

SEED TECHNOLOGY

6. Physical Purity Analysis:

Purity analysis

The purity analysis of a seed sample in the seed testing laboratory refers to the determination of the different components of the purity viz., pure seeds, other crop seeds, weed seeds and inert matter.

Definitions of Purity components:

Pure seed

The seeds of kind / species stated by the sender. It includes all botanical varieties of that kind / species. Immature, undersized, shriveled, diseased or germinated seeds are also pure seeds. It also includes broken seeds, if the size is $>1/2$ of the original size except in leguminacea, and cruciferae where the seed coat entirely removed are regarded as inert matter.

Other crop seed

It refers to the seeds of crops other than the kind being examined.

Weed Seed

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

Inert matter

It includes seed like structures, stem pieces, leaves, sand particles, stone particles, empty glumes, lemmas, paleas, chaff, awns, stalks longer than florets and spikelets.

Objective:

The objective of the purity analysis is to determine whether the submitted sample conforms to the prescribed physical quality standards with regard to physical components.

Weighing the working sample:

The number of decimal places to which the working sample and the components of the working sample should be weighed is given below.

Weight of the working sample (g)	The number of decimal places required	Example
<1	4	0.7534
1-9.999	3	7.534
10-99.99	2	75.34
100-999.9	1	753.4
1000 or more	0	7534

Purity separation

The working sample after weighing is separated into its components *viz.*, pure seed, other seed crop, weed seed and inert matter.

Method of purity separation

Place the sample on the purity work board after sieving / blowing operations and separate into other crop seeds and inert matter. After separation, identify each kind of weed seeds, other crop seeds as to genus and species. The names and number of each are recorded. The type of inert matter present should also be noted.



Purity Work Board

Calculation

All the four components must be weighed to the required number of decimal places. The percentages of the components are determined as follows.

$$\% \text{ of components} = \frac{\text{Weight of individual component}}{\text{Total weight of all components}} \times 100$$

If there is a gain or loss between the weight of the original samples and the sum of all the components is in excess of one percent, another analysis should be made.

ODV: Other Distinguishable Varieties

Indian Minimum Seed Certification Standard includes the standards for other distinguishable varieties (by number) for the crops. The purity analyst, therefore, is required to determine the extent of seeds of other distinguishable varieties in these crops. The principles and methods for this determination are given below

1) Working sample: Working sample shall be the same as for the determination of the other species.

2) Principle of determination: The determination of seeds of other distinguishable characters shall be done only on the basis of readily apparent differences in the stable morphological characteristics of the seeds. While making this determination for varietal purity. The morphological characteristics of the seeds shall be examined under magnification where-ever necessary. For colour characters the seeds should be examined under full daylight conditions. The availability of authentic samples for comparison is must for this determination.

3) Determination: Place the seeds on purity workboard and examine each seed with the aid of magnifying lens. Separate seeds differing in morphological characteristics and colour of the seed coat/pericarp. For colour characters the seeds may be examined under full daylight.

Reporting and results:

The result of a purity analysis shall be given to one decimal place and the percentage of all components must total 100. Components of less than 0.05% shall be reported as 'Trace'. The percentage of pure seed, other crop seed, weed seed and inert

matter must be reported in the spaces provided on the Analysis Certificate. If the result for a component is nil, this must be shown as '0.0' in the appropriate space. Laboratory reports of purity analysis performed in accordance with the rules should include:

1. Name and address of the issuing laboratory
2. Name of responsible individual
3. Laboratory test sample number
4. Date report of analysis is issued
5. Application information, such as kind of seed, cultivar, lot number, lot size, certification number, treatment, etc.
6. Kind of pure seed by common name as cited in the Plant Improvement Act
7. If submitted sample is treated, inoculated, film coated, coated, encrusted, or pelleted
8. Percentage by weight of pure seed, other crop seed, inert seed, inert matter and weed seed, given to two decimal places
9. Scientific name or common name, or both, of all other crop seed or weed including noxious weed seed found in the purity test. If none is found, this must be indicated.

References:

Seed Technology – R.L.Agrawal

Seed Technology - Khare and Dhale

Seed Technology and Seed Pathology – Sharma, Chobey and Ramprakash

Seed Science and Technology – B.Tiwari

Seed Science and Technology – A.K.Joshi and B.D.Singh

Pest Management in Vegetables – I.M.Khan

Seed Technology –Dahiya and Rai

Principals of Plant Breeding – B.D.Singh

<http://agritech.tnau.ac.in/seed/>

<https://www.seedtest.org/>

<http://agriquest.info/>

<https://seednet.gov.in/CMS/>