

Exp2: Comparative study of different methods of testing seed germination

The seeds may be tested for their germination in many ways depending on the availability of materials, convenience and type of seed to be tested. Keeping these points in mind any of the following describe methods may be employed for germination test.

1. Petri-dish method

This method is useful for small sized seeds e.g. tobacco, tomato, mustard, etc.

Materials: petri dishes, blotting or filter paper, glass marker, seeds, water dispenser

Procedure:

1. Place two blotting or filter papers on the bottom of the petri-dish and soak with water. (Number of papers can be increased or decreased according to the need of water by seed and size of seed)
2. Place convent number of seed (10-20 depending upon the size of seed) on the surface of water soaked blotting or filter papers in perti-dish.
3. Write the kind of seed, date and time of sowing on the cover of petri-dish with glass marker.
4. Apply measured quantity of water in Petri dish using water dispenser.
5. Record the data given in the table 2

2. Rolled towel method

Materials: towels, seeds to be tested, marker,

Procedure:

1. Place two wet towels on a smooth table.
2. Place appropriate number of seeds on the upper surface of the towels and cover it with two wet towels.
3. Make a fold on the bottom of the towels to prevent the seeds from falling out.
4. Roll the towels from right to left.
5. Roll the towels loosely to allow the normal expansion of seedlings.
6. Write information like kind of seed, date and time of seed soaking etc.
7. Place the rolled towels in single layer.
8. Apply water to keep the towels moist
9. Record the data given in table 2.

3. Slanting technique

This method has been developed by the Department of Agronomy, University of Agriculture, Faisalabad. This method is usually used for testing the seeds of cereals. The advantages of this method are that you need not to apply water to the seeds, the root and shoot length can be measured by scale on the slant and root and shoot movement can be observed without uprooting the seedling.

Materials: Slants, water trays or germination trays, blotting or filter paper, tissue paper, marker

Procedure:

1. Place the blotting or filter paper on the slant and moisten it.
2. Place the seeds on the line marked at the slant.
3. Cover the seeds with tissue paper or blotting paper.
4. Place the slant in the germination tray so that it makes an acute angle.
5. Record the data given in table 2

Sand method:

This method is suitable for all types of seeds to be tested but it generally gives low germination percentage compared with other methods. However the data obtained from this method is of great practical utility because the conditions are quite comparable to field.

Materials: Aluminum pan or plastic tray of 23cm x 23 cm x 8 cm, sand, sprinkler, seeds

Procedure:

1. Fill the pan with moisten sand (75 ml water is mixed with 500 g sand) to three-fourth of their depth.
2. Place the seeds on the surface of the sand and then cover with thin layer of sand (1.25-2.5 cm depending upon kind of seeds)
3. Label the pan for the name of crop-seed, date and time of planting.
4. Sprinkle water when needed.
5. Record data given in table 2 periodically.

Germination test through germinator

In this methods seeds can be grown on different temperatures ranges.

Materials: Germinator, petri-dishes, blotting paper,

Procedure:

1. Place the seeds on the moist blotting paper or in between two folds of papers in petri-dishes (Large seeds can be grown in dishes containing sand)
2. Set the temperature or range of temperature according to the requirements for the specific time.
3. Apply adequate water when needed with water dispenser or sprayer.
4. Record the data given in the table 2.

Table 2: Days to germination and seedling establishment as affected by different methods of testing seed germination.

Method	Days to germ.	Germ. (%)	Shoot length (cm)	Root length (cm)	Shoot dry weight (g)	Root dry weight (g)
Petri-dish						
Rolled towel						
Slanting Technique						
Sand						
Germinator						

Note: shoot, root length and dry weights will be recorded 7 days after soaking/sowing

Repetition of germination test

The germination test is needed to be repeated under following circumstances.

- i. When test conditions are wrong with errors in seedling evaluation.
- ii. When seed show dormancy, phytotoxicity or spread of infection.
- iii. When large number of fresh ungerminated seeds are found at the end of test.

Why germination test is not conducted in the field

The ideal test for germination would be to sow the seed in the field according to the normal farming practice. But this is not possible for two reasons, firstly, results are needed before sowing time and secondly the results should be always reproducible. Therefore, the germination test should be conducted under controlled and standardized condition, which cannot be obtained from the field.