



Basic Principles of Seed Testing for Quality Assurance

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Testing of the seeds is necessary to evaluate the planting value of seeds and to achieve the following objectives for minimizing the risks of planting low quality seeds. Seed testing is determining the standards of a seed lots like, physical purity, moisture, germination and other distinguishing variety and thereby enabling the farming community to get quality seeds. The seed testing laboratory (STL) is the main hub of seed quality control. Seed testing services are required from time to time to gain information regarding planting value of seed lots and seed testing is possible for all those who produce, sell and use quality seeds.

Objectives of Seed Testing

- ✓ To determine the quality i.e. suitability for planting.
- ✓ To identify seed quality problems and their probable cause.
- ✓ To determine the need for drying and processing and specific procedures to be used.
- ✓ To determine, if seed meets established quality standards or labelling specifications.
- ✓ To establish quality and provide a basis for price and consumer discrimination among lots in the market.

Procedure of Seed Testing

After the samples are received in the laboratory, it is first entered in a register and assigned laboratory test numbers and code, which is used in all subsequent analysis.

1. Moisture Test

The moisture test is conducted immediately after the registration of seed sample.

2. Sampling

The submitted sample is divided to obtain working samples required for various tests either by mechanical divider, random cups, spoon or by modified halving method.

3. Minimum Weight

The working samples weight for purity analyses are calculated to contain at least 2500 seeds, but subjected to a maximum of 1000 g for sample weight. For counts of other species, there are the 10 times the weight for purity, subject to a maximum of 1000 g.

4. Purity Test

Each working sample is separated into two fractions: the selected component and the rest component. Both fractions are weighed and the weight of the former is calculated as a percentage of both together.

Fractions of Purity Test

Pure Seed

The pure seed means the seeds of kind/variety stated by sender or found to predominate in the test and shall include all botanical varieties and cultivars of that species. The following structures are regarded as pure seeds:

- ✓ Intact seeds i.e. seed in the botanical sense.
- ✓ Achenes and similar fruits, schizocarps and mericarps with or without perianth and regardless of whether they contain a true seed, unless it is readily apparent that no true seed is present.
- ✓ Pieces of seeds, achenes, mericarps and caryopsis, resulting from breakage that are more than one half their original size. However, seeds of the Leguminosae, Cruciferae with the seed coats entirely removed shall be regarded as inert matter.
- ✓ Florets and caryopses of Gramineae.

Other Crop Seeds

Other crop seeds shall include seeds and seed like structures of any plant species other than of pure seed.

Inert Matter

Inert matter shall include seeds, seed like structures and other matters such as soil, sand, stones, stems, leaves and flower etc. and all other matter that are not seeds.

Weed Seeds

It includes seeds of those species normally recognized as weeds or specified under a regulation of the Seeds Act as a noxious weed.

Germination

The objective of seed germination testing is to obtain information with respect to the planting value of the seed and to provide results which could be used to compare the value of different seed lots. Germination of a seed lot in a laboratory is the emergence and development of the seedling to a stage where the aspect of its essential structures indicates whether or not it is able to develop further in to a satisfactory plant under favourable condition in soil.

The essential structures are well developed and intact root system, hypocotyl, plumule and one or two cotyledons according to the species. The germination tests shall be made with seeds from the pure seed fraction of a purity test. A minimum of four hundred seeds are required in four replicates of 100 seeds each or eight replicates of 50 seeds each. The seeds shall receive no pretreatment, and are tested for normal seedlings, abnormal seedlings, hard seeds, fresh ungerminated seeds and dead seeds and the results are calculated in percentage.

Seed Health

Health of a seed refers primarily to the presence or absence of disease-causing organisms such as fungi, bacteria, virus and animal pests such as eelworms and insects. Seed health testing, therefore, is necessary to obtain information regarding health status of a seed lot which is necessary for the following reasons:

- ✓ Seed borne inoculum may give rise to progressive disease development in the field and reduce the commercial value of the crop.

- ✓ Imported seed lots may introduce new diseases.
- ✓ It may elucidate seedling evaluation and causes of poor germination or field stand establishment.

After testing, the report of the seed analysis is conveyed to the Certification Agency Office in a prescribed proforma. This is further conveyed to the respective production agency with direction to whether packing is permitted or not permitted. On the basis of the results seed growers are given payment by production agency.

References

1. Rajasthan State Seed and Organic Certification Agency website: <https://agriculture.rajasthan.gov.in/content/agriculture/en/RSSOPCA-dep/seed-certification/process-of-certification/field-inspection.html>
2. TNAU Agritech Portal: https://agritech.tnau.ac.in/seed/Seed_seedtesting.html

