

**OFFICIAL SEED TESTING STATION  
SEED TESTING LABORATORY, KEDL0100**

**Standard Operating Procedure:**

**Purity and Other Seed Determination**

**SOP/MET/03**

**Revision number 14**

**Issue date: 18<sup>th</sup> January, 2023**

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**PURITY AND OTHER SEED DETERMINATION  
STANDARD OPERATING PROCEDURE  
SOP/MET/03**

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Approved by: ..... ..

Technical Manager

Quality Assurance Manager

Date:.....

Date:.....



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#### 1.0 **Purpose:**

- 1.1 To determine the percentage composition by weight of the sample being tested and by inference the composition of the seed lot, and the identity of the various species of seeds and inert particles constituting the sample. (*For Purity analysis*)
- 1.2 To estimate the number of seeds of other species stated by the applicant either generally (e.g all other species) or by reference to one category of seeds (e.g species scheduled as noxious in a certain country) or specifically (e.g *Elytrigia repens*) – [*For other seed determination*]

#### 2.0 **Scope:**

- 2.1 From the sample division and sampling to recording of weights of various fractions in purity analysis and identification and recording of the number of other seeds found in the sample in determination of other seeds

#### 3.0 **References:**

- 3.1 Request for Sampling/Sealing/Testing of seed for Certification (FormSR9).
- 3.2 International Rules for Seed Testing (ISTA Rules-Current Edition)
- 3.3 Quality Assurance Manual
- 3.4 Other crop seeds identification guides
- 3.5 Reference collection

#### 4.0 **Definitions:**

- 4.1 *Complete test*; is one in which the whole working sample is searched for all other seeds present
- 4.2 *Limited test*; is one in which the search is restricted to stated species in the whole working sample
- 4.2 *Reduced test*; Is one in which only part of the working sample is examined.
- 4.3 *Reduced-limited test*; is one in which less than the prescribed weight of seed of a working sample is examined for stated species only.
- 4.4 KEPHIS: Kenya Plant Health Inspectorate Service (Seed Certifying Agent-SCA)



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- 4.5 Seed Testing Laboratory (STL) - The Laboratory for seed testing with capability to conduct seed sampling, analyze seed samples for various tests and to report the analysis results.
- 4.6 ISTA - International Seed Testing Association
- 4.7 Seed analyst – Person qualified and approved/Authorized by Managing Director KEPHIS to analyze seed samples at the Seed Testing Laboratory
- 4.8 Official Seed Tester (OST) – Person in charge of the Seed Testing Laboratory

### 5.0 **Responsibilities**

- 5.1 Official Seed Tester: Owner of the process
- 5.1 Analyst: Seed Analyst/In-charge, Purity analysis
- 5.2 STL: Publishing of final certificates.

### 6.0 **A. Procedure for Purity Analysis**

- 6.1 Open sample and mix it 3 times using the soil divider.
- 6.2 Subdivide the sample using soil divider to obtain a working sample. Refer to Appendix P4 of this SOP on how to use, maintain, and calibrate the soil divider.
- 6.3 Prepare and label the container to put the working sample after weighing.
  - a. Choose the balance to use according to the number of decimal places stated in current edition of the ISTA Rules Section 3.5.1 and weigh the working sample for purity analysis as indicated on the list against each balance depending on crop species specified in ISTA Rules chapter 2, table 2A part 1 and 2.
  - b. Record the weight of the working sample and sign in the purity card (WC/STL/PUR).
  - c. Transfer the working sample from the balance pan to the labeled container.
  - d. Refer to the Appendix P3 of this SOP on how to use and maintain the balance before using it.



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6.4 (a) Use analyzing board for purity analysis.

**Separation**

1. Pour weighed sample on the analyzing board
- | 2. By the help of a separating knife and a lens separate:-
  - a. Pure seed
  - b. Inert matter
  - c. Other crop seeds
3. Put the above 3 fractions in 3 different containers, weigh separately and record in the purity card (WC/STL/PUR).
4. Identify other crop seeds found, the kind of inert matter and record in the purity card. Use the seed reference collection in identification of other crop seed.
5. Sign and indicate the date of analysis in the purity card (WC/STL/PUR).
6. For big seeds, insert eight labels bearing the test number of the sample.
7. Clean the analyzing board and the knife with a piece of cloth.

**Calculation & Expression of results**

**i. Test for weight gain or loss during purity analysis**

1. Add together the weights of all component fractions from the working sample
2. Compare with the original weight as a check against gain or loss of weight. If there is a discrepancy of more than 5% of the initial weight, a retest must be made. The result of the retest is then reported on the purity card (WC/STL/PUR).

**ii. Calculation of component percentages**

1. The % is based on the sum of the weights of the components, not on the original weights of the working sample.



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2. Calculate the percentage of each component to at least two decimal places
3. Round each fraction to one decimal place. Components of less than 0.05% are reported as trace.
4. Add together the % of all fractions, excluding those less than 0.05% (Trace). The fractions must total 100.0%. If the sum does not equal 100.0%, (either 99.9 or 100.1%) then add or subtract 0.1% from the largest value.
5. Report the % by weight of each component parts to one decimal place in the purity card.
6. Report the scientific name of other species of pure seed in accordance with Table 2C of the current ISTA Rules or the current Rules of ISTA stabilized plant names. Where it is impossible to determine the species with certainty on the basis of seed characteristics, reporting must be done to the most precise taxon possible
7. Take the purity card to O. S. T or Technical Manager

**B. Procedure for determination of Other Seeds by number**

1. The working sample should not be less than the weight in table 2C part 1 column 5 in Current ISTA Rules.
2. Open the sample and mix it 3 times using the sample divider.
3. Subdivide the sample using soil divider to obtain a working sample for reduced and reduced-limited test. Otherwise search the whole working sample if the test is complete or limited.
4. Prepare and label the container to put the working sample after weighing.  
Choose the balance to use according to the number of decimal places stated in ISTA Rules Section 3.5.1.
5. Search the working sample either for seeds of all other species or of certain stated species as requested by the applicant.
6. Count and record the number of species sought in the purity card(WC/STL/PUR)



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#### Calculation and expression of results

- a) Results are expressed as the number of seeds belonging to each stated species or category found in the actual quantity examined.
  - b) In addition, the number per unit weight (eg. Per kg) may be calculated
  - c) To check for tolerances, use table 4A and 4B of the ISTA Rules(current edition)
7. Take the test results to O.S.T or Technical Manager.

#### C. Procedure for Purity analysis of samples for Weighed replicate germination method

1. Open sample and use the hand halving method to obtain a working sample. Refer to operating procedure in Clause D below
  - a) Examine the sample for authentication of species and removal of readily identifiable seeds of other species
  - b) The name and number of such other seeds found together with the weight examined must be reported on the purity card (WC/STL/PUR).

#### D. Procedure for Hand halving method

1. Pour the sample evenly onto a smooth clean surface
2. Mix the seed, thoroughly, into a mound with a flat-edged spatula
3. Divide the mound into half and halve each half again-giving four portions
4. Halve each of the four portions again giving eight portions
5. Arrange the eight portions in two rows of four, combine and retain alternate portions
6. Combine the first and third portions in the first row with the second and fourth in the second row
7. Remove the remaining four portions
8. Repeat the procedure using the retained portions until the required sample size is obtained.
9. Weigh the working sample and record on the purity card (WC/STL/PUR).



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**E. Sample movement**

1. Sign in Sample movement register (R/STL/17) on collecting the sample for tests
2. After obtaining the working sample, dispatch post control sample to sample reception section.
3. After separation of components, place the samples for pure seed fraction at the purity section dispatch desk.
4. Put the inert matter and other crop seeds in the remnant sample container.
5. Take the remnant sample, inert and other crop seeds to sample store and sign in R/STL/08 register

**7.0 Records:**

- 7.1 Purity card (WC/STL/PUR)
- 7.2 Sample storage and disposal register (R/STL/08)
- 7.3 Sample movement register (R/STL/17)

**8.0 Flowchart**

- 8.1 Flowchart for purity test.



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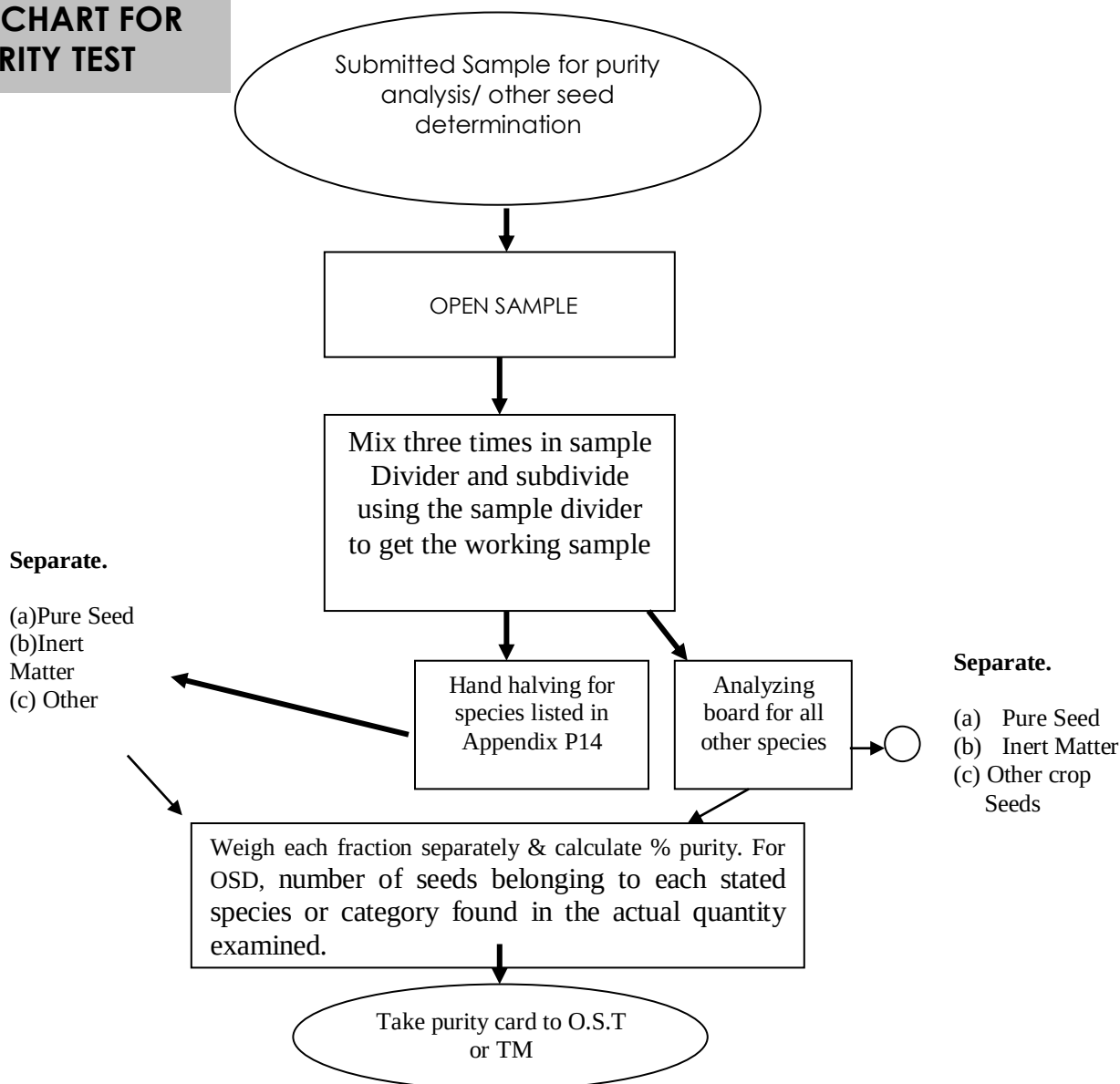
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**FLOWCHART FOR  
PURITY TEST**



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### Appendices

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