

# Preface to the 2023 edition of the ISTA Rules

Since 2014, the *International Rules for Seed Testing* (ISTA Rules) are primarily available in electronic format. The ISTA Rules can be downloaded as a complete PDF file or as individual chapters from:

[www.ingentaconnect.com/content/ista/rules](http://www.ingentaconnect.com/content/ista/rules).

If required, users of the ISTA Rules can print their own copies. For further information on the ISTA Rules, see:

[www.seedtest.org/rules](http://www.seedtest.org/rules).

The electronic version includes the English, French, German and Spanish versions of the ISTA Rules. If there are any questions on interpretation of the ISTA Rules, the English version is the definitive version.

## Seed health testing methods

Previously, the seed health testing methods were published as a separate Annexe to Chapter 7 of the ISTA Rules. They are now available as separate method sheets from the ISTA website at:

[www.seedtest.org/seedhealthmethods](http://www.seedtest.org/seedhealthmethods).

## Details of changes

The 2023 changes are editorial corrections or Rules changes adopted at the Ordinary General Meeting held at Cairo, Egypt in May 2022. Edits were made in Adobe InDesign by Vanessa Sutcliffe of HeartWood Editorial ([www.heartwoodeditorial.co.uk](http://www.heartwoodeditorial.co.uk)).

The changes in the text content from the previous edition of the ISTA Rules are listed below. They can be displayed with yellow highlight boxes as a 'layer' over the English version within the electronic copy, with comments on what has changed.

For the previous history of amendments to the ISTA Rules, see the Prefaces for 2003 to 2022 on the ISTA website.

*Ernest Allen, ISTA Rules Committee Chair*

*Susan Alvarez, ISTA Rules Committee Vice-Chair*

*ISTA Secretariat*

## Changes to the ISTA Rules for 2023

### Chapter 1

**1.1, 1.2, 1.2.4, 1.3, 1.4.1, 1.4.2, 1.4.3, 1.6:** Edits made following offer of optional electronic seed analysis certificates from 2023, for use by accredited member laboratories of ISTA. Proposal developed by ISTA Rules Chair with input from Secretariat and ECOM.

### Chapter 3

**3.7:** Paragraph moved for clarification of reporting authorities when determining scientific names for pure and other seeds reported on ISTA Certificates. Harmonisation of reporting between 3.7 and 4.7. Proposal developed by Purity TCOM and approved by unanimous vote.

**3.7:** Proposal developed and approved by Purity TCOM to indicate how other seeds and inert matter found in the second whole sample test shall be reported, providing clear guidance to the second whole sample test.

### Chapter 4

**4.7:** Wording altered for clarification of reporting authorities when determining scientific names for pure and other seeds reported on ISTA Certificates. Harmonisation of reporting between 3.7 and 4.7. Proposal developed by Purity TCOM and approved by unanimous vote.

### Chapter 5

**5.6.2.3, 5.6.3.1:** Proposal gives clarification that the temperature prescribed for prechilling should be measured from on or in the substrate during prechilling. Proposal developed and approved by Germination TCOM.

**5.6.5.3:** Proposal gives clarification that a tetrazolium test can be conducted to determine viability of fresh

ungerminated seeds, at the end of a germination test, for species listed in Table 5A. Proposal developed by Germination TCOM and approved by Germination and Tetrazolium TCOMs.

**5.10:** Proposal to add Seedling Evaluation Groups to Table 5A (Parts 1, 2 and 3), giving benefit to seed analysts and ensuring that correct group is used. Proposal developed and approved by Germination TCOM.

**Table 5A Part 1:** Addition of new temperature regime (20 °C) for germination of *Anethum graveolens* following an ISTA peer method validation study. Proposal developed and approved by Germination TCOM.

**Table 5A Parts 1, 2 and 3:** Proposal to add Seedling Evaluation Groups to Table 5A, giving benefit to seed analysts and ensuring that correct group is used. Proposal developed and approved by Germination TCOM.

### Chapter 7

**Method 7-031:** Addition of option to use a sieve with filter paper or an equivalent nematode-permeable container (such as a non-woven plant growth bag) for filtration. Proposal developed and approved by Seed Health TCOM, and supported by method validation study.

### Chapter 8

**8.10.4 (new section):** Inclusion of DNA-based test for testing *Pisum* varieties. Proposal developed by working group within Variety TCOM and supported by validation study. Proposal approved by Variety TCOM.

**8.10.5 (new section):** Inclusion of DNA-based test for testing *Avena sativa*. Proposal supported by validation study. Proposal developed and approved by Variety TCOM.

**Table 8I:** Table relabelled as 8R due to addition of new methods in Chapter 8.

## Chapter 9

**9.2.7:** Paragraph moved and bullet point added to improve clarity. Proposal developed and approved by Moisture TCOM.

**9.3.2.6:** Editorial correction to improve sentence clarity.

**9.3.2.7:** Bullet point added to improve clarity. Proposal developed and approved by Moisture TCOM.

**Table 9A Part 1:** Editorial corrections of nomenclature changes approved in 2019 *ISTA List of Stabilised Plant Names*. *Elytrigia* spp. updated to *Elymus* spp.

## Chapter 19

**19.1:** Introduction of acronym TP for ‘trait purity’. Small risk of ambiguity with TP used in Chapter 5 for ‘top of paper’. In cases where ambiguity might exist, ‘trait purity’ should be used in full. Proposal developed and approved by GMO TCOM.

**19.2:** Editorial corrections made that do not modify intent, including renumbering of paragraphs and word substitutions.

**19.2:** New definitions added and numbering of definitions throughout section modified as a result.

**19.2.17:** Improvement of definition of term ‘analyte’, relating it to term ‘target’ widely used in Chapter 19.

**19.2.20:** Improved definition of ‘performance-based approach’ as a mechanism to ensure uniformity in testing.

**19.2.21:** Improved definition of ‘proficiency test’ to clarify object of assessing ability of subject (laboratory, operator) to carry out a test, not a specific method.

**19.3:** Section revised, including precise definition of pieces of evidence a laboratory must provide to apply for accreditation under performance-based approach. Requirement of method validation or verification is introduced. Precise specification of requirement of production of performance data on seed samples is given. Use by laboratories of results obtained in non-ISTA proficiency tests is accepted as evidence.

**19.4:** Section retitled ‘Objectives and approaches’ consistent with revised terminology. Testing objectives and approaches defined in relation to each other, with reference to Fig. 19.1. Two paragraphs describing ‘technical aspects’ moved to end of section. Sentence indicating need for reference material in quantitative

PCR deleted since digital PCR does not necessarily require it. Several editorial changes made.

**19.4.1:** Redundant sentence deleted regarding size of working sample compared to submitted sample. Specification that working sample can be analysed in single or in multiple units of observation. Clarification of concept of limit of group/bulk size (not of working sample size) in relation to limit of quantification.

**19.5:** Section retitled ‘Testing technologies’ consistent with revised terminology.

**19.5.1.1:** Minor changes and specifications in bullet points.

**19.5.1.3:** Addition of need to verify identity of PCR products in real-time PCR when using intercalating dyes.

**19.5.2.2:** Simplification of text on lateral flow strip test.

**19.5.2.3:** Simplification of text on enzyme-linked immunosorbent assay.

**19.5.3.1:** Replacement of ‘resistance’ with ‘tolerance’ as a more appropriate term when referring to herbicides.

**19.6.1:** Specification added that testing results for both assessment of presence or estimation of level can be referred either to seed sample or seed lot. Deletion of unnecessary sentence, and other minor changes and specifications.

**19.6.2:** Modification of section title and text for consistency with revised terminology and to improve clarity.

**19.6.3:** New reference (Remund *et al.*, 2020) added.

**19.7:** Specification of details to be provided when reporting results on an ISTA Certificate, including conditions for reporting results of GMO testing on Orange or Blue International Certificates.

**19.7.1:** Section retitled ‘Assessment of presence of GMO’ consistent with revised terminology, and editorial changes made. Clarification of how to express compliance to a given standard when a working sample tests negative to a qualitative assay for a given target.

**19.7.2:** Section retitled ‘Estimation of the level of GMO by multiple qualitative tests of individuals or groups’ consistent with revised terminology.

**19.7.3:** Section retitled ‘Estimation of the level of GMO by quantitative measurements on groups or bulks’ consistent with revised terminology. Specification of conditions for reporting results of GMO testing on Orange or Blue International Certificates. Other editorial changes made to improve clarity.

**19.8:** New reference (Remund *et al.*, 2020) added and link for SeedCalc download on ISTA website updated.

**Table 19A (new table):** Table to summarise types of analytical output that can be attained using different approaches in GMO testing.

**Figure 19.1:** Figure redrawn according to revised terminology. More information provided including new concepts (unit of observation, testing approach) and relating workflow to different analytical outputs.