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Seed Storage :: Packing Materials

Types of storage

1. Storage at ambient temperature and humidity

Seeds can be stored in piles, single layers, sacks or open containers, under shelter against rain, well ventilated and protected from rodents and store at least for several months.

2. Dry storage with control of moisture content but not temperature

Orthodox seeds will retain viability longer, when dried to low moisture content (48%) and then stored in a sealed container or in a room in which humidity is controlled, than when stored in equilibrium with ambient air humidity. Cool condition is especially favourable.

3. Dry storage with control of both moisture content and temperature

This is recommended for many orthodox species which have periodicity of seeding but which are planted annually in large scale afforestation projects. A combination of 4-8% moisture content and 0 to 5° temperature will maintain viability for 5 years or more.

4. Dry storage for long-term gene conservation

Long-term conservation of gene resources of orthodox agricultural seeds is -18°C temperature and 5±11% moisture content

5. Moist storage without control of moisture content of temperature

Suitable for storage of recalcitrant seeds, for a few months over winter. Seeds may be stored in heaps on the ground, in shallow pits, in well drained soils or in layers in well ventilated sheds, often covered or mixed with leaves, moist sand, peat or other porous materials. The aim is to maintain moist and cool conditions, with good aeration to avoid overheating which may result from the relatively high rates of respiration associated with moist storage. This may be accomplished by regular turning of the heaps.

6. Moist cold storage, with control of temperature

This method implies controlled low temperature just above freezing or less commonly, just below freezing. Moisture can be controlled within approximate limits by adding moist media e.g., sand, peat or a mixture of both to the seed, in proportions of one part media to 1 part seed by volume, and re-moistening periodically or more accurately by controlling the relative humidity of the store. This method is much applicable to temperate recalcitrant genera.



7. Cryopreservation

It is also called as cryogenic storage. Seeds are placed in liquid nitrogen at -196°C. Seeds are actually placed into the gaseous phase of the liquid nitrogen -150°C for easy handling and safety. Metabolic reactions come to a virtual standstill at the temperature of liquid nitrogen and the cells will remain in an unaltered state until the tissues are removed from the liquid nitrogen and defrosted. Therefore, little detrimental physiological activity takes place at these temperatures, which prolongs the storage life of seeds. It is not practical for commercial seed storage, but is useful to store the valuable germplasm.

Storage containers

(1) Moisture pervious

- If seed store has facilities for controlling temperature and relative humidity, than permeable containers can be safely used for orthodox seeds, for several years, provided that pests can be excluded. eg., cotton bags, paper cardboard, fibre board.



(2) Moisture impervious

- After drying the orthodox seeds to correct moisture content, seeds can be placed in sealed moisture proof containers.
- This avoids extensive dehumidification requirements. Long term storage is most effective when moisture proof containers are combined with controlled low temperatures provided by refrigeration.
- This method has an added advantage of exclusion of oxygen. It is not suitable for recalcitrant seeds, however ego 700 gauge polythene bags.



3. Moisture resistant

- They include polyethylene or other plastic films and aluminum foil. These are resistant to the passage of moisture but over a long period of time, these will be a slow passage of water vapour tending to equilibrate the relative humidity inside and outside the container.

- Polyethylene is not suitable for long-term storage of orthodox seeds for genetic conservation, because there is no absolute control over moisture uptake by the seeds. It is very much suitable for short or medium term storage and has given excellent results.



Seed storage sanitation or godown sanitation

- Storage environment should be free from insects and rodents
- Chemicals such as insecticides, fertilizers should not be stored along with seeds.
- Storage room should be kept cool and dry
- Fumigation may be done whenever needed
- Use wooden pallets for arranging the bags in criss-cross manner for effective ventilation on all sides of the bags.
- Seed bags should be stacked upto 6-8 tires depending upon density of seeds
- Restocking once in 3 months or less is important for prolonging seed viability
- Before storage disinfect the godowns by spraying malathion 50% E.C. @ 5 lit /100 m2 area.
- If old gunnies, cloth bags and containers are to be used these should be fumigated with aluminium phosphide.
- Size of the stack should be 30x20 feet facilitate fumigation under gas proof or polythene covers.
- Periodical inspections should be carried out and control measures to be taken i.e malathion 50% E.C. @ 5 lit /100 m2 area should be applied in every 3 weeks
- It must be borne in mind that fumigation, particularly repeated fumigation, may seriously reduce the vigour and even the germination capacity of seeds. Seeds with m.c. greater than 14% should be dried to below this value before fumigation

Maintenance of viability in storage

- Store well mature seeds
- Store normal coloured seeds
- Seeds should be free from mechanical injury
- Seeds should be free from storage fungi or micro organisms
- Storage godown should be fumigated to control storage insects, periodically
- Storage environment or godown should be dry and cool.
- Seeds should be dried to optimum moisture content
- Required R.H. and temperature should be maintained during storage.
- Seeds should be treated with fungicides before storage
- Suitable packaging materials should be used for packing.

Source: Training manual on seed management,

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