate, results are entered under ‘Other Determinations’.
- Results are expressed as a percentage with emerged radicles calculated to the nearest whole number (5.8.1). If the result is found to be nil, it must be entered as ‘0’.
- The results must be accompanied by a statement of the temperature used for the test and the time of the radicle emergence counts in hours.
  e.g. Radicle emergence test
  90% with emerged radicles after 66h at 20°C

New Tolerance tables
Table 15H. Tolerances between highest and lowest radicle emergence of two replicates of 100 seeds in one radicle emergence test (two-way test at the 2.5% significance level). Note: this table is a copy of Table 5B Part 2.

<table>
<thead>
<tr>
<th>Average radicle emergence of test</th>
<th>Tolerance</th>
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<td>0–50%</td>
</tr>
<tr>
<td>99</td>
<td>2</td>
</tr>
<tr>
<td>98</td>
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<td>96–97</td>
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<td>47–50</td>
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Table 15I. Tolerances between results of two radicle emergence tests of 200 seeds on the same or a different submitted sample when tests are made in the same laboratory (two-way test at the 2.5% significance level). Note: this table is a copy of Table 5C Part 2.

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<td>0–50%</td>
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<tr>
<td>99</td>
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### C.15.2. Required changes to 1.5.2.16.4 if C.15.1 is accepted

**New text for 1.5.2.16.4 if proposal C.15.1 is accepted**

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<td>The result of a seed vigour test using the radicle emergence test method must be reported under ‘Other determinations’ as follows:</td>
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<td></td>
<td>– Results are expressed as a percentage of seeds with emerged radicles calculated to the nearest whole number (5.8.1). If the result is found to be nil, it must be entered as ‘0’.</td>
</tr>
<tr>
<td></td>
<td>– The results must be accompanied by a statement of the temperature used for the test and the time of the radicle emergence counts in hours.</td>
</tr>
<tr>
<td></td>
<td>e.g. Radicle emergence test 90% with emerged radicles after 66h at 20°C</td>
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C.15.3. Change to the list of validated tests: modification of Table 15A

Addition of Radicle emergence test: *Zea mays*

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<td><em>Pisum sativum</em> (garden pea only, excluding petit-pois varieties)</td>
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<tr>
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<td><em>Phaseolus vulgaris</em></td>
</tr>
<tr>
<td></td>
<td><em>Glycine max</em></td>
</tr>
<tr>
<td>Accelerated ageing</td>
<td><em>Glycine max</em></td>
</tr>
<tr>
<td>Controlled deterioration</td>
<td><em>Brassica spp.</em></td>
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### PROPOSED VERSION

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<td><em>Pisum sativum</em> (garden pea only, excluding petit-pois varieties)</td>
</tr>
<tr>
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<td><em>Phaseolus vulgaris</em></td>
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<td></td>
<td><em>Glycine max</em></td>
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<tr>
<td>Accelerated ageing</td>
<td><em>Glycine max</em></td>
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<tr>
<td>Controlled deterioration</td>
<td><em>Brassica spp.</em></td>
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<tr>
<td>Radicle emergence test</td>
<td><em>Zea mays</em></td>
</tr>
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</table>

**Vote to accept item**

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Chapter 18: New Chapter on Seed Mixtures

C.18.1. New Chapter 18: Testing Seed Mixtures

This is being added as a new testing Chapter to the ISTA Rules. The provision of ISTA methods to allow testing and reporting of results for mixtures of seed on ISTA certificates has been requested by ISTA stakeholders. Reporting is restricted to the Blue International Certificate.

NOTE: To make reading easier although this is new text it has not been made blue or underlined.

Chapter 18: Testing Seed Mixtures
18.1 Object
The object of tests on seed mixtures is to gain information regarding the quality of seed samples containing seed of more than one species. When specific instructions are not given in this Chapter, then the appropriate Chapter must be followed. On request of the customer, the following tests can be conducted on seed mixtures:
− component analysis;
− purity analysis;
− other seed determination;
− germination;
− weight determination.

In a seed mixture the component species will usually be seed of a species listed in Table 2A (Lot and sample weights) of the ISTA Rules but this may not always be the case. The results of tests on seed mixture samples can only be reported on a Blue International Seed Sample Certificate (see 1.5.2.19, 1.2.2 and 18.8), and under the entry for species tested ‘Seed mixture’ is shown.

18.2 Definitions
Seed mixture sample is a quantity of seed that is physically and uniquely identifiable and is by purpose expected to include seed of two or more species. Mixture component seed of a species that is declared to be contained in a seed mixture sample. Inert matter, e.g. additives to improve sowability, can be regarded as mixture components if declared as such. Coated seed can be a component of seed mixtures.

18.3 Sampling
18.3.1 Submitted sample
The size of the submitted sample must be of sufficient size to carry out the analysis requested. A sample with a size equal to the minimum submitted sample size of the component with the greatest minimum submitted sample size (Column 3 of Table 2A) will meet this requirement.

18.3.2 Sample reduction
For reduction of seed mixture samples, the methods listed in 2.5.2.2 may be used. The hand halving method or the spoon method may be used if the hand halving or the spoon method is allowed for at least one of the components in the mixture.
18.4 Purity analysis

18.4.1 Component species
In a seed mixture, when the component species are stated by the applicant all other species found are considered as impurities the pure seed of each species stated by the applicant to be part of that mixture is considered to be a component species. Where there is no declaration of species by the applicant, all species found at a level of more than 5.0% or more must be considered to be component species. The pure seed assessment must follow the appropriate pure seed definition (PSD) of each species (Chapter 3).

18.4.2 Working sample
The purity analysis must be made on a working sample taken from the submitted sample in accordance with 2.5.2. The size of the working sample must be:

- either a weight estimated to contain at least 2500 seed units based on the declared mixture composition (option A);
- or not less than the minimum working sample weight (according to Table 2A column 4, Purity analysis 3.5.1) of the component species in the mixture with the greatest minimum working sample weight (according to Table 2A column 4, Purity analysis 3.5.1) (option B).

18.4.2.1 Option A: must be used when the mixture components are declared when mixture composition is declared
To calculate the working sample size on the basis of the assumed weights of 2500 seeds of each species, as given under ‘Minimum working sample weights for purity analysis’ (column 4) of Table 2A, the following formula is used:

\[
Purity\ working\ sample\ weight\ for\ mixture = \frac{100}{(\%C_1/PWC_1 + \%C_2/PWC_2 + \%C_3/PWC_3 + \%C_4/PWC_4 + \ldots)}
\]

where:
- \(\%C_x\) = declared percentage of the component ‘x’ in the mixture;
- \(PWC_x\) = minimum purity working sample weight of component ‘x’ as given in Table 2A.

The following example illustrates the use of the formula (see Table 18A):

```
Working sample weight for mixture:
= 100 / (%C_1/PWC_1 + %C_2/PWC_2 + %C_3/PWC_3 + %C_4/PWC_4 + …)
= 100 / (30/5 + 30/3 + 30/6 + 10/1)
= 100 / (6+10+5+10)
= 100 / 31
= 3.226 g
```

Therefore, the weight of each component within the calculated working sample weight of 3.226 g depends on the declared component percentage. For example, if the component is 30%, the weight of that species is 3.226g multiplied by 0.3 = 0.9677g
Table 18A. Calculation example of working sample size according to component percentage (option A)

<table>
<thead>
<tr>
<th>Species</th>
<th>Component percentage as declared (%)</th>
<th>Minimum weight of purity working sample (Table 2A) (g)</th>
<th>Calculated weight of each species in the sample (g)</th>
<th>Calculated number of each species in the sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 Festuca arundinacea</td>
<td>30</td>
<td>5</td>
<td>0.9677</td>
<td>484</td>
</tr>
<tr>
<td>C2 Festuca rubra</td>
<td>30</td>
<td>3</td>
<td>0.9677</td>
<td>807</td>
</tr>
<tr>
<td>C3 Lolium perenne</td>
<td>30</td>
<td>6</td>
<td>0.9677</td>
<td>403</td>
</tr>
<tr>
<td>C4 Poa pratensis</td>
<td>10</td>
<td>1</td>
<td>0.3226</td>
<td>807</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>3.226</strong></td>
<td></td>
<td><strong>2501</strong></td>
</tr>
</tbody>
</table>

18.4.2.2 Option B: must be used when mixture components are sition is not declared
When the component percentages of a mixture have not been declared, the minimum working sample weight of the mixture must be not less than the minimum working sample weight (according to Table 2A column 4, Purity analysis 3.5.1) of the component species with the greatest minimum working sample weight (according to Table 2A column 4, Purity analysis 3.5.1), or a weight estimated to contain 2500 seeds. For example, in a mixture, four component species are identified and their minimum working sample weights taken from Table 2A, column 4, Purity analysis 3.5.1, as follows:

- Festuca arundinacea: 5 g
- Festuca rubra: 3 g
- Lolium perenne: 6 g
- Poa pratensis: 1 g

In this example, since Lolium perenne has the greatest working sample weight requirement of 6 g, the required minimum working sample weight of the mixture will also be 6 g.

18.4.3 Pure seed
The pure seed must refer to the species stated by the applicant (Option A), or seed of species found in the test to be present at a level of more than 5% or more (Option B) and must include all botanical varieties and cultivars of that species. The pure seed must be separated into the component species, and each component species must be weighed in grams to the minimum number of decimal places necessary to calculate the percentage to one decimal place (3.5.1).

18.4.4 Separation
The uniform blowing method must not be used for species components of seed mixtures, but the blower can be used as a precleaning tool to aid the purity analysis.

18.5 Determination of other seeds by number

18.5.1 Working sample
The size of the working sample must be ten times the size of the purity working sample determined according to 18.4.2.
18.6 Germination test
18.6.1 Working sample
For species representing more than 5% of the seed mixture, four replicates of 100 seeds are planted from the pure seed of each component species. If sufficient seeds are not available from the pure seed fraction to test four replicates of 100 seeds, the test will be carried out on, by order of priority, two replicates of 100 seeds; one replicate of 100 seeds or on the all of the pure seed of the species in the pure seed fraction, depending on the availability of the seeds.

For species representing 5% or less of the mixture, germination testing is not carried out except on the specific request of the customer. When such a request is made the germination is carried out on two replicates of 100 seeds, one replicate of 100 seeds, or on the all of the pure seed of the species in the pure seed fraction, depending on the availability of the seeds.

18.7 Weight determination
The thousand-seed weight is determined by counting the number and determining the weight of each seed component in the purity sample, rather than counting replicates as in 10.5.3.
18.7.1 Calculation and expression of results
The thousand-seed weight is calculated using the weight and number of seeds of each component, as follows:

\[
\text{Thousand-seed weight} = \frac{\text{Weight of seeds in purity sample}}{\text{Number of seeds in purity sample}} \times 1000
\]

Table 18B gives an example.

**Table 18B. Calculation of thousand-seed weights of a seed mixture**

<table>
<thead>
<tr>
<th>Species</th>
<th>Weight of seeds in purity sample (g)</th>
<th>Number of seeds in purity sample</th>
<th>Calculation</th>
<th>Thousand-seed weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Festuca arundinacea</td>
<td>0.9677</td>
<td>484</td>
<td>( \frac{0.9677}{484} \times 1000 = 2.00 )</td>
<td></td>
</tr>
<tr>
<td>Festuca rubra</td>
<td>0.9677</td>
<td>806</td>
<td>( \frac{0.9677}{806} \times 1000 = 1.20 )</td>
<td></td>
</tr>
<tr>
<td>Lolium perenne</td>
<td>0.9677</td>
<td>403</td>
<td>( \frac{0.9677}{403} \times 1000 = 2.40 )</td>
<td></td>
</tr>
<tr>
<td>Poa pratensis</td>
<td>0.3226</td>
<td>806</td>
<td>( \frac{0.3226}{806} \times 1000 = 0.40 )</td>
<td></td>
</tr>
</tbody>
</table>

18.8 Reporting results
The results of tests on seed mixtures can only be reported on a Blue International Seed Sample Certificate (see 1.2.2).

For the species tested ‘Seed mixture’ must be entered.

The actual weight of seeds examined to the minimum number of decimal places indicated in Table 4.1 must be reported under ‘Other determinations’ i.e. ‘Seed mixture test ….g of seed examined.’

18.8.1 Purity
The percentage by weight of pure seed, inert matter and other seeds must be given to one decimal place. In the case of a seed mixture, the pure seed percentage must be calculated using the total weight of the pure seed of all component species. The percentage by weight of the pure seed of each component species must be included under ‘Other determinations’. If the percentage by weight is below 0.05%, it must be stated as ‘TR’ (for ‘Trace’). If no inert matter or other seeds are found, this must be entered as ‘0.0’. The scientific name must be used for every species of other species found in the purity test.

18.8.2 Determination of other seeds by number
The results of a determination of other seeds by number on a seed mixture must be reported as in 4.7.

18.8.3 Germination
The germination results for each component species must be reported under ‘Other determinations’. No germination results are reported in the ‘Germination’ section of a certificate, and a hyphen or minus sign (–) must be entered. The results of the germination test for each component tested are reported to the nearest whole number under the categories normal seedlings, hard seed, fresh seed, abnormal seedlings and dead seeds. When 400, 200 or 100 seeds are tested, the results are reported as a percentage, and the number of seeds tested is also reported. Tolerances as described in 5.8.1 are applied to 400; 200 and 100 seed tests.

When less than 100 seeds are tested, the actual number of seeds in each category is reported, together with the total number of seeds tested.

The germination method used for all the component species must be reported on the certificate.

18.8.4 Weight determination
The method used (‘counting the number of seed of each component in the pure seed fraction of the purity test’), and the result as calculated according to 18.7.1, must be reported under ‘Other determinations’.

In view of the number of changes to the this proposal, Steve Jones asked for a motion from the floor to go ahead with voting. The motion was made and seconded, and the proposal was voted on and accepted.

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
<th>No votes</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.18.1</td>
<td></td>
<td>3</td>
<td>accepted</td>
</tr>
</tbody>
</table>
C.18.2. Required change to 1.3b if C18.1 is accepted

Existing 1.3b must be amended if proposal 18.1 is accepted as ISTA Rules would then have methods for mixtures.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3 Conditions for issuance of ISTA Certificates</td>
<td>1.3 Conditions for issuance of ISTA Certificates</td>
</tr>
<tr>
<td>…..</td>
<td>…..</td>
</tr>
<tr>
<td>b) The seed tested must be of a species listed in Table 2A (Lot and sample weights) of the ISTA Rules. Where in other tables, such as Table 5A and Table 6A, methods are prescribed for a group of species, only those species specifically listed in Table 2A shall be considered to be covered. Consequently, no certificates may be issued for species not listed in Table 2A of the current ISTA Rules, nor for mixtures of species which are not in the ISTA Rules, as no procedures are prescribed for mixtures.</td>
<td>b) The seed tested must be of a species listed in Table 2A (Lot and sample weights) of the ISTA Rules. Where in other tables, such as Table 5A and Table 6A, methods are prescribed for a group of species, only those species specifically listed in Table 2A shall be considered to be covered. Consequently, no certificates may be issued for species not listed in Table 2A of the current ISTA Rules, except in the case of seed mixtures where for the species tested it is shown as 'Seed mixture'.</td>
</tr>
</tbody>
</table>

Vote to accept item | Yes votes | No votes | Result |
--- | --- | --- | --- |
C.18.2 | | 1 | accepted |

C.18.3. Required change to 1.5.2.19 if C18.1 is accepted

Existing 1.5.2.19 renumbered 1.5.2.20 and any cross references updated to allow insertion of new 1.5.2.19 for reporting of mixtures.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5.2.19 Reporting of results of tests not covered by the Rules</td>
<td>1.5.2.20 Reporting of results of tests not covered by the Rules</td>
</tr>
</tbody>
</table>

Vote to accept item | Yes votes | No votes | Result |
--- | --- | --- | --- |
C.18.3. | | 1 | accepted |
C.18.4. New 1.5.2.19 text if C18.1 is accepted

New text inserted at 1.4.1 and 1.5.2.19 if proposal C.18.1 is accepted. Existing 1.5.2.19 renumbered 1.5.2.20 and any cross references updated.

<table>
<thead>
<tr>
<th>CURRENT VERSION</th>
<th>PROPOSED VERSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4.1</td>
<td>c) The scientific name of the species tested, as listed in the current ISTA Rules and (in most cases) also the ISTA List of Stabilized Plant Names. Where it is impossible to determine the species with certainty on the basis of seed characters, only the genus name must be stated (example: <em>Malus</em> sp.). In the case of seed mixtures for the species tested “Seed mixture” must be entered.</td>
</tr>
</tbody>
</table>

**NEW 1.5.2.19**

1.5.2.19 Seed mixtures

The results of tests on seed mixtures can only be reported on a Blue International Seed Sample Certificate (see 1.2.2). For the species tested ‘Seed mixture’ must be entered.

The actual weight of seeds examined to the minimum number of decimal places indicated in Table 4.1 must be reported under ‘Other determinations’ i.e. ‘Seed mixture test …g of seed examined.’

1.5.2.19.1 Purity

The percentage by weight of pure seed, inert matter and other seeds must be given to one decimal place. In the case of a seed mixture, the pure seed percentage must be calculated using the total weight of the pure seed of all component species. The percentage by weight of the pure seed of each component species must be included under ‘Other determinations’. If the percentage by weight is below 0.05%, it must be stated as ‘TR’ (for ‘Trace’). If no inert matter or other seeds are found, this must be entered as ‘0 0’. The scientific name must be used for every species of other species found in the purity test.

1.5.2.19.2 Determination of other seeds by number

The results of a determination of other seeds by number on a seed mixture must...
### Minutes of the Ordinary Meeting 2011

#### Vote to accept item C.18.4

<table>
<thead>
<tr>
<th>Vote to accept item</th>
<th>Yes votes</th>
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<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>C.18.4</td>
<td></td>
<td>1</td>
<td>accepted</td>
</tr>
</tbody>
</table>

The President thanked all people involved in preparing these final Rules proposals for voting.

**Adoption of the Financial Auditors for Auditing the Accounts for 2011**

Before continuing to the next item on the Agenda, the President informed the Meeting that the appointment of the financial auditors for 2011 still remained to be decided, and gave the floor to the Secretary General. The Secretary General apologized for the omission and asked for the ECOM proposal to appoint the company BDO as auditors for the accounts for 2011 to be approved. There were no comments, and BDO was thus appointed by applause.

#### CURRENT VERSION

**be reported as in 4.7.**

1.5.2.19.3 Germination

The germination results for each component species must be reported under ‘Other determinations’. No germination results are reported in the ‘Germination’ section of a certificate, and a hyphen or minus sign (−) must be entered. The results of the germination test for each component tested are reported to the nearest whole number under the categories normal seedlings, hard seed, fresh seed, abnormal seedlings and dead seeds. When 400, 200 or 100 seeds are tested, the results are reported as a percentage, and the number of seeds tested is also reported. Tolerances as described in 5.8.1 are applied to 400, 200 and 100 seed tests.

When less than 100 seeds are tested, the actual number of seeds in each category is reported, together with the total number of seeds tested.

The germination method used for all the component species must be reported on the certificate.

1.5.2.19.4 Weight determination

The method used (‘counting the number of seed of each component in the pure seed fraction of the purity test’), and the result as calculated according to 18.7.1, must be reported under ‘Other determinations’.

#### PROPOSED VERSION

**be reported as in 4.7.**

1.5.2.19.3 Germination

The germination results for each component species must be reported under ‘Other determinations’. No germination results are reported in the ‘Germination’ section of a certificate, and a hyphen or minus sign (−) must be entered. The results of the germination test for each component tested are reported to the nearest whole number under the categories normal seedlings, hard seed, fresh seed, abnormal seedlings and dead seeds. When 400, 200 or 100 seeds are tested, the results are reported as a percentage, and the number of seeds tested is also reported. Tolerances as described in 5.8.1 are applied to 400, 200 and 100 seed tests.

When less than 100 seeds are tested, the actual number of seeds in each category is reported, together with the total number of seeds tested.

The germination method used for all the component species must be reported on the certificate.

1.5.2.19.4 Weight determination

The method used (‘counting the number of seed of each component in the pure seed fraction of the purity test’), and the result as calculated according to 18.7.1, must be reported under ‘Other determinations’.
10. Consideration and Adoption of the Reports of the Technical Committees

The Technical Committees’ work had been presented in the sessions held on 14 and 15 June. The relevant document ‘OM11-03 Activity Report 2010 of the ISTA Committees’ had been distributed to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organisations for information two months prior to the ISTA Ordinary Meeting as well as being published on the web site at least two months before the meeting.

The President asked each chairperson to come on stage, and to remain there after approval by applause.

Purity Committee: Jane Taylor, United Kingdom (Vice Chair)
Germination Committee: Sylvie Ducournau, France (Chair)
Moisture Committee: Craig McGill, New Zealand (Chair)
Tetrazolium Committee: Stefanie Krämer, Germany (Chair)
Vigour Committee: Alison Powell, United Kingdom (Chair)
Seed Health Committee: Theresa Aveling, South Africa (Chair)
Variety Committee: Berta Killermann, Germany (Chair)
GMO Committee: Christoph Haldemann, Switzerland (Chair)
Flower Seed Committee: Rita Zecchinelli, Italy (Chair)
Forest Tree and Shrub Seed Committee: Steve Jones, Canada (representing Fabio Gorian, Italy)
Editorial Board of Seed Science and Technology, Alison Powell, United Kingdom (Chair)
Bulking and Sampling Committee: Leena Pietilä, Finland (Chair)
Statistics Committee: Jean-Louis Laffont, France (Chair)
Nomenclature Committee: Steve Jones, Canada (representing John Wiersema, United States)
Seed Storage Committee: Alison Powell, United Kingdom (representing Hugh Pritchard, United Kingdom)
Proficiency Test Committee: Günter Müller, Germany (Chair)
Seed Analyst Training Committee: Alison Powell, United Kingdom (Chair)
Rules Committee: Steve Jones, Canada (Chair)

The President thanked again all the Committees for their important work during the year, leading to the adoption of very important Rules.
11. Announcement of the Place and Date of the next Ordinary Meeting

[DR-100_0206.mp3 00:49:30]

The President invited Joost van der Burg, Netherlands, to the stage to announce and present the venue of the next Annual Meeting.

Joost van der Burg (Netherlands):

“Good afternoon. I’m most happy to give this small presentation and a small film afterwards. You may be wondering why I put this old-fashioned windmill on the brochure. There are many reasons to visit Holland, including about 1000 windmills still present, but it also marks the beginning of an important era: around 1600 there was an invention in Holland of changing big logs into boards in an automatic way. Before, we built ships with hand-sawn planks, and we could only build a few ships a year. After this, we were able to build a few hundred per year and conquer parts of the world. With some reservations, we are still proud of this, but it also gave us the Golden Age, and people like Rembrandt and Vermeer also profited from the wealth of the Dutchmen in those days. It was a real industrial revolution, these windmills, and they were used for all kinds of purposes. It’s a matter of scaling up, which is also repeated several times in many industries, and our horticultural sector is scaling up year after year. Agriculture is present also on quite a large scale, and of course the well-known flower world. Unfortunately they will not be flowering during our Meeting, because in June they will be in fruit or cut. But there will be plenty of other flowers. This is also typical for our part of the world; the dairy industry is very important.

“The venue will be in the city of Venlo, which is not well known, but it’s very close to the German border. It’s along the river Maas, la Meuse in French, and it easily reached from Amsterdam airport by good train connections. The meeting we intend to hold on the Floriade, a big event organized every ten years, a world horticultural expo. We will be meeting in this building; you can just step out and walk through the park and visit the pavilions, so there will be free access to the fairground.

“The organizing Committee consists of Marcel Toonen from Naktuinbouw, Gerarda de Boer in our midst and her director Eric Casteleijn from NAK, Harry Nijenstijn, on behalf of the Dutch seed industry, and Lenie Brugging from the Ministry, and myself. We intend to have a few side events to make it more attractive also to come to Holland, maybe, but also to do some real work, and we intend to have a flower seed testing workshop, a variety testing workshop, and maybe even a seed health testing workshop. They will be in different places, but not on the fairground, most probably in the week before and the week after.

“We also hope that we can organize a seminar on the Monday, the traditional seminar, and the subject is under discussion, but my preference goes to new technologies, which may perhaps not be surprising. And we also hope to attract quite some exhibitors, so that we have a nice combination of presentations and the real thing at one place. We will be informing you shortly on the web site and other places about the event.

“So we will have the official presentation of the Floriade now, so you get an impression.”

[Film of the Floriade]

“So we are excited to receive you next year. You’re very welcome!”

The President thanked Joost for his presentation, and remarked on the quality of the presentation.

Eddie Goldschagg (South Africa) enquired about accommodation and the exact dates of the Meeting.
Joost van der Burg gave the dates as 11–14 June 2012, and that a number of hotels had been selected, and interesting prices negotiated. However these were not on the premises of the Meeting, and bus services would be organized. Registration would be from 1 October, 2011.

12. **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**

Secretary General announced that no such business had been received.

13. **Any other Business raised by consent of the Executive Committee**

The President announce that there was no such business.

14. **President’s closing address**

“Ladies and gentlemen, dear colleagues, we are now at the end of our meeting. It is now usual to have an Annual Meeting, and each year the Meetings have been very productive and very busy, with the internal and closed meetings gathering the Executive Committee and the Chairs of the Committees, which gave a better opportunity to share ideas and to build together the Association. The Association and the Meeting is also busy with the Seminar on Germination, which showed the importance of the basic tests and the great care of our Association to adapt to the needs of the seed sector, looking for flexibility, and keeping the rigour of the tests.

“We had also the meetings of the Technical Committees, showing that important questions have been addressed or are under significant progress, such as seed mixtures, statistical tools, sampling and check sampling, size vegetable seed lots, GMO method and proficiency tests, seed health methods etc.; you had all these points during this week.

“Again, the side meetings gave a very intensive week to all of you, and those meetings are very important. Now I would like again to thank all the people who have participated in this Meeting and organized it, and I would like to start with our Japanese colleagues, for the preparation of the Meeting, and for coming to Zurich as a delegation. Thank you very much.

“I would also like to thank all the Technical Committees, all the participants to this Meeting, the Executive Committee members, and, particularly for the organization of this Meeting in Zurich, the Secretary General, Michael Muschick, and his team for their excellent preparation of this Meeting, and I will invite all the colleagues from the Secretariat to come here in front in order to give our appreciation of what has been done.

“I would like to thank the Administration Department, under the leading of Patricia Muschick and with her team, Cannice Gubser and Nadine Ettel. I would like to thank the Accreditation Department, led by Rasha El-Khadem, and with her team Branislava Opr and Mary-Jane Kelly. All our thanks are also going to the Department for Technical Development, led by Christof Neuhaus with his team Jonathan Taylor and Agnes Hegedüs. And we have to thank also all the students who have contributed to the preparation of this Meeting: Stefania De Tomasi, Fabiène Bachmann, and Julia Punnacherry, for all the work they have done for preparing this Meeting, for running this Meeting, in a very good and professional way, I would like to thank them all together.”
The President also thanked the staff of the sound engineering company Krebser, and the staff of the Novotel.

He invited all participants to the Annual Meeting 2012 in Holland, wished everyone a safe journey home, and declared the Meeting adjourned.

15. **Adjournment**

The meeting was adjourned at 17:20.