Protocol for the approval of automatic seed samplers

This document was updated by the ISTA Bulking and Sampling Committee. It has been reviewed by the ISTA Executive Committee and Rules Committee. It is submitted to the ISTA Ordinary General Meeting 2016 for voting by the nominated ISTA Designated Members on behalf of their respective Governments.

It is submitted to all ISTA Designated Authorities, ISTA Members and ISTA Observer Organizations for information two months prior to the ISTA Ordinary General Meeting 2016.

It will be discussed and voted on, together with Rules Proposal C.2.10. (Revision of 2.5.4.4 Sampling from the seed lot) of the Rules Proposals for the International Rules for Seed Testing 2017 Edition, at the ISTA Ordinary General Meeting 2016 to be held in Tallinn, Estonia, under Agenda point 11. Consideration and Adoption of the Proposed Rules Changes.
Protocol for the approval of automatic seed samplers

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

<table>
<thead>
<tr>
<th>Created by</th>
<th>Reviewed by</th>
<th>Approved by</th>
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<tbody>
<tr>
<td>Date:</td>
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<tr>
<td>January 2012</td>
<td>February 2016</td>
<td>June 2016</td>
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<tr>
<td>Name:</td>
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<tr>
<td>Bulking and Sampling Committee (BSC)</td>
<td>BSC/Rules/Executive Committee (ECOM)</td>
<td>Membership</td>
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Valid from: 21.06.2016 if approved by vote at June 2016 voting meeting.
**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 (ISTA Rules 2.5.4.3). This protocol provides the minimum requirements for approval of automatic seed samplers.

**RELATED DOCUMENTS**


**RESPONSIBILITY**

The ISTA seed laboratory 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 laboratories, or designated samplers, are responsible for carrying out the necessary annual monitoring.

**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 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 character;
- 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 and as close as possible to the container filling equipment;
- 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 fulfill the following conditions

- the sampler 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;
- the minimum number of primary samples must be taken;
- the composite sample must meet the following requirements:
  - it must be sufficiently uniform compared to the seed lot;
  - the minimum required sample size must be obtained;
  - the container for the composite sample must be filled to the minimum level (where applicable);
  - 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 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
  - 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 seed sampler (person) is present all the time during sampling.

5. Responsibility of the seed sampler (person)

The seed sampler (person) is responsible for:

- checking that the automatic seed sampler is operating properly and that the sampling fulfills 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;
  - 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. However, there is no need for those parts that open to be sealed if the ISTA seed sampler is present when the sample is taken.
- checking that relevant records are made for each seed lot;
- re-sample 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 prior to installation. 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,
- which of the four species groups will be sampled by the automatic seed sampler. It is up to the ISTA seed testing laboratory to decide in which group a species belongs:
  
  A. Less sensitive bigger seeds (species with seeds equal to or bigger than *Triticum aestivum* seeds),
  B. Sensitive bigger seeds (e.g. Pulses),
  C. Small-seeded species (species with seeds smaller than *Triticum aestivum* seeds) that are non-chaffy species,
  D. Small seeded chaffy species.

The ISTA seed testing laboratory 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 laboratory and the seed plant installing the automatic seed sampler should agree which tests should be performed on the samples. The ISTA seed testing laboratory will determine the test plan on the basis of discussions with the seed plant/company.

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, e.g. - manually by an ISTA approved method and by the automatic seed sampler. The testing must take place after the installation of automatic seed sampler.

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

The samples must be tested by an ISTA seed laboratory.

The ISTA laboratory responsible for the automatic seed sampler must have automatic seed sampling on its scope of accreditation and may have additional requirements not described in this protocol.

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 the first 7 lots are accepted, then the ISTA laboratory need not to test all 10 seed lots.

If seed lots from more than one group are to be tested then for:

Groups A and B: if tested for B, then it is not necessary to test for group A,
Groups C and D: if tested for D, then it is not necessary to test for group C,
Groups A and B testing does not affect the testing requirement for groups C and D.

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 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) can be used for species for which the seed size can vary within the same seed lot and the automatic seed sampler could cause sorting based on TSW.

The working sample size must be in accordance with the working sample size in Table 2A.

Where dividers are integrated in the processing system, the dividers must be tested before being installed by using a suitable approval 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 result is out of tolerance, the analysis may have to be completed 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 (e.g. Tables: 3E, 4A, 5C).

For all tests, there must be no systematic difference between samples from automatic seed samplers and manually sampled samples.

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 s. 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 may require a new set of comparative samples to be taken as described above.
The approval, as well as any conditions of the approval, must be communicated in writing. The approval, and/or re-approval, must be kept as part of the company’s records for as long as the automatic seed sampler is in operation.

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 laboratories 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 laboratory 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. 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. Annual monitoring samples are not required unless there are any remarks from the annual check that suggest the ISTA seed laboratory should require this action.

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

CHECKLIST FOR INITIAL ACCREDITATION AND PERIODIC ASSESSMENT OF AUTOMATIC SAMPLERS

Company: …………………………………………………………………

Machine / plant: ………………………………………………………..

Assessed by: ……………………………………………………………

Date: …………………………………… ...…………………………..

<table>
<thead>
<tr>
<th>CRITERIA THAT IS ONLY CHECKED ONCE AT THE INITIAL APPLICATION FOR THE ACCREDITATION OF AN AUTOMATIC SEED SAMPLER</th>
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<tbody>
<tr>
<td>Criteria checked</td>
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<tr>
<td>--------------------------------------------------------</td>
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<tr>
<td>a. Correct adjustment and function of sampler, e.g. pneumatic valves, timers</td>
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<tr>
<td>b. Comparison of results of samples taken manually and automatic samples</td>
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<td>c. Operating instructions present and implemented</td>
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<td>d. Type/brand of sampler indicated</td>
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### CRITERIA THAT MUST ALWAYS BE CHECKED
(Both at the initial accreditation and at the periodic checks)

<table>
<thead>
<tr>
<th>Criteria checked</th>
<th>Complies</th>
<th>Description of non-conformity</th>
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<tr>
<td></td>
<td>yes</td>
<td>no</td>
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#### 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**
- **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**

#### 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

<table>
<thead>
<tr>
<th>Version 2.0</th>
<th>Changes made</th>
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| February 2015 | 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. |
| 19 April 2016 | Typeface changed to Arial |