

Seed and germination

The seed: is mature, fertilized ovules, ovules are structures of seed plants (spermatophytes) containing the female gametophyte with the egg cell.

Or the seed is an embryonic plant in dormancy state.

Seed structure: composed form/

1. Seed coat (testa and tegmen): testa (hard) the outer protective layer of the seed and tegmen (soft) the inner layer.

Hilum and funiculus/ funicular scar on seed coat that marks the point at which the seed was touched via funiculus to the ovary tissue.

Micro Pyle/ is canal or hole in the coverings (seed coat) of the nucleus through which the pollen tube usually passes during fertilization and during the germination, the micro Pyle serve as a minute pore through which water enters.

2. Embryo: composed from embryonic axis which connected with embryonic leaves (cotyledon) the embryo consist from/

Epicotyl Terminate by plumule.

Hypocotyl Terminate by radicle.

Embryonic leaves (cotyledons)

Storage food..... May be carbohydrate (starch), protein (aleuronic grain) or lipids.

This food may be stored in a special tissue called (endosperm) in this case called (endospermic seeds), or stored in cotyledons one or two and in this case called (non-endospermic seed).

Seed germination:

It is awakening of the dormant embryo (the minimum of the physiological activates) as soon as the necessary conditions are satisfied the phenomenon of germination being, which includes/

1. Physical or natural changes.
2. Chemical changes or process of digestion & translocation.
3. Vital changes or embryonic division starting.

Necessary condition for germination:

External factors/

1. Moisture, the seed germination start from 30-40%.
2. Temperature, the optimum temperature 20-35 °C.
3. Oxygen, for respiration and energy production.
4. Light, CO₂, optimum pH. Low temp. all them called some special requirements for an a certain seeds kinds.

Internal factors/

1. Viability or capacity to germinate, its affected by factors like, plant species, humidity, Temp.
2. Food and plant hormones like auxine.
3. Complete the resting period.
4. Pathogenic agents

Duty question/ define this terms: seed dormancy, vernalization, rest period, stratification, scarification, Epigeal and hypogeal germination?

The practice part:

An experiment on seed germination in the laboratory.

Requirements/ ptree dishes, filter paper, seeds, distal water, nutrient solution for a hormone or an element, incubator at 35°C.

Procedure/

1. Each treatment/ 4 ptree dish(replications)
(0, 10, 20, 40 ppm) ... prepared from a stock solution of nutrient solu.
For hormone or element.
2. Each replicate/ 2 filter paper
3. Each replicate/ 5-8 seeds
4. In first day a lot of amount of liquid for the seed imbibition.

5. In another days (2-10)..... only rain off the filter paper with the certain solution.

Experimental measurement/

$$\text{rate of germination (\%)} = \frac{\text{final count of germinating seed}}{\text{no.of seed in replicate!}} \times 100$$

$$\text{velocity of germination(seedling/day)} = \frac{\text{no.of seedling in first count}}{\text{!days no.from germi.to first count}} + \frac{\text{no.of seedling in second count}}{\text{!days no.from first count to second count.}} + \dots \text{etc.}$$

$$\text{velocity for plumul elongation (cm/day)} = \frac{\text{plumul's long mean (cm)}}{\text{days number of exp.}}$$

$$\text{velocity for radical elongation (cm/day)} = \frac{\text{radical's long mean (cm)}}{\text{days number of exp.}}$$

Seedling dry weight Weighting the seedling in each replicate for (24 hr.) in oven (72°C) then count the weight for one seedling.