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Seed quality: concept and quality characteristics

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Seed Quality Concept

- ❖ The quality of seeds is considered as an important factor for **increasing yield**.
- ❖ The use of quality seeds helps greatly in **higher production** per unit area to attain food security of the country.
- ❖ Quality seeds have the ability for **efficient utilization of the inputs** such as fertilizers and irrigation.
- ❖ Well thought policy, planning, congenial regulatory system, facilities for capacity and structural improvement both in public and private sectors are required for production, processing, preservation, and distribution of sufficient quantity of quality seeds in time to the farmers.

Importance of quality seed

1. Seed is a vital input in crop production;
 - It is the cheapest input in crop production and key to agriculture progress.
 - Crop status largely depends on the seed materials used for sowing.
 - Response of other inputs in crop production depends on seed material used.
2. The seed required for raising crop is quite small and its cost is so less compared to other inputs
3. This emphasizes the need for increasing the areas under quality seed production
4. It is estimated that good quality seeds of improved varieties can contribute about 20-25% increase in yield.

Benefits of using quality seeds

1. They are genetically pure (true to type).
2. The good quality seed has high return per unit area as the genetic potentiality of the crop can be fully exploited.
3. Less infestation of land with weed seed/other crop seeds.
4. Less disease and insect problem.
5. Minimization of seed/seedling rate i.e., fast and uniform emergence of seedling.
6. They are vigorous, free from pests and disease.
7. They can be adopted themselves for extreme climatic condition and cropping system of the location.
8. The quality seed respond well to the applied fertilizers and nutrients.
9. Uniform in plant population and maturity.
10. Crop raised with quality seed are aesthetically pleasing.
11. Good seed prolongs life of a variety.
12. Yield prediction is very easy.
13. Handling in post-harvest operation will be easy.
14. Preparations of finished products are also better.
15. High produce value and their marketability.

High Quality Seeds



High \longrightarrow Poor
Quality

relatively
pure

viable

fewer weed
seeds

full & uniform
in size

free from seed-
borne pests &
diseases



Quality Seed

Quality seed is defined as varietally pure with a high germination percentage, free from disease and disease organisms, and with a proper moisture content and weight.

- ❖ Quality seed insures good germination, rapid emergence, and vigorous growth. These aspects translate to a good stand (whether greenhouse or field).
- ❖ Poor quality seed results in "skips," excessive thinning, or yield reductions due to overcrowding, all of which diminish profitability.



Factors affecting seed quality

Seed quality is determined by a number of genetic and physiological characteristics. The genetic component involves differences between two or more genetic lines, while differences between seed lots of a single genetic line comprise the physiological component.

The genetic factors

- ❖ Genetic makeup
- ❖ Seed size
- ❖ Bulk density

The physical or environmental characteristics

- ❖ Injury during planting and establishment
- ❖ Growing conditions during seed development
- ❖ Nutrition of the mother plant
- ❖ Physical damage during production or storage by machine or pest
- ❖ Moisture and temperature during storage
- ❖ Age or maturity of seed.

Structural concept of seed quality

Seed quality is a multiple concept comprising several components (Thomson, 1979). The components are divided in four major groups:

1. Genetic quality
2. Physical quality
3. Physiological quality
4. Pathological quality



Seed Quality

Components of Quality

Genetical

- ❖ Cultivar Purity
- ❖ Longevity

Physical

- ❖ Analytical Purity
- ❖ Moisture Content
- ❖ Size
- ❖ Appearance
- ❖ Colour, Insect bites, presence of other undesirable materials

Physiological

- ❖ Germination Capacity
- ❖ Viability
- ❖ Vigour
- ❖ Vitality
- ❖ Dormancy

Pathological

- ❖ Health
- ❖ Fungus
- ❖ Bacteria
- ❖ Virus
- ❖ Nematods
- ❖ Insect
- ❖ Mechanical damage

Seed Quality

1. Physical Attributes

- A minimum of damaged seed
- A minimal amount of weed seed or inert matter
- A minimum of diseased seed
- Near uniform seed size

2. Physiological Attributes

- **Germination Percentage or Viability**

The germination percentage or viability is an indicator of the seed's ability to emerge from the soil to produce a plant in the field under normal conditions

- **Seed Vigour**

Seed vigour is the capacity of seed to emerge from the soil and survive under potentially stressful field conditions and to grow rapidly under favourable conditions

