



INTERNATIONAL SEED TESTING ASSOCIATION (ISTA)

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Directive ISTA Accreditation and Scope of Accreditation Policy

Note: Any copies of this document are not subject to change service

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Valid from: 01.01.2014			

SCOPE

The scope of this directive is to explain the accreditation procedure in detail. It provides information as to how a laboratory can generate its scope of accreditation. It clarifies for which tests a laboratory must be accredited to be able to obtain accreditation for other related tests. Information is also provided about how the scope of accreditation can be changed and how suspended or withdrawn tests can be reinstated and which influence this has on the laboratory's participation in the ISTA Proficiency Test Programme.

GENERAL CONDITIONS

Accreditation is defined as a procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks. These specific tasks are summarized under a laboratory's scope of accreditation. The scope of accreditation comprises testing and sampling methods for which a laboratory seeks accreditation.

In 2001 at the ISTA Congress in Angers it was decided that a laboratory can only be accredited for species and methods covered by the ISTA Rules. Accreditation cannot be granted for in-house methods or methods described in ISTA handbooks or other references only, e.g. cold test on maize. Since 2006, the Rules have had provisions for performance approved methods. In a specified field, laboratories may be eligible to attain accreditation for tests that are not standardised in the Rules.

Only ISTA accredited laboratories may issue ISTA certificates. The Certificates can be purchased only from the ISTA Secretariat. To issue ISTA Certificates the requirements as stated in the ISTA Accreditation Standard and the ISTA Rules must be followed.

RELATED DOCUMENTS

The Articles of the International Seed Testing Association (ISTA)

ISTA Seed Testing Laboratory Accreditation Standard, referred to as 'Accreditation Standard'

ISTA International Rules for Seed Testing, referred to as 'ISTA Rules'

Acc-D-01-Procedures for Termination, Suspension and Withdrawal of ISTA Accreditation

Acc-D-03-Appeals and Complaints Procedure

Acc-D-04-Principles and Conditions for Laboratory Accreditation under the Performance Based Approach

Acc-P-09-How to respond to audit findings

PT-P-01-ISTA Proficiency Test Programme

RESPONSIBILITY AND ABBREVIATIONS

BMP: Below Minimum Performance

GMO: Genetically Modified Organism

ISTA: International Seed Testing Association

PDE: Performance Data Evaluation

PT: Proficiency Test

DEFINITIONS

Accreditation: procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks.

Accreditation audit: first audit conducted to verify suitability of the quality management system and the laboratory's compliance with the ISTA Accreditation Standard.

Accreditation body: body that conducts and administers an accreditation system and grants accreditation.

Accredited test: Test covered by a laboratory's scope of accreditation

Audit: systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.

Audit evidence: records, statements of fact or other information which are relevant to the audit criteria and verifiable

Audit criteria: set of policies, procedures or requirements

Auditor/Assessor: person with competence to conduct an audit.

Authorisation: approval by the ISTA Executive Committee that an ISTA accredited laboratory may issue ISTA International Seed Analysis Certificates.

Crop group: Classification of species into groups with similar features as defined in the ISTA Proficiency Test Programme.

ISTA Laboratory Accreditation Standard: document approved by the ISTA Executive Committee where requirements of the quality management system are laid down. Seed testing laboratories are assessed against this standard. The ISTA Rules are an integral part of the ISTA Laboratory Accreditation Standard. In the following the ISTA Laboratory Accreditation Standard will be referred to as 'Accreditation Standard'.

ISTA International Rules for Seed Testing: published by the Association and referred to as 'ISTA Rules'.

On-site assessment/on-site audit: part of the audit conducted by an ISTA audit team to verify compliance of the current quality management system with the requirements of the ISTA Laboratory Accreditation Standard which takes place in the premises of the laboratory.

Proficiency Test Programme: determination of laboratory testing performance by means of inter-laboratory comparisons.

Quality Manual: document specifying the quality management system of an organisation.

Re-accreditation audit: audit conducted every three years after the first audit to verify maintenance of the quality management system and compliance with the ISTA Accreditation Standard.

Re-audit: additional audit conducted after a (re-)accreditation audit to verify the suitability of corrective actions taken to address audit findings. This might be necessary when major non-compliances occur and removal cannot be verified through submission of documents.

Scope of accreditation: The scope of accreditation gives details of activities for which the laboratory is accredited in terms of methods in the current version of the ISTA Rules performed on species or crop groups, including methods for which a laboratory can be accredited under the Performance Based Approach.

PROCESS DESCRIPTION

1. ISTA Membership

Membership in ISTA is open to laboratories supporting the Association's aims as laid down in 'The Articles of the International Seed Testing Association'. Laboratory membership services

include receipt of the ISTA Rules, free copies of new publications, participation in the proficiency test programme and access to ISTA's international network of seed scientists and technologists. A directory of all ISTA members is published on the ISTA website (<http://www.seedtest.org>). Detailed information on membership and application forms are available from the ISTA Secretariat upon request.

Only ISTA member laboratories may apply for accreditation. Laboratories that are not ISTA members must apply for membership prior to further steps toward accreditation.

2. The Scope of Accreditation

The ISTA Accreditation Standard requires a list of species and analyses for which the laboratory claims competence. By granting accreditation to a laboratory on the basis of that list, ISTA approves the list as an unambiguous reference to what the laboratory is competent to do, which infers that the accreditation assessment covered the elements of that scope to an appropriate extent.

The traditionally popular way of characterising a method by the number of a Rules chapter is ambiguous as some chapters contain a range of distinctive methods. An even more pronounced limitation of the concept becomes obvious where Rules chapters contain sections of other chapters, such as moisture determination as part of vigour testing or a tetrazolium test at the end of a germination analysis.

A laboratory's scope of accreditation will be administered through the Accreditation and Technical Department data base. Prior to an on-site audit visit, each laboratory will receive a generic form, which contains all possible methods. The laboratory will have to select the methods to be covered by accreditation and return the form. This is the basis for the on-site assessment in order to ensure that the audit team and the laboratory have a common understanding of what will be subject to assessment. The information provided by the laboratory will be fed into the data base and each laboratory's scope of accreditation will be automatically generated and sent to the laboratory as an annex to the Accreditation Certificate.

The scope of accreditation in which the laboratory is interested in should be known by the laboratory as soon as possible as they need to indicate in which PT rounds they would like to participate in. Where accredited tests are defined by groups of species (e.g. germination on 'cereals'), this grouping also applies to PT participation. If for instance, a laboratory's accreditation includes germination of a particular cereal species, then it is mandatory to participate in any proficiency test round which includes the crop group 'cereals'. When individual species need to be stated to define an accredited test, a laboratory must participate in a proficiency test only if a species used in a test round is also included in its scope of accreditation for that test objective (e.g. accreditation for accelerated ageing test for *Glycine max*).

Where accredited tests involve activities that are also subject to potential accreditation (e.g. moisture determination in an Accelerated Ageing Test or retrieving the pure seed fraction for all determinations made on pure seed), an accredited laboratory must demonstrate its competence and hold accreditation for each of the procedures concerned. The following are some examples thereof:

- Laboratories interested in being accredited for purity must also be accredited for other seeds by number and vice versa.
- Laboratories interested in being accredited for germination must also be accredited for purity as the germination test is based on the use of pure seeds.
- An exception is a tetrazolium test or embryo excision performed on the fresh seeds which remain after a germination test: laboratories accredited for germination may perform a viability test on the seeds identified as fresh seeds if present by 5% or more using tetrazolium or excised embryo without being accredited for these tests. However this only applies for this particular circumstance.
- Another exception is the weight determination performed during sample preparation for GMO testing. Laboratories accredited for GMO testing do not need to be accredited

for weight determination but must follow the ISTA Rules for weight determination when preparing the samples and when required.

- Laboratories seeking accreditation for automatic sampling must also be accredited for manual sampling.

3. Participation in the ISTA Proficiency Test Programme or appropriate comparative testing

ISTA runs a proficiency test programme covering tests such as: Purity, Other Seed Determination, Germination, Viability Testing, Moisture Determination, Vigour, GMO Testing, Seed Health Testing. The programme also covers the reporting of test results on ISTA Certificates. For some ISTA tests, no proficiency test rounds are yet available (e.g. electrophoresis testing). The performances of laboratories are rated using 'A', 'B', 'C' and 'BMP' ratings, with 'A' reflecting a very good performance. Explanations on how the ratings are calculated are described in the document 'The ISTA Proficiency Test Programme' which can be downloaded from the ISTA website (<http://www.seedtest.org>).

It is a precondition for laboratories interested to become ISTA accredited to have appropriate test results available from the ISTA Proficiency Test Programme or by comparative testing. If the tests desired for accreditation are covered in the ISTA Proficiency Test Programme, then participation in this is a precondition. Laboratories interested to apply for accreditation must participate in at least one PT round for at least one of the crop groups or species in question. Test results of all tests that the laboratory is interested in must be available. The laboratory must obtain ratings of either 'A' or 'B'.

In case there is no PT round scheduled for the next 12 months for the tests/crop groups in question, the laboratories can contact the ISTA Accreditation and Technical Department to see if a 'Mini Proficiency Test' round can be scheduled. A Mini PT round is usually organised by the chair of the Proficiency Test Committee and ISTA accredited laboratories participate on a voluntary basis acting as a reference. Completing tests on these Mini-PT samples can reduce the time for laboratories to apply for accreditation.

Member laboratories are not eligible for participation in a Mini Proficiency Test round unless they are asked by the ISTA Accreditation and Technical Department and Mini-PT rounds are not organised for non-members. They are usually also not organised for species and tests which have been dispatched as part of the normal PT programme just few months before the laboratory requested to participate.

In case that there is no ISTA test provided within the PT programme, the laboratory is requested to organise a comparative test with several laboratories accredited by ISTA for the tests of interest (the [accreditation information](#) can be found on the ISTA website). Such comparative test results must be evaluated statistically by the laboratory and submitted to the ISTA Accreditation and Technical Department for review. The Accreditation and Technical Department may seek advice of the statistics committee and may involve other technical auditors for the review.

For tests under the performance based approach the requirements stated in the documents 'Principles and Conditions for Laboratory Accreditation under the Performance Based Approach' apply.

4. Establishment of a Quality Management System

The laboratory must establish a quality management system appropriate to the laboratory's size and work range. It must define the organisation and management structure of the laboratory, including its place in the parent organisation. All elements of the ISTA Accreditation Standard must be addressed in the quality management system. Suitable documents and procedures for the system and technical part must be developed, available and used by the laboratory staff. The laboratory must have its quality management system implemented prior to the ISTA audit; thus reports of processes (e.g. internal audit and management review) must already be available.

5. Application for Accreditation

Once the laboratory has fulfilled the requirement to be an ISTA laboratory member, to have suitable PT results available and to have established a quality management system, it may contact the ISTA Accreditation and Technical Department to request the form 'Application for (Re-)accreditation'. The Accreditation and Technical Department will provide the laboratory with the current version of the application form to be filled in and submitted. They will also contact the laboratory to confirm that they have a quality management system implemented and that the related reports are available. In the application form, the laboratory must select which tests they would like to include in their scope of accreditation.

The lead auditor will check if suitable PT results/comparative tests are available. If this is the case, the laboratory will be approached to submit its quality documentation for review.

6. Document Review

For the very first accreditation audit, the laboratory will be requested to submit its entire quality documentation (e.g. Quality Manual, Procedures, work instruction or however named) for review. The auditors will review the quality documentation to see if it addresses all elements of the Accreditation Standard. If major parts are not addressed or the quality documentation was found to be not suitable, the laboratory will be informed thereof. No further steps will be taken by the Accreditation and Technical Department towards accreditation unless the laboratory has provided documents which were reviewed and found to be suitable.

For all following re-accreditation audits due in a three years cycle, the laboratory will be contacted and asked to submit the content list of its Quality Manual and the complete list of its documentation (SOPs, work instructions, forms, tables, however named). These lists provided in English shall contain the number of pages per document. Based on the application form and scope of accreditation, proficiency test results, audit report and follow-up reports of previous audits, the ISTA auditors will select quality documents to be provided for review.

All documents must be submitted in English language. They shall be sent to the Accreditation and Technical Department as electronic versions preferably provided by e-mail. The documents selected by the ISTA auditors must be submitted to the Accreditation and Technical Department latest one month prior to the audit date.

If the laboratory performed a PDE for GMO detection/quantification or comparative tests for methods not covered in the Proficiency Test Programme, it must submit the results and its evaluation to the Accreditation and Technical Department at least two months prior to the audit.

7. ISTA Audit

The laboratory will receive an invoice of the audit visit fee once the application form for re-accreditation has been submitted. The invoice must be paid at least one month prior to the audit.

The lead auditor suggests an audit date to the laboratory and provides the information about the composition of the audit team. The audit team usually consists of a system auditor and a technical auditor. Changes to this composition may be decided on depending on the necessity and availability of auditors. The laboratory has the right to appeal in writing against the selection of the auditors if there are good reasons for that. If possible a new audit team will be appointed. In the event that the grounds for objection are considered to be unreasonable or a suitable alternative cannot be identified, the Accreditation and Technical Department reserves the right to appoint the auditors originally selected.

The lead auditor will arrange together with the laboratory the transportation, accommodation and all other necessary arrangements for the audit.

ISTA audits are conducted in English language, unless the auditors can speak the local language. In this case the whole audit or parts of it may be conducted in that language. The laboratory is bound to organise translators for both auditors if the laboratory staff members do not speak English. All reports prepared by the auditors are written and provided in English.

The audit duration depends on the scope of accreditation and other factors that might have an influence on the time needed. Usually the audit duration is either 1 or 1.5 days. The laboratory must afford representatives and auditors of the accreditation body access to the laboratory premises, equipment and to all documents needed for the audit. The laboratory must be able to demonstrate all activities that they wish to include in their scope of accreditation. The auditors will audit each activity to see if the laboratory is appropriately equipped and competent in performing these.

After a meeting of the auditors, the laboratory staff will be invited to a closing meeting. The auditors will present their overall impression and the identified non-conformities to the auditee. The auditors and the auditee need to agree to a deadline until which the laboratory will address at least the substantial non-conformities. This deadline is usually three months after the audit date. The non-conformity sheets will be handed over to the laboratory representative for signing. In case that the laboratory and the auditors do not reach an agreement on a non-conformity, the auditee may submit a written complaint to the ISTA Accreditation and Technical Department (see 'Appeals and Complaints Procedure'). If no written complaint is received within a period of one month after the audit date, it will be assumed that the auditee agreed with the non-conformities even if they were not signed by the laboratory representative.

If the laboratory did not settle the audit visit fee by the time of the audit, the non-conformities will not be shared with the laboratory during the closing meeting. However, the time to address the non-conformities will be defined and will start from the audit day. Thus it is the interest of the laboratory to settle the payment soon to have as much time as possible to address the non-conformities. Once the payment is received, the laboratory will receive all audit records. In this case no signature of the laboratory will be on the original records.

In case the auditors could not collect enough evidence that proving the suitability of the quality management system and/or the competence of the laboratory and if the auditors were not confident that the laboratory is able to address the non-conformities in an appropriate way, they might request the laboratory to undergo a re-audit. During the re-audit the auditors will use the records of the last ISTA audit to assess if the laboratory investigated the root causes of the non-conformities. The effectiveness of the corrective actions taken by the laboratory will be evaluated and recorded.

The laboratory must cooperate in any pre- or post-accreditation audit or assessment, as required by the ISTA Executive Committee, and permit access to the laboratory, equipment, staff and records as required.

8. Addressing non-conformities

The auditors will prepare an audit report and audit finding report that will be sent to the laboratory. The laboratory needs to address the substantial non-conformities appropriately within a short defined timeline. Information about the root cause analysis and the corrective actions taken including related documents and records must be provided to the lead auditor as electronic version preferably by e-mail (for details see the document 'How to Respond to Audit Findings'). Both auditors will review the corrective actions and the supporting evidence and will evaluate them. The laboratory will be informed whether the corrective actions were found to be suitable or if additional steps must be taken or additional evidence must be submitted.

The laboratory must cooperate in any pre- or post-accreditation audit or assessment, as required by the ISTA Executive Committee, and permit access to records as required.

If the laboratory is not able to address the substantial non-conformities related to one specific test or activity, it might want to consider reducing its scope of accreditation. In this case the non-conformity can be withdrawn and the scope of accreditation will be reduced. The principles mentioned under '2. The Scope of Accreditation' apply.

Once all substantial non-conformities were addressed and approved by the auditors, the Accreditation and Technical Department will recommend granting accreditation to the ISTA Executive Committee.

9. Certificate of Accreditation and listing on the ISTA website

Once the accreditation of a laboratory has been approved by the ISTA Executive Committee, the following steps will be taken:

- The laboratory will be listed on the ISTA website as accredited laboratory.
- As information about a laboratory's scope of accreditation is of interest to a broad spectrum of the public including ISTA members, Technical Committees and laboratory customers, the scope of accreditation will be published and made available on the ISTA website.
- A Certificate of Accreditation signed by the ISTA president will be issued and provided to the laboratory. This Certificate indicates briefly the scope and makes reference to the laboratory's scope of accreditation. The certificate will be valid for three years starting from the audit date under the condition that the laboratory continues fulfilling its duties toward the Association (e.g. payment of fees, successful participation in obligatory ISTA proficiency test rounds and its compliance with the Accreditation Standard and ISTA Rules).

If a laboratory wishes to be re-accredited it must allow a re-accreditation audit to take place within a period of 3 years and 3 months after the last ISTA accreditation audit. In this case the laboratory will continue to be accredited during the period of preparing the audit until the Accreditation and Technical Department comes up with a recommendation for the ISTA ECOM and the ECOM comes to a decision regarding the accreditation status. If in doubt regarding the accreditation of a laboratory, the [ISTA website](#) shall be checked as it is the only controlled area to confirm accredited laboratories and their scope of accreditation.

Once a laboratory is accredited it can contact the ISTA Accreditation and Technical Department to purchase ISTA Certificates.

10. Participation in the ISTA PT programme as accredited laboratory

Once the laboratory is accredited its participation in the ISTA Proficiency Test Programme will automatically be obligatory for the combination of test/crop groups or test/species in their scope of accreditation.

The ISTA Proficiency Test Programme is a monitoring tool for the performance of the laboratory. Poor performance in the ISTA Proficiency Test Programme may lead to suspension and/or withdrawal of ISTA accreditation. Similarly, non-participation in the obligatory proficiency test rounds may lead to suspension and/or withdrawal of ISTA accreditation. Details and the conditions are described in the document 'Procedures for Termination, Suspension and Withdrawal of ISTA Accreditation'.

11. Changes in scope of Accreditation

If the scope of accreditation is changed (extension or reduction), a new version of the scope of accreditation will be issued. If necessary a new Certificate of Accreditation will be provided to the laboratory. In this case the laboratory will be requested to return the superseded Certificate of Accreditation.

11.1 Extension of scope to include new activities at the next re-accreditation audit

A laboratory may apply for an extension to its scope of accreditation on the occasion of its regular audit due in a three years' cycle. The laboratory shall give prior notice to the ISTA Accreditation and Technical Department if it intends to enlarge the scope of accreditation as this may affect the nomination of the auditors. Any extension must be indicated in the application form for re-accreditation.

11.2 Extension of scope to include new activities in between two ISTA audits

It is also possible to extend the scope of accreditation prior to the next scheduled audit. This request shall be communicated in writing to the ISTA Accreditation and Technical Department. Extension to the scope of accreditation in between two audits is

not possible for all ISTA activities. The requests will be reviewed on a case-by-case basis, and depending on the content of the request it will be assessed by either the system auditors employed at the Secretariat or by appointed technical auditors. Laboratories will be charged according to the costs incurred, determined on an hourly rate for extensions in between two audits.

Extension of the scope of accreditation for sampling: laboratories not accredited for sampling that wish to include sampling into their scope of accreditation must undergo an on-site assessment. Thus an extension in between two audits is not possible just by submitting evidence and documents. However, the laboratory can ask to prepone their re-accreditation audit which than will take place in a period of time shorter than 3 years. In this case the procedure will apply as if the laboratory has asked for a regular re-accreditation audit and only the audit visit fee will be charged.

Laboratories accredited for manual sampling are allowed to claim the inclusion of automatic sampling into their scope of accreditation. They will be asked to provide documentations and data supporting the request.

Extension of the scope of accreditation for testing: laboratories will be asked to provide relevant documentation that supports the extension request. These are for example: standard operating procedures, work instructions, related forms, training records of staff, calibration and verification records of equipment. The laboratory is also asked to provide results of proficiency tests and/or comparative tests to show that it is competent in any methods and procedures applied.

11.3 Re-instatement of accreditation on specific tests after suspension or withdrawal thereof

If the overall PT performance of the laboratory is poor the laboratory might be subject to suspension and withdrawal from ISTA accreditation. The suspension/withdrawal from accreditation might be limited to one test for which the poor PT results were obtained (e.g. suspension for germination). Following the directive 'Procedures for Termination, Suspension and Withdrawal of ISTA Accreditation' corrective actions must be taken by the laboratory and their effectiveness must be corroborated by subsequent proficiency test rounds. Once sufficient subsequent PT results are obtained to result in a calculated overall rating of at least 'C', the laboratory can be re-instated for the specific test.

Poor performance may not be related to a systematic issue in the laboratory, but can be related to the laboratory's competency in one specific area (e.g. the laboratory is performing well in germination on grasses and cereals; poor results were only obtained in germination on other agricultural crops). In this case the laboratory must participate in at least one PT round in this specific test/crop group combination and must obtain either an 'A' or a 'B' rating to be re-instated for the suspended/withdrawn test.

ANNEX

The annexes below are examples based on the ISTA Rules 2014. The content of the annexes will not be updated every year to reflect the changes of the ISTA Rules.

DISTRIBUTION LIST

ISTA website

Annex 1: Example of possible elements of a seed testing laboratory's scope of accreditation:

Testing principle	Species group	Reference	Accreditation possible
Sampling			
Manual sampling from the lot		Chapter 2	
	Grasses		X
	Cereals		X
	Small legumes		X
	Pulses		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X
	Flower species		X
Manual sampling of coated seeds		Chapter 2, 11	
	Of species mentioned under manual sampling		X
Automatic sampling from the lot		Chapter 2	
	Grasses		X
	Cereals		X
	Small legumes		X
	Pulses		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X
	Flower species		X
Automatic sampling of coated seeds		Chapter 2, 11	
	Of species mentioned under automatic sampling		X
Purity and determination of other seeds by number			
Purity and determination of other seeds by number		Chapter 3, 4	
	Grasses		X
	Cereals		X
	Small legumes		X
	Pulses		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X
	Flower species		X
Species for which blowing is mandatory		Chapter 3, 4	
	<i>Poa pratensis</i> , <i>Poa trivialis</i> and <i>Dactylis glomerata</i>		X
Purity and determination of other seeds by number on coated seeds		Chapter 3, 4, 11	
	On species mentioned under Purity		X
Component Analysis, Purity and determination of other seeds by number on seed mixtures		Chapter 3, 4, 18	
	On species mentioned under Purity		X
Germination			
Germination on 400 seeds		Chapter 5	
	Grasses		X
	Cereals		X
	Small legumes		X
	Pulses		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X
	Flower species		X
Germination on coated seeds		Chapter 5, 11	
	On species mentioned under Germination		X
Germination by weighed replicates		Chapter 5, 13	
	<i>Betula</i> and <i>Eucalyptus</i>		X
	<i>Chloris</i>		X
Germination on seed mixtures		Chapter 5, 18	
	On species mentioned under Germination		X
Viability			
TTC (Biochemical viability test)		Chapter 6	
	Grasses		X
	Cereals		X
	Small legumes		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X

Testing principle	Species group	Reference	Accreditation possible
Sampling			
Viability on coated seeds		Chapter 6, 11	
	On species mentioned under Viability		X
Viability on seed mixtures		Chapter 6, 18	
	On species mentioned under Viability		X
Embryo excision		Chapter 12	
	On species of Chapter 12		X

Seed Health

Method number	Pathogen and species group	Accreditation possible
Seed Health Chapter 7		
7-001a	Detection of <i>Alternaria dauci</i> on <i>Daucus carota</i>	X
7-001b	Detection of <i>Alternaria dauci</i> on <i>Daucus carota</i>	X
7-002a	Detection of <i>Alternaria radicina</i> on <i>Daucus carota</i>	X
7-002b	Detection of <i>Alternaria radicina</i> on <i>Daucus carota</i>	X
7-003	Detection of <i>Botrytis cinerea</i> on <i>Helianthus annuus</i>	X
7-004	Detection of <i>Phoma lingam</i> on <i>Brassica</i> spp.	X
7-005	Detection of <i>Ascochyta pisi</i> on <i>Pisum sativum</i>	X
7-006	Detection of <i>Colletotrichum lindemuthianum</i> on <i>Phaseolus vulgaris</i>	X
7-007	Detection of <i>Alternaria linicola</i> , <i>Botrytis cinerea</i> and <i>Colletotrichum lini</i> on <i>Linum usitatissimum</i>	X
7-008	Detection of <i>Caloscypha fulgens</i> on <i>Picea engelmannii</i> and <i>Picea glauca</i>	X
7-009	Detection of <i>Gibberella circinata</i> on <i>Pinus taeda</i> and <i>Pinus elliotii</i>	X
7-010	Detection of <i>Drechslera oryzae</i> on <i>Oryza sativa</i>	X
7-011	Detection of <i>Pyricularia oryzae</i> on <i>Oryza sativa</i>	X
7-012	Detection of <i>Alternaria padwickii</i> on <i>Oryza sativa</i>	X
7-013a	Detection of <i>Ustilago nuda</i> on <i>Hordeum vulgare</i>	X
7-013b	Detection of <i>Ustilago nuda</i> on <i>Hordeum vulgare</i> by dehulling method and floating embryo extraction	X
7-014	Detection of <i>Stagonospora nodorum</i> on <i>Triticum aestivum</i>	X
7-015	Detection of <i>Neotyphodium</i> spp. on <i>Festuca</i> spp. and <i>Lolium</i> spp.	X
7-016	Detection of <i>Phomopsis complex</i> on <i>Glycine max</i>	X
7-019a	Detection of <i>Xanthomonas campestris</i> pv. <i>campestris</i> on <i>Brassica</i> spp.	X
7-019b	Detection of <i>Xanthomonas campestris</i> pv. <i>campestris</i> on <i>Brassica</i> spp. on disinfested/disinfected seed	X
7-020	Detection of <i>Xanthomonas hortorum</i> pv. <i>carotae</i> on <i>Daucus carota</i>	X
7-021	Detection of <i>Xanthomonas axonopodis</i> pv. <i>phaseoli</i> and <i>Xanthomonas axonopodis</i> pv. <i>phaseolis</i> var. <i>fuscans</i> on <i>Phaseolus vulgaris</i>	X
7-022	Detection of <i>Microdochium nivale</i> and <i>Microdochium majus</i> on <i>Triticum</i> spp.	X
7-023	Detection of <i>Pseudomonas savastanoi</i> pv. <i>phaseolicola</i> on <i>Phaseolus vulgaris</i>	X
7-024	Detection of Pea Early-Browning Virus and Pea Seed-borne Mosaic Virus on <i>Pisum sativum</i>	X
7-025	Detection of <i>Aphelenchoides besseyi</i> on <i>Oryza sativa</i>	X
7-026	Detection of Squash Mosaic Virus, Cucumber Green Mottle Mosaic Virus, and melon necrotic Spot Virus in Cucurbits	X
7-027	Detection of <i>Pyrenophora graminea</i> and <i>Pyrenophora teres</i> on <i>Hordeum vulgare</i>	X
7-028	Detection of infectious tobamoviruses on <i>Solanum esculentum</i>	X
7-029	Detection of <i>Pseudomonas syringae</i> pv. <i>pisi</i> on <i>Pisum sativum</i>	X

Testing principle	Species group	Reference	Accreditation possible
Verification of species and variety			
Verification of species and variety		Chapter 8	
Examination of seeds: ultra-violet light	<i>Hordeum</i> , <i>Avena</i>	8.8.1	X
Examination of seeds: diagnostic differences in colour, size and shape by visual examination under daylight or ultra-violet light	Fabaceae (Leguminose), <i>Lolium</i> spp.	8.8.2	X
Examination of seeds: colour reaction in dilute phenol	<i>Triticum</i>	8.8.1	X
Examination of seeds: presence/absence of alkaloid	<i>Lupinus</i>	8.8.2	X
Polyacrylamide Gel Electrophoresis (PAGE)	<i>Triticum</i> , <i>Hordeum</i>	8.8.3	X
Polyacrylamide Gel Electrophoresis (PAGE)	<i>Pisum</i> , <i>Lolium</i>	8.8.4	X
Ultrathin-layer Isoelectric Focusing (UTLIEF)	<i>Zea mays</i>	8.8.5	X
Polyacrylamide Gel Electrophoresis (PAGE)	<i>Avena sativa</i>	8.8.6	X
Ultrathin-layer Isoelectric Focusing (UTLIEF)	<i>Helianthus annuus</i>	8.8.7	X
Polyacrylamide Gel Electrophoresis (A-PAGE)	<i>Triticum</i>	8.8.8	X
Polyacrylamide Gel Electrophoresis (SDS-PAGE)	<i>Triticum</i> and <i>xTriticosecale</i>	8.8.9	X
Examination of seedlings (colour of coleoptile)	Cereals	8.9.1	X
Examination of seedlings (colour of seedling)	<i>Beta</i> spp.	8.9.2	X
Examinations of seedlings (colour of cotyledons)	<i>Brassica</i> spp.	8.9.3	X

Testing principle	Species group	Reference	Accreditation possible
Examination of seedlings (fluorescence of root traces)	<i>Lolium</i> spp.	8.9.4	X
Examination of seedlings (fluorescence of root traces)	<i>Festuca</i> spp.	8.9.5	X
Examination of plants in field plots	Cereals, legumes and oil plants	8.10.1	X
Examination of plants in field plots	Herbage plants	8.10.2	X
Moisture			
Moisture content		Chapter 9	
Low and high constant temperature oven method: fine grinding	Species of Table 9A Part 1 as applicable		X
Low and high constant temperature oven method: coarse grinding	Species of Table 9A Part 1 and 2 as applicable		X
Low and high constant temperature oven method: cutting	Species of Table 9A Part 1 and 2 as applicable		X
Low and high constant temperature oven method: no grinding	Species of Table 9A Part 1 and 2 as applicable		X
Moisture meter	Species of Table 9A Part 1 and 2		X
Weight determination			
Counting and weighing		Chapter 10	
	Grasses		X
	Cereals		X
	Small legumes		X
	Pulses		X
	Other agricultural crops		X
	Vegetables		X
	Tree and shrub seeds		X
	Flower species		X
Weight determination on coated seeds		Chapter 10, 11	
	On species mentioned under Weight Determination		X
Weight determination on seed mixtures		Chapter 10, 18	
	On species mentioned under Weight Determination		X
X-ray			
X-ray		Chapter 14	
	All species of Table 2A		X
Vigour			
Vigour		Chapter 15	
Conductivity test	<i>Pisum sativum</i> , <i>Phaseolus vulgaris</i> and <i>Glycine max</i>	15.8.1	X
Accelerated ageing (AA)	<i>Glycine max</i>	15.8.2	X
Controlled deterioration (CD)	<i>Brassica</i> spp.	15.8.3	X
Radicle emergence (RE)	<i>Zea mays</i>	15.8.4	X
Size grading			
Size grading		Chapter 16	
Size grading with screens	Beta and pelleted seeds		X

ANNEX 2: EXAMPLE APPENDIX TO THE CERTIFICATE OF ACCREDITATION (ISTA RULES METHODS)



INTERNATIONAL SEED TESTING ASSOCIATION (ISTA)
 Secretariat, Zürichstrasse 50, 8303 Bassersdorf, CH-Switzerland
 Phone: +41-44-838 60 00, Fax: +41-44-838 60 01, Email: ista.office@ista.ch, <http://www.seedtest.org>

Scope of ISTA Accreditation

Annex to the Accreditation Certificate - ISTA Standard Methods

ISTA Lab code XY01
 Address Example Company
 Example City
 Example Country
 Issued on 26.09.2013
 Valid to 01.10.2015

Test: Object - Testing principle	Laboratory specific field of application includes species of:	ISTA Rules Chapter
Sampling from the lot: Obtain a representative sample - Manual sampling	Grasses Other agricultural crops	2
Sampling from the lot: Obtain a representative sample - Automatic sampling	Other agricultural crops	
Purity and identification of other seeds: Determine the percentage composition and identity of species - Separation and weighing of fractions, determination of other seeds	Grasses Other agricultural crops	3/4
Germination: Determine the germination potential - Germination on 400 seeds	Grasses Other agricultural crops	5
Viability: Estimate viability in general and of dormant seeds - Biochemical viability test (TTC)	Grasses Other agricultural crops	6
Seed Health: Determine health status - Extraction and clearing of embryos	Ustilago nuda on Hordeum vulgare	7-013a
Seed Health: Determine health status - Immunoblot method (test kit)	Neotyphodium coenophialum on Festuca arundinacea	7-015
Verification of species and variety: Verify if species/variety corresponds to the species/variety as requested - Examination of seedlings (fluorescence of root traces)	Lolium spp.	8.9.4
Moisture content: Determine moisture content - Constant temperature oven method: no grinding	Species of Table 9A Part 1 and 2 as applicable	9

XY01

The approved and most recent version of this document can be viewed on the ISTA website: www.seedtest.org

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ANNEX 3: DOCUMENTATION OF A LABORATORY'S SCOPE OF ACCREDITATION (PERFORMANCE APPROVED METHODS)

Testing for the presence of specified traits: Test for the presence of traits in the submitted sample as specified by the applicant

<i>Species</i>	<i>Testing principle</i>	<i>Reference to method and/or laboratory documentation</i>	<i>Trait/Screening element/Construct element</i>	<i>Detection/quantitative</i>	<i>ISTA PDE / OC</i>
<i>Glycine max</i>	PCR	SOPGM-101	35S Promotor	detection	PDE
	Rt-PCR	SOPGM-102		quantitative	PDE
<i>Zea mays</i>	PCR	SOPGM-103	NOS Terminator	detection	PDE
<i>Brassica napus</i>	PCR	SOPGM-104	PAT gene (GS40/90)	detection	PDE
<i>Zea mays</i>	PCR	SOPGM-105	MON810	detection	OC
	Rt-PCR	SOPGM-106		quantitative	PDE
<i>Brassica napus</i>	Bioassay (spray test)	SOPGM-107	Glyphosate herbicide resistance (GT73/RT73)	detection	OC
<i>Gossypium spp.</i>	ELISA (protein based)	SOPGM-108	EPSPS protein	detection	PDE

PDE=Performance Data Evaluation; OC=Other Check; Rt-PCR=Real-time PCR

ANNEX 4: CROP GROUPS FOR PURITY, OTHER SEED DETERMINATION AND GERMINATION TESTS. GROUP 1 TO 6 COVERS SPECIES/GENERA OF TABLE 2A, PART 1.

Crop group	Size	Species belonging to the following genera
1 (grasses)	A	<i>Poa pratensis, Poa trivialis, Dactylis</i>
	B	<i>Agrostis, Anthoxanthum, Crambe, Cynodon, Cynosurus, Deschampsia, Eragrostis, Holcus, Phleum, Poa, Schizachyrium</i>
	C	<i>Agropyron, Alopecurus, Arrhenatherum, Beckmannia, Bromus, Ehrharta, Elymus, Elytrigia, Festuca, X Festulolium, Koeleria, Lolium, Paspopyrum, Phalaris, Piptatherum, Psathyrostachys, Pseudoroegneria, Trisetum, Zoysia</i>
	D	<i>Andropogon, Astrebla, Bothriochloa, Bouteloua, Cenchrus, Chloris, Dichanthium, Pennisetum, Sorghastrum</i>
	E	<i>Axonopus, Brachiaria, Digitalia, Echinochloa, Eleusine, Melinis, Panicum, Paspalum, Pennisetum glaucum, Setaria, Urochloa</i>
2 (cereals)	A	<i>Avena, Hordeum, Secale, XTriticosecale, Triticum</i>
	B	<i>Oryza, Sorghum, Zea</i>
3 (small legumes)	A	<i>Aeschynomene, Alysicarpus, Anthyllis, Astragalus, Centrosema, Chamaecrista, Securigera, Crotalaria, Desmodium, Galega, Hedysarum, Kummerowia, Lespedeza, Leucaena, Lotus, Macroptilium, Macrotyloma, Medicago, Melilotus, Onobrychis, Ornithopus, Securigera, Trifolium, Trigonella</i>
4 (pulses)	A	<i>Vicia (small)</i>
	B	<i>Cajanus, Cicer, Lathyrus, Lens, Mucuna, Phaseolus coccineus, Pisum, Psophocarpus, Vicia (large)</i>
	C	<i>Arachis, Cyamopsis, Glycine, Lablab, Lupinus, Phaseolus, Pueraria, Vigna</i>
5 (other agricultural species)	A	<i>Beta, Brassica, Dichondra, Hibiscus, Linum, Plantago, Sinapis, Spargula, Raphanus</i>
	B	<i>Cannabis, Carthamus, Fagopyrum, Helianthus</i>
6 (vegetables, including fruits, spices and condiments)	A	<i>Achillea, Anethum, Anthriscus, Apium, Arctium, Atriplex, Atropa, Camelina, Campanula, Carum, Chrysanthemum, Glebionis, Cichorium, Claytonia, Cuminum, Daucus, Eruca, Fragaria, Lactuca, Lepidium, Solanum, Solanum hybrids, Marrubium, Matricaria, Melissa, Mentha, Nasturtium, Nicotiana, Ocimum, Oenothera, Origanum, Papaver, Petroselinum, Phacelia, Physalis, Pimpinella, Portulaca, Rheum, Rosmarinus, Rumex, Satureja, Sesamum, Stylosanthes, Taraxacum, Thymus, Valerianella</i>
	B	<i>Allium, Asparagus, Capsicum, Corchorus, Coriandrum, Cynara, Foeniculum, Pastinaca, Raphanus, Sanguisorba, Scorzonera, Solanum, Spinacia, Tragopogon</i>
	C	<i>Abelmoschus, Borago, Cucumis, Cucurbita, Cucurbita hybrids, Citrullus, Gossypium, Ipomoea, Lagenaria, Luffa, Momordica, Ricinus, Tetragonia,</i>
7 (forest species)	See Table 2A, Part 2	
8 (flower species)	See Table 2A, Part 3	

ANNEX 5: CROP GROUPS FOR VIABILITY TESTS USING THE TETRAZOLIUM METHOD

Crop groups	Species belonging to the following genera
1 (grasses)	<i>Agropyron, Agrostis, Alopecurus, Anthoxanthum, Arrhenatherum, Brachiaria, Bromus, Chloris, Cynosurus, Dactylis, Deschampsia, Elymus, Elytrigia, Eragrostis, Festuca, Holcus, Lolium, Panicum, Paspopyrum, Phalaris, Phleum, Poa, Pseudoroegneria, Setaria, Trisetum</i>
2 (cereals)	<i>Avena, Hordeum, Oryza, Secale, Sorghum, Triticum, XTriticosecale, Zea</i>
3 (small legumes)	<i>Lotus, Medicago, Melilotus, Onobrychis, Ornithopus, Trifolium</i>
4 (pulses)	-
5 (other agricultural species)	<i>Helianthus, Brassica</i>
6 (vegetables, including fruits, spices and condiments)	<i>Allium, Arctium, Cucumis, Lactuca, Solanum, Solanum hybrids, Ocimum</i>
7 (forest species)	<i>Abies, Acer, Amorpha, Calocedrus, Carpinus, Chamaecyparis, Chamaecyparis, Cornus, Corylus, Cotoneaster, Crataegus, Elaeagnus, Euonymus, Fagus, Fraxinus, Ginkgo, Ilex, Juniperus, Koelreuteria, Ligustrum, Liriodendron, Berberis, Malus, Malva, Pinus, Prunus, Pseudotsuga, Pyrus, Rosa, Styphnolobium, Sorbus, Taxodium, Taxus, Tilia, Viburnum</i>
8 (flower species)	-