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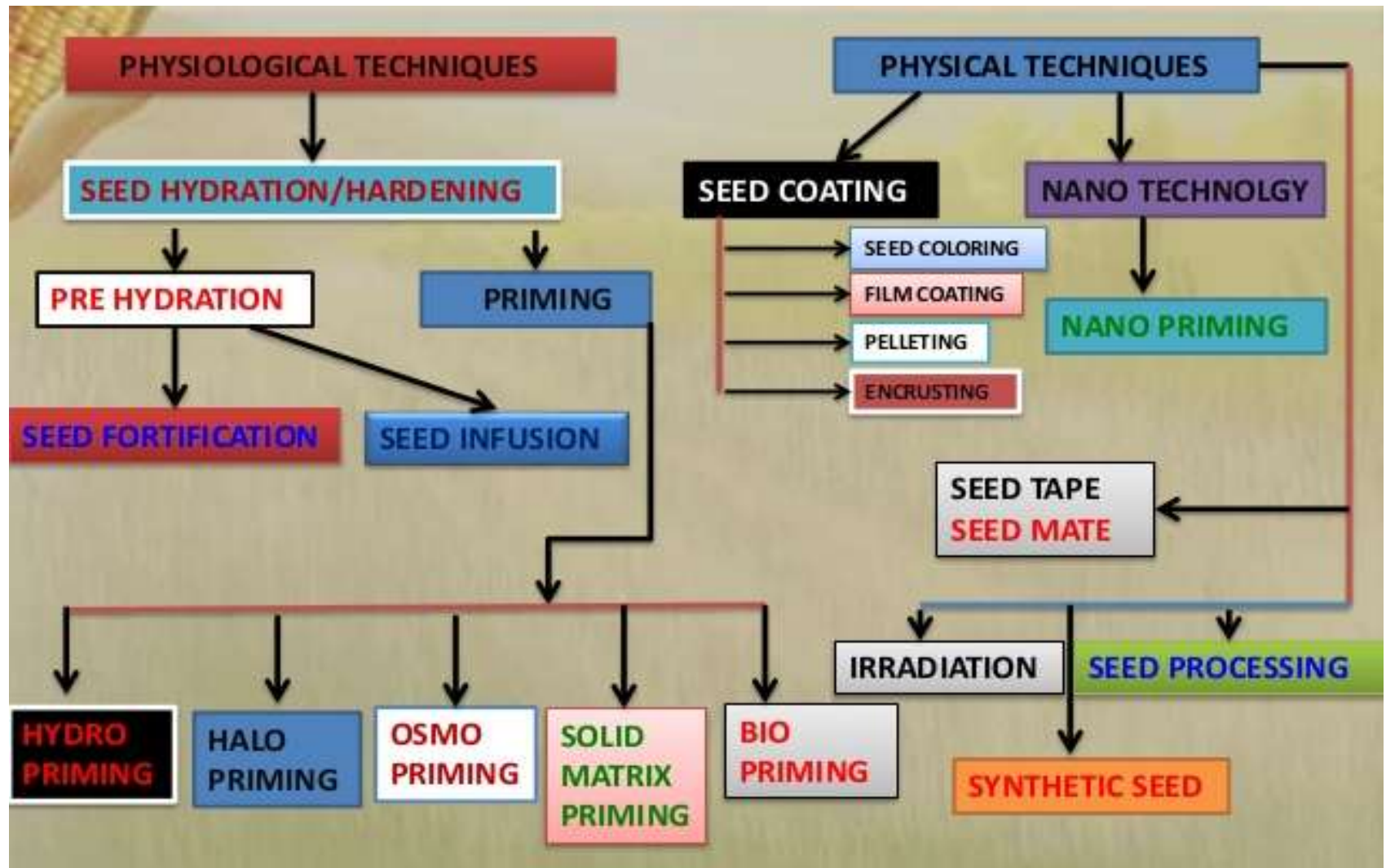
Practice Section-I

Objectives of seed quality enhancement, Seed enhancement techniques, Seed treatment, Equipments for seed treatment, Main groups of chemical formulations used as seed treatment, Techniques of seed priming, Seed pelleting and pelleting materials, and Seed pelleting process

Objectives of Seed Quality Enhancement

- ❖ Reduced seed rate
- ❖ Improve germination/seedling growth through manipulation of seed vigour or physiological status of the seed
- ❖ Facilitate seed planting (Pelleting, Coating and Encrusting)
- ❖ Deliver the materials (other than pesticides) needed at sowing (e.g. nutrients, inoculants)
- ❖ Remove weak or dead seeds using nontraditional upgrading techniques (density, color, sorting)
- ❖ Tagging of seeds with visible pigments or other materials/markers for traceability and identity preservation

Seed Enhancement Techniques



Seed Treatment

❖ Higher yield

Often pays for itself

Improved crop quality

A safeguard against disease

Pest protection with lower environmental impact

A smart way to apply anti-pest products

Smooth machinery operation

Easier handling



Seed Treatment

1. Physical seed treatment:

- a. Radiation
- b. Temperature
- c. Magnetic
- d. Microwave
- e. Controlled Gaseous Atmosphere etc.

2. Chemical seed treatment:

3. Pesticidal seed treatment:

- a. Seed coating with chemical protectant
- b. Seed pelleting
- c. Seed priming

4. Advance seed treatments: Sound treatment, Ultra-sound treatments, Electric field, Laser seed treatment, Endophyte seed treatment, Pollinator plus, Intelligent seed coating etc.

Equipments for seed Treatment



2. Direct treater

- Panogen and Mist o matic treater
- The "mist-o-matic" treater applies chemical as a mist directly to the seed.
- The treater is equipped with a large treatment tank, a pump and a return that maintains the level in the small reservoir from which the seed is fed.



1. Slurry treaters

- A slurry is prepared by mixing the chemical with water.
- The treatment material to be applied as slurry is accurately measured through a simple mechanism comprised of a slurry cup and seed dump pan.
- The cup introduces a given amount of slurry with each dump of seed into a mixing chamber where the seeds are mixed thoroughly.



4. Grain Auger

- ❖ Liquid materials can be dripped on the seed as they enter a grain auger or straw conveyer.
- ❖ By the time seeds have left the auger the chemical is spread on the seeds.

5. Shovel

- ❖ Seeds are spread on a clean dry surface 10-15 cm in depth.
- ❖ The proper amount of chemical is diluted with water and sprinkled over the seed.
- ❖ Mixing is done with shovel or sloop turning the seed at least 20 times.

3. Drum Mixer

- A simple mixer can be made by running a pipe through a drum at an angle.
- The drum is then mounted onto a stand.
- The seed and treatment are placed in the drum and it is rotated slowly until all the seeds are cornered with the chemicals.



Main groups of chemical formulations used as seed treatment

- Solid formulations

- DS – dust
- WS - wettable powder
- WG - wettable granules



- Liquid formulations

- FS – flowable
- ES - emulsified concentrate
- LS - organic solvent based
- CS - capsule suspension



Plastic bag



Hege type
seed treatment



Continues treater

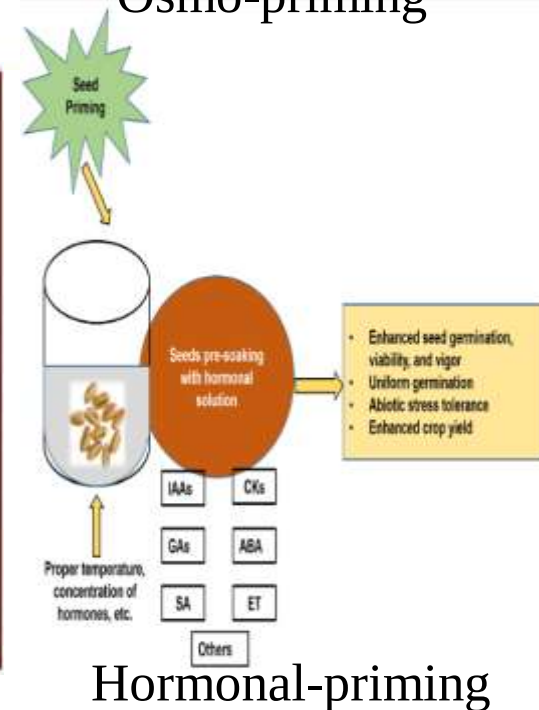
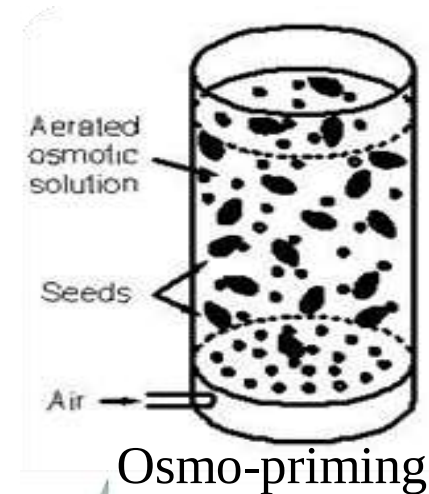


Batch treater



Techniques of seed priming

1. Hydro-priming
2. Halo-priming
3. Osmo-priming
4. Matrix priming
5. Osmohardening
6. On farm priming
7. Hormonal priming
8. Micronutrient seed priming (Nutri-priming)
9. Bio-priming or seed treatment with micro-organisms, e.g. *Pseudomonas aureofaciens*, *Trichoderma spp.* etc.
10. Nanoparticle priming or coating seeds with nanoparticles (NPs)



Seed pelleting and seed pelleting materials

Seed pelleting is the process of enclosing a seed with a small quantity of inert material just large enough to facilitate precision planting or It is the mechanism of applying needed materials in such a way that they affect the seed or soil at the seed soil interference (Halmer,2006)

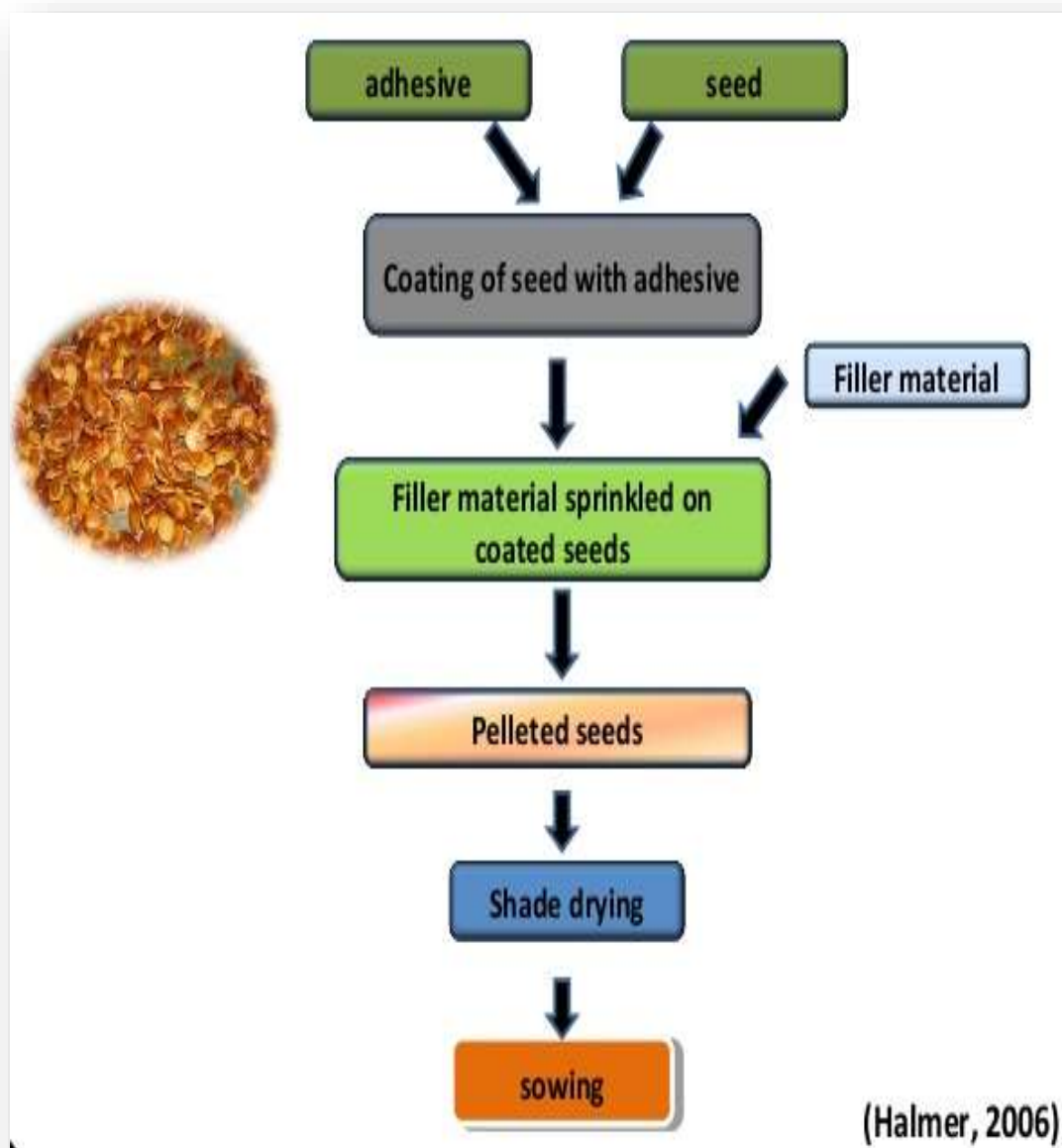
FILLER MATERIALS

- Clay
- Limestone
- Calcium carbonate
- Vermiculate
- Tamarind leaf powder

ADHESIVE

- Gum Arabic
- Gelatin
- Methyl cellulose
- Polyvinyl alcohol
- Media/starch gruel

Seed pelleting process





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Thank
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