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## Session124: Seed Storage and Seed Viability



# Introduction

**Seed storage** is referred as preservation of seed with initial quality until it is needed for planting

A viable seed is one which is capable of germination under suitable conditions

Viability implies the ability of the seed to germinate and the ability of the seedling to establish itself in the environment in which the seed finds itself

## **Objective of seed storage**

- To maintain initial seed quality like, germination, physical purity, vigour etc., all along the storage period by providing suitable or even better conditions
- Since the main objective of seed storage is maintenance of an acceptable capacity for germination and emergence, it can only be accomplished by reducing the rate of deterioration to the degree required to maintain an acceptable level of quality for the desired period

# Stages/segments of seed storage

**The entire storage periods can be divided into:**

|   |                                      |  |
|---|--------------------------------------|--|
| 1 | Post maturation/ pre harvest segment | Period from physiological maturity to harvest (seed in field)                                      |
| 2 | Bulk seed segment                    | Period from harvest to packaging (bulk seed in aeration drying bins, surge bins, etc.)             |
| 3 | Packaged seed segment                | Period from packaging to distribution (seed in Packages in warehouse)                              |
| 4 | Distribution/ Marketing segment      | Period during distributing and marketing (packaged seed in transit and / or retailer's storehouse) |
| 5 | On-farm segment                      | Period from purchase to planting of seed (seed in on-farm storage)                                 |

# Types of storage

Broadly seed storage can be classified into 4 types-

1. Storage of commercial truthfully labeled and certified seed
2. Storage of carry over seeds
3. Storage of foundation seed stocks and enforcement seed samples
4. Storage of germplasm seeds

**1. Storage of commercial seeds:** It requires the largest storage need from harvest until planting. The storage period ranges from 8-9 months. Seed must be dried to 14% moisture content for starchy seed and 11% for oilseeds.

# Types of storage

## 2. Storage of carryover seeds:

- About 20-25% of stored seed may have to be carried over through one season to the second planting time
- The storage period may range 1-1½ year
- Storage of seeds in metal bins with tight fitting lids or in a moisture proof bag will solve the problems of moisture penetration, provided the seeds are already dry enough for sealed storage

# Types of storage

## 3. Storage of foundation stock and enforcement seed sample:

- It is desirable to store foundation and enforcement seeds for several years since genetic drift are minimized by reproducing foundation or stock seeds
- Since the quantity of seeds involved is not large, the storage room is only a small part of the total storage area and in fact, is often a small room within a large warehouse
- Relative humidity and temperature combination has to be provided for maintaining the viability
- A combination of 25 per cent RH at 30°C temperature or less or a RH of about 45 per cent at 20°C or less will be ideal
- The required RH can be achieved by making the room moisture proof and by using a dehumidifier

# Types of storage

## 4. Storage of germplasm seed storage:

- Germplasm seeds are required to be kept for many years, perhaps very long periods.
- Basic requirements for such long term storage are the coldest temperature economically possible and seed moisture is in equilibrium with 20-25 per cent RH.
- Germplasm storage built up so far have rooms which can be maintained at 5oC to 10oC and 30 per cent RH.
- In addition, the stored samples are dried to perfect moisture level.

# Classification of packing materials or containers

## 1. Moisture and vapour pervious containers:

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

Ex: cotton bags, paper cardboard and fibre board



## 2. Moisture impervious but vapour pervious containers:

These allow entry of water in the form of vapour and not in liquid. The seeds in the containers can't be carried over for long period in hot humid conditions.

Ex: polythene bags of <300 gauge thickness and urea bags





# Classification of packing materials or containers

## 3. Moisture and vapour proof containers:

These containers will not allow entry of moisture in the form of liquid or vapour

Used for long term storage even in hot humid conditions if the seeds are sealed at optimum moisture content

Ex: Polyethylene bags of >700 gauge thickness, aluminium foil pouches, rigid plastics etc



# Factors influencing seed storage

## Biotic factors

### a. Factors related to seed

- Genetic make up of seed
- Initial seed quality
- Provenance
- Seed moisture content

### a. Other biotics

- Insects
- Fungi
- Rodents
- Mishandling during sampling, testing

## Abiotic factors

- ✓ Temperature
- ✓ Relative humidity
- ✓ Seed store sanitation
- ✓ Gaseous atmosphere
- ✓ Packaging material

# 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
- Seeds should not have met with adverse conditions during maturation
- 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





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Thank  
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