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Session 52: Seed Treatment



Seed Treatment

The term "treated" means "to give an application of a pesticide or subject seed to a process designed to reduce, control or repel disease organisms, insects, or other pests which attack the seed or seedlings

Seed treatment is defined as the application of fungicide, insecticide, bio-fertilizer or any other growth regulators either to control the pathogens or insects or to improve the germination potential

Seed treatment is a biological, chemical, mechanical or physical processes design to mitigate the seed borne pests to improve the quality of seed

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

Historical Background

MANUSMRITI, a 500 year old Indian scripture, good seed in good soil gives abundant yields

Surpala's Vrikshayurveda (800AD) recommend that seeds be steeped in milk and rubbed in cow dung, dried and then repeatedly rubbed in honey mixed with powder of Vidanga (*Emelia ribis*), for good yields

Tull (1973) found that in England white normal seeds gave wheat crops infected with bunt, seeds accidentally soaked in sea water gave a healthy yield. This gave practice of treating wheat seeds with brine water.

Siddiqui et al., 1987 were able to control Downy mildew of pearl millet caused by *Sclerospora graminicola* by treating the seed with Apron, DS formulation of metalaxyl

Wainwright et al., 1994 found liquid or flowable formulation of tebuconazole and triazoxide for control of some seed borne disease of barley

Historical Background

A brief history of seed treatments for plant protection illustrates the practical need for better delivery systems and improved ability to sow seeds

In 1866, a technique was developed to improve sowing of cotton seed using a paste of wheat flour to form a pellet

During the mid-20th century, many coating technologies for improved agricultural productivity were developed and reviewed by Jeffs (1986)

Seed coating technology continued to advance through the 1970s to 1990s and reviewed by Taylor and Harman (1990), Scott (1989) and Hill (1999)

More recently the focus on seed enhancements, seed priming, seed pelleting, seed coating and seed colouring etc has been given an important areas of seed treatment in the 21st century

Seed Treatment Vs Spraying

Seed Treatment	Spraying
Local application	Treatment of whole area
Reduced application rate	Contamination of soil surface
Only crop/plant is treated	High application rate
Protection right from the time of sowing	Effects on surrounding vegetation
Taken up systematically by the plant	No protection from soil pests
Farmer save extra work and labor	Possible danger of spraying
No drift	Extra work and labor involved
	Potential risk of drift

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

Slurry treater

Direct treaters

Drum mixer

Grain auger

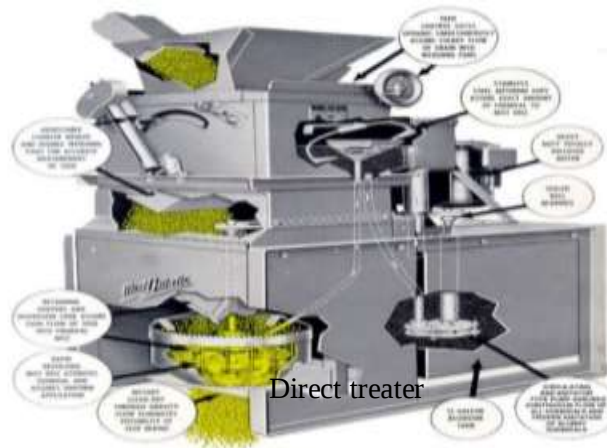
Shovel

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



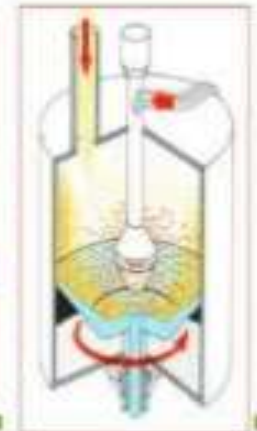
Hege type
seed treatment



Continues treater



Batch treater



Factors affecting seed treatment

Types of seeds

Types of crops

Types of seed treatment instruments

Dormancy of seeds

Types of insect pest and diseases

Environmental conditions

Advantages of seed treatments

Protects germinating seeds and seedlings against soil and seed borne pathogens/insects

Seed germination enhancement

Early and uniform establishment and growth

Enhances nodulation in legume crop

Better than soil and foliar application

Uniform crop stand, even in adverse conditions (less/high moisture)

Conclusion

➤ Seed is the primary source of agricultural input, hence seed treatment play important role on crop stand and good production that ultimately boost the farmer economy and living standard



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*Thank
you*

