



## Seed Moisture Content

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Seed moisture is one of the most important deciding factors of seed viability and quality during storage. According to ISTA (1985), moisture content of the sample is defined as that loss of weight when it is dried in accordance with rules or the amount of water collected when it is distilled. It is expressed as percentage of the original weight of sample (wet basis). It is the most important attribute, influencing seed quality and storability. It can be determined either by using moisture meter or hot air oven method.

### Objectives

- ▶ To determine the moisture content of seed by methods suitable for routine use.
- ▶ Moisture tests aim to determine to quantity of water present by passing a sample in an oven.

### Principles

The methods prescribed are designed to reduce:

- ▶ Oxidation
- ▶ Decomposition
- ▶ The loss of other volatile substances
- ▶ Ensuring the removal of as much moisture as possible.

### Seed ageing and loss of seed germination

- ▶ Seed ageing can't be stopped, but can be minimized by proper seed storage conditions.
- ▶ The two important environmental factors influencing are: Relative humidity = Governs seed moisture and Temperature.

### Harrington's Rules

- ▶ For every decrease of 1% seed moisture the life of seed is doubled.
- ▶ For every decrease of 5°C in storage temperature the life of the seed is doubled. Rule 1 hold's good when the seed moisture content is b/w 14 and 5%.

### Equipments to estimate seed moisture content

- ▶ Moisture meter of different types, Constant temperature oven, Moisture containers/bottles of glass or stainless steel, Desiccators with silica gel, An adjustable grinding mill/seed grinder, Sieves set of 0.5, 1.0 & 0 mm mesh and receptacle, Cutting tools, Analytical balance

### Moisture Meters

- ▶ Working principles, where the seed:
- ▶ Is weighted on built-in-balance, and heated by an infra-red lamp or electrical heating elements

- ▶ Moisture is determined by their conductivity
- ▶ Moisture content is directly proportional to the resistance and the dielectric constant of the seed sample.

### Grinding Mill

- ▶ Adjustable, to obtain particles of dimensions desired
- ▶ Constructed of non-absorbent material
- ▶ Constructed so that both the seeds and ground material are protected from ambient air, to the extent possible
- ▶ Air currents that might cause loss of seed moisture be reduced to a minimum
- ▶ Grind the seed evenly at a speed that does not cause heating ,and loss of moisture
- ▶ Easy to clean.

### Calculation of Results

- ▶ The moisture content be calculated up to one decimal place.
- ▶ As % age by weight, using the formula:
- ▶ % age of M.C=  $(M2-M3)/(M2-M1) \times 100$ , Where
- ▶ M1: is the weight in gm of the container and its cover,
- ▶ M2: is the wt in gm of the container, its cover and its contents before drying, and
- ▶ M3: is the wt in gm of the container, its cover and its contents after drying
- ▶ M2-M3: Moisture loss
- ▶ M2-M1: Fresh weight of sample (weight should take at minimum of three decimal places)

### Pre- Drying

- ▶ Not obligatory for tree seeds
- ▶ For seed species, where grinding is obligatory and with  $\geq 17\%$  moisture
- ▶ Soybean seed with  $\geq 10\%$  moisture
- ▶ Paddy seed with  $\geq 13\%$
- ▶ On two sub-samples, each weighing  $25 \pm 1$  gm, dried on open trays, for 5 to 10 min at  $130^\circ\text{C}$
- ▶ In *zea mays* with  $\geq 25\%$ , dried for 2-5hrs at  $65-75^\circ\text{C}$
- ▶ For other species with  $\geq 30\%$ , dried overnight in a warm place.

### Precautions

- ▶ Submitted sample be accepted for moisture determination only if, it is an intact moisture-proof container
- ▶ Determination be started soon after receipt
- ▶ Exposure of sample to lab atmosphere be reduced to the absolute minimum
- ▶ If grinding not required, not more than two min elapse from the time the sample is removed from container.

### References

1. Agarwal, R. L. (2018). *Seed technology*. Oxford and IBH Publishing.