



Protocol for the approval of automatic seed samplers

Any hardcopy of this document is not controlled copy

CREATED	REVIEWED	APPROVED
JANUARY 2012	MAY 2017/ JULY 2021	JULY 2021
BULKING AND SAMPLING COMMITTEE	BSC/RULES COMMITTEE AWG/ECOM	MEMBERSHIP

Scope

When seed samples are taken by automatic seed samplers for the purpose of issuing an Orange International Seed Lot Certificate, the installation and operation of the automatic seed samplers used must be approved by an accredited ISTA Seed Testing Laboratory or an accredited ISTA Sampling Entity (ISTA Rules 2.5.4.4). **The scope of accreditation of the ISTA Seed Testing Laboratory must include Sampling.**

RELATED DOCUMENTS

International Rules for Seed Testing (ISTA Rules current edition)
ISTA Accreditation Standard (current edition)
The ISTA Handbook on Seed Sampling (current edition)

RESPONSIBILITY

The ISTA Seed Testing Laboratory/Sampling Entity is responsible for ensuring that the installation and operation of the automatic seed sampler corresponds to the ISTA Rules when the approval is first issued. The ISTA Seed Testing Laboratory/Sampling Entity or designated samplers are responsible for carrying out the necessary annual monitoring.

ABBREVIATIONS

BSC: ISTA Bulking and Sampling Committee
AWG: Accreditation Working Group of the ISTA Executive Committee
ECOM: ISTA Executive Committee
TSW: Thousand seed weight

PROCESS DESCRIPTION

1. Definition of automatic seed sampler

An automatic seed sampler consists of a sampling device, an outlet for the seed sample, a container for collecting the composite sample and a timing device. A sample divider may be connected between the sampling device and the container for collecting the composite sample.

The automatic seed sampler takes primary samples from the seed stream at constant time intervals.

2. The automatic seed sampler must fulfil the following conditions

- it must sample the entire cross section of the seed stream uniformly;
- it must not damage the seed;
- it must not select seed according to size, chaffiness or any other seed characteristic;
- seed must not bounce out of the seed sampler;
- all parts must be constructed in such a way that they can be cleaned effectively or that they are self-cleaning.

3. The installation of the automatic seed sampler must fulfil the following conditions

- the primary samples must be taken after the last step of processing;
- the falling distance between the sampling device and the container for the composite sample must be similar to the falling distance of the main seed stream;
- the connection between the sampling device and the container for the composite sample must be such that no seed or impurities will remain in the funnel or duct and must not allow seed to be added or withdrawn;
- the manufacturer's installation instructions must be followed.

4. The operation of the automatic seed sampler must fulfil the following conditions

- the sampling device must be properly adjusted and operated;
- there must be an unambiguous link between the composite sample and the seed lot;
- the opening of the sampling unit must be large enough for the seeds and all possible impurities to enter it easily;
- the time the sampling unit passes through the seed stream must be long enough for seeds and impurities to enter it;

- the timing device and any other settings must not be changed during the processing of the same seed lot;
- at least the minimum number of primary samples as given in the ISTA Rules must be taken;
- the composite sample must meet the following requirements:
 - it must be sufficiently uniform compared to the seed lot;
 - at least the minimum required sample size must be obtained;
 - the container for the composite sample must be filled to the minimum level (where applicable); and
 - there must be no cross-contamination between the composite samples;
- all parts must be clean when changing from one seed lot to the next one;
- the operation staff must follow the operation and cleaning instructions;
- the ISTA Seed Testing Laboratory/Sampling Entity must be informed about any substantial adjustments to the automatic seed sampler or procedures before any changes are introduced;
- records must be kept which should contain the following data as a minimum:
 - type and date of maintenance activities, e.g. ducting cleaned, timer operation checked;
 - lot data (sampling date, species, seed lot reference number, seed lot size);
 - number of primary samples or time settings; and
 - serial number of the sample container and level to which the sample container for the composite is filled (where applicable).

There is no need to keep the records above when the authorised ISTA Seed Sampler (person) is present all the time during sampling.

5. Responsibility of the seed sampler (person)

The authorised ISTA Seed Sampler is responsible for:

- checking that the automatic seed sampler is operating properly and that the sampling fulfils the requirements described above when used for ISTA sampling purposes;
- refusing the sample when
 - any of the requirements above are not met;
 - the sample does not seem to be sufficiently uniform; or
 - the sample size differs from the expected sample size;
- ensuring that all parts of the sample collection duct and automatic seed sampler that can be opened or manipulated are sealed. There is no need for sealing those parts when the authorised ISTA Seed Sampler is present when the sample is taken;
- checking that relevant records are made for each seed lot; and
- re-sampling manually when necessary.

6. Approval of the automatic seed sampler, its installation and operation

A seed company that intends to use an automatic seed sampler must send a request for approval to the relevant ISTA Seed Testing Laboratory/Sampling Entity.

If an automatic seed sampler is moved to a new location, it must be retested and re-approved.

The application must include:

- the type, brand and unique number of the automatic seed sampler as well as a description of the way it operates;
- a description of the installation of the sampling unit and the container for the composite sample in the seed-processing stream;
- the intended procedures and instructions for operation, maintenance and cleaning;
- a responsible person for the automatic seed sampler who is to be the contact person for the ISTA Seed Testing Laboratory/Sampling Entity, and
- which of the four species groups will be sampled by the automatic seed sampler. It is up to the ISTA Seed Testing Laboratory/Sampling Entity to decide in which group a species belongs:

- A. Less sensitive bigger seeds (species with seeds equal to or bigger than *Triticum aestivum* subsp. *aestivum* seeds)
- B. Sensitive bigger seeds (e.g. Pulses)
- C. Small-seeded species (species with seeds smaller than *Triticum aestivum* subsp. *aestivum* seeds) that are non-chaffy species
- D. Small seeded chaffy species

The ISTA Seed Testing Laboratory/Sampling Entity will check the application and decide if the type and installation of the automatic seed sampler meets the conditions under points 2 and 3 above.

The ISTA Seed Testing Laboratory/Sampling Entity and the seed plant installing the automatic seed sampler should agree which tests should be performed on the samples. The ISTA Seed Testing Laboratory/Sampling Entity will determine the test plan on the basis of discussions with the seed plant.

The test plan should be based on the species involved. The tests that give the highest probability to highlight any difference between the two methods should be applied.

Ten seed lots have to be sampled twice for comparative testing, i.e. once manually by an ISTA approved method and once by the automatic seed sampler. The testing must take place after the installation of automatic seed sampler.

The manual sampling must be performed by an authorised ISTA Seed Sampler. Sampling conducted by the automatic seed sampler must be performed under the supervision of an authorised ISTA Seed Sampler.

There must be no additional processing of the seed lot in between the two composite samples being taken.

The submitted samples must be obtained and sealed by the authorised ISTA Seed Sampler. In cases where the reduction of the composite sample is not necessary or cannot be performed e.g. because the composite sample is automatically sealed after the automatic sampling process, the composite sample can be regarded as the submitted sample.

The samples must be tested by an ISTA Seed Testing Laboratory.

The ISTA Seed Testing Laboratory/Sampling Entity responsible for the approval of the automatic seed sampler may set up additional requirements.

The automatic seed sampler can only be approved for the species groups that it has been tested for.

Testing plan

The testing plan is based on the species groups (mentioned above) that the automatic seed sampler is to be used for. 10 seed lots per species group must be sampled twice and tested. However, if 7 lots are accepted, then the ISTA Seed Testing Laboratory does not need test all 10 seed lots.

If seed lots from more than one group are to be tested,
Groups A and B: If tested for B, it is not necessary to test for group A.
Groups C and D: If tested for D, it is not necessary to test for group C.
Groups A and B don't affect testing on groups C and D and *vice versa*.

Each pair of samples must be examined for at least two quality attributes, which can be:

- other seeds by number;
- purity:
- germination, or
- thousand seed weight

The ISTA Seed Testing Laboratory is free to use other comparative tests if it is more useful to detect differences.

Guidance on which information to take into account and which test to apply is given below:

Purity, other seed count

If it is anticipated that the seed lot has a high purity level or that no other seeds are present, other quality attributes should be applied.

Germination

Germination is obligatory for species group B.

Thousand seed weight (TSW)

TSW can be used for species for which the seed size can vary within the same seed lot to check, if the automatic seed sampler selects on weight.

The submitted and working sample size must be in accordance with the sample sizes specified in Table 2C.

Where dividers are integrated in the processing system, the dividers must be tested before being installed by using a testing procedure that applies to dividers.

If possible, the two corresponding samples should be examined by the same analyst. If the analysis has been carried out by different analysts and the results are out of tolerance, the analysis will have to be conducted once more by same analyst.

Purity, other seed count and germination: The results for the two corresponding composite samples are to be compared by means of appropriate ISTA tolerance tables.

For all tests, there must be no systematic difference in the results obtained from the analysis done on the samples from automatic seed samplers and those that were manually sampled.

The automatic seed sampler can be approved for a species group, if at least 70% of the tested seed lots (7 out of 10) show no significant differences between the two samples regarding two quality attributes. If the first seven samples are within tolerances and without any systematic differences for all tests carried out, the automatic seed sampler can be approved.

If substantial changes are made to the seed transfer system to which the automatic seed sampler is connected, the ISTA Seed Testing Laboratory/Sampling Entity may require a new set of check samples to be taken as described above.

The approval, as well as any conditions of the approval, shall be communicated in writing. The approval must be kept as part of the company's records as long as the automatic seed sampler is in operation or suspended due to a new set of check results.

There must be an unambiguous link between the approval document and the approved automatic sampler.

7. Expiration of the approval

This protocol does not specify a specific expiration period of the approval since automatic seed samplers, under good maintenance conditions, are known to work very consistently and reliably for a long time.

ISTA Seed Testing Laboratory/Sampling Entity may restrict the approval to a certain time period depending on the expected stability of working conditions and the quality of maintenance of the automatic seed sampler.

If the ISTA Seed Testing Laboratory/Sampling Entity has restricted the time of the approval, a new full approval can be made after a successful completion of testing as in section 6.

8. Annual Monitoring Check

The automatic seed sampler and sampling operation must be checked at least once a year under the responsibility of the ISTA Seed Testing Laboratory/Sampling Entity. The annual check should include, but not necessarily be restricted to, timer adjustments, cleanliness, seals and sampling operation of the automatic seed sampler together with any possible weak points of a specific brand.

It is not necessary to take monitoring samples for testing annually unless there are observations from the annual check that would suggest the ISTA Seed Testing Laboratory/Sampling Entity should require this action.

A checklist can be used for this purpose, see the example below.

ANNEX

Checklist for Initial Accreditation and Periodic Assessment of Automatic Samplers

DISTRIBUTION LIST

ISTA Membership

CHECKLIST FOR INITIAL ACCREDITATION AND PERIODIC ASSESSMENT OF AUTOMATIC SAMPLERS

Company:

Machine / plant:

Assessed by:

Date:

CRITERIA THAT IS ONLY CHECKED ONCE AT THE INITIAL APPLICATION FOR THE ACCREDITATION OF AN AUTOMATIC SEED SAMPLER			
Criteria checked	Complies		Description of non-conformity
	yes	no	
a. Correct adjustment and working			
b. Comparison of results of samples taken manually and automatic samples			
c. Operating instructions present and implemented			
d. Type/brand of sampler indicated			

CRITERIA THAT MUST ALWAYS BE CHECKED (Both at the initial accreditation and at the periodic checks)			
Criteria checked	Complies		Description of non-conformity
	yes	no	
1. Automatic sampler			
a. Sampling intensity meets norms			
b. Sampling entire seed stream			
c. No seed spilled (found outside sample reception container)			
d. No seed comes to the container between the subsamples			
e. Constant seed stream/in case sample is taken from a bunker: seed not moving			
f. Adjustment is readable			
g. Working of the sampler is readable and can be followed when required			
h. Records/logbook present and up to date			
i. Staff member appointed as responsible person for operating automatic sampler			

Criteria checked	Complies		Description of non-conformity
	yes	no	
2. Reception of primary samples			
a. Closed circuit/duct between sampler and sample reception container			
b. Sampler and ducting is well cleaned			
c. No seed can be added or withdrawn			
d. Sample containers uniquely identified before sampling			
e. Right filling level/right quantity			
f. If plastic tube is used, the method of closing the samples is sufficient to prevent contamination / seed loss			
g. Homogeneity of primary sample can be checked			
h. Sample cannot be changed/tampered with			

Remarks:

REVISION HISTORY

Version #	Changes made
2.0	<p>Text reviewed and updated by BSC main changes were: "Technical guideline" removed from the document title. Scope: clarified that the protocol is a minimum requirement and not just guidance. Section 1: definition text improved. Section 4: minimum records required defined. Section 5: sealing requirements for automatic samplers clarified. Section 6: options for comparative sample testing clarified. Section 6: option to stop testing once 7/10 samples are accepted added. Section 6: need for company where the automatic sampler is located to maintain the approval record added. Section 7: expiry period for automatic sampler approval clarified. Section 8: annual monitoring check requirements clarified. Checklists: requirements clarified. Typeface changed to Arial</p>
2.1	<p>Editorial corrections Sampling entity added</p> <p><u>Scope</u>: When seed samples are taken by automatic seed samplers for the purpose of issuing an Orange International Seed Lot Certificate, the installation and operation of the automatic seed samplers used must be approved by an accredited ISTA Seed Testing Laboratory or an accredited ISTA Sampling Entity (ISTA Rules 2.5.4.4). The scope of accreditation of the ISTA Seed Testing Laboratory must include Sampling.</p> <p>"authorised ISTA seed sampler" used instead of "ISTA sampler" ISTA Accreditation Standard (current edition) added as reference document</p> <p><u>Section 4</u>: added: "at least" the minimum number of primary samples and "at least" the minimum required sample for composite sample; "authorised" ISTA seed sampler</p> <p><u>Section 6</u>: Added/improved: The manual sampling must be performed by an authorised ISTA Seed Sampler. Sampling conducted by the automatic seed sampler must be performed under the supervision of an authorised ISTA Seed Sampler.</p> <p>The submitted samples must be obtained and sealed by the authorised ISTA Seed Sampler. In cases where the reduction of the composite sample is not necessary or cannot be performed e.g. because the composite sample is automatically sealed after the automatic sampling process, the composite sample can be regarded as the submitted sample.</p> <p>Groups A and B don't affect testing on groups C and D and <i>vice versa</i>.</p> <p>For all tests, there must be no systematic difference in the results obtained from the analysis done on the samples from automatic seed samplers and those that were manually sampled.</p> <p>There must be an unambiguous link between the approval document and the approved automatic sampler.</p> <p>Change: The ISTA Seed Testing Laboratory/Sampling Entity responsible for the approval of the automatic seed sampler (which has automatic seed sampling in its scope) may set up additional requirements. Change: ISTA tolerance tables. (Tables: 3E, 4A, 5C).</p> <p><u>Section 8</u>: It is not necessary to take monitoring samples for testing annually unless there are observations from the annual check that would suggest the ISTA Seed Testing Laboratory/Sampling Entity should require this action.</p> <p><u>Section 3</u>: Change: and as close as possible to the container filling equipment;</p> <p><u>Section 6. Testing plan</u> Change: However, if the first 7 lots are accepted, then the ISTA Seed Testing Laboratory does not need <u>to sample and</u> test all 10 seed lots.</p>
3.0	<p>Layout change Scientific names update for <i>Triticum aestivum</i> subsp. <i>aestivum</i> Table 2A changed to 2C</p>