JUST AGRICULTURE
multidisciplinary e-Newsletter

Seed Treatment: Methods, Objectives and Pre-Storage Treatment

Dr.Niharika Shukla, Dr.Pooja Chaturvedi, Dr.Yati Raj Khare and Dr.Neha Sharma
Krishi Vigyan Kendra, Jawaharlal Nehru Krishi Vishwa Vidhyalaya Jabalpur 482004

ARTICLE ID: 76

Introduction

Seed treatment is the mixing, coating, or soaking of protectants or chemicals, hormones, nutrients, nor growth regulators into seeds. They are exposed to a variety of energy (radiation, heat, electricity) in order to repel pests and other insects that attack seeds or seedlings. Controlling pests while the seed is in storage and after it has been sown/ planted is also part of seed treatment.

Objectives of seed treatment:

- Its main role is to protect seeds from *seed borne diseases* and pest attacks.
- To revive a seed that has been dormant for a long time.
- Drought tolerance is induced.
- Early emergence is used to increase the percentage of seeds that germinate.
- To keep birds and vermin out.
- Using X-rays, Gamma rays, and colchicines, obtain polyploides (genetic variety).

JUST AGRICULTURE
multidisciplinary e-Newsletter

Advantages of seed treatment

1. Protects germinating seeds and seedlings against soil and seed borne pathogens/insects.
2. Seed germination enhancement.
3. Early and uniform establishment and growth
4. Enhances nodulation in legume crop.
5. Better than soil and foliar application.
6. Uniform crop stand, even in adverse conditions (less/high moisture)

Different methods of seed treatment:

- **Dry treatment:** Mixing the seed with pesticides/nutrients in powder form.
- **Wet treatment:** Soaking the seeds in a pesticide/nutrient solution in liquid form.
- **Slurry treatment:** Seeds/seedlings are dipped in slurry. Rice seedlings, for example, are immersed in phosphate slurry.
- **Pelleting:** It is the process of coating seed with enough seed ingredients to make the seeds larger, heavier, and consistent in size for sowing using seed drills. Pesticide pelleting is used to protect soil organisms and pests, as well as to repel birds, ants, and rodents.

Procedure for Seed Treatment

Seed treatment is a term that describes both products and processes. Seed treatment can be done in one of the following types.

1. **Seed dressing:** This is the most common method of seed treatment. The seed is dressed with either a dry formulation or wet treated with a slurry or liquid formulation. Dressings can be applied at both farm and industries. Low cost earthen

JUST AGRICULTURE
multidisciplinary e-Newsletter

pots can be used for mixing pesticides with seed or seed can be spread on a polythene sheet and required quantity of chemical can be sprinkled on seed lot and mixed mechanically by the farmers.

2. **Seed coating:** A special binder is used with a formulation to enhance adherence to the seed. Coating requires advanced treatment technology, by the industry.
3. **Seed pelleting:** The most sophisticated Seed Treatment Technology, resulting in changing physical shape of a seed to enhance palatability and handling. Pelleting requires specialized application machinery and techniques and is the most expensive application.

Recommendation of seed treatment for different Field crops

Crop	Pest/Disease	Seed Treatment	Remarks
Sugarcane	Root rot, wilt	Carbendazim (0.1%) 2 g/kg seed *Trichoderma* spp. 4-6 g/kg seed	For seed dressing metal seed dresser / earthern pots or polythene bags are used.
Rice	Root rot disease	*Trichoderma* 5-10 g/kg seed (before transplanting)	-do-
	other insects/pests	Chloropyriphos 3g/kg seed.	
	Bacterial sheath blight	*Pseudomonas fluorescens* 0.5% W.P. 10 gm/kg.	
	Root knot nematode	Seed soaking in 0.2% of Monocrotophos for 6 hours	-do-
	White tip nematode	Seed soaking in 0.2% solution of Monocrotophos	-do-
Pigeon pea	Wilt, Blight and Root rot	*Trichoderma* spp. @ 4 g/kg. seed	For seed dressing metal seed dresser/earthern pots or polythene bags are used.
Pea	Root rot	Seed treatment with - *Bacillus subtilis* - *Pseudomonas fluorescens* Soil application @ 2.5 – 5 kg in 100 kg FYM or Carbendazim or Captan 2 g/kg seed	-do-
	White rot	Thiram + Carbendazim 2 g/ kg seed Carbendazim or Captan 2 g / kg seed	
Tomato	Soil borne infection of fungal	*T. viride* @ 2 g/100gm seed. Captan 75 WS @ 1.5 to 2.0 g a.i./litre for	For seed dressing metal seed

JUST AGRICULTURE
multidisciplinary e-Newsletter

	disease Early blight Damping off Wilt	soil drenching. *Pseudomonas fluorescens* and *V. clamydosporium* @ 10g/kg as seed dresser.	dresser/earthern pots or polythene bags are used.
Sunflower	Seed rot	*Trichoderma viride* @ 6 g/kg seed.	-do-
	Jassids, Whitefly	Imidaclorprid 48FS @ 5-9 g a.i. per kg seed Imidacloprid 70WS @ 7 g a.i. per kg seed	
Wheat	Termite	Treat the seed before sowing with any one of the following insecticides. Chlorpyriphos @ 4 ml/kg seed or Endosulfan @ 7ml / kg seeds	For seed dressing metal seed dresser / earthern pots or polythene bags are used
	Bunt/False smut/loose smut/covered smut	Thiram 75% WP Carboxin 75 % WP Tebuconazole 2 DS @ 1.5 to 1.87 g a.i. per kg seed. *T. viride* 1.15 % WP @ 4 g/kg.	
Gram	Wilt and damping off	Seed treatment with *Trichoderma viridi* 1% WP @ 9 g/kg seeds Combination of Carbendazim with Carbosulfan @ 0.2% Carbendazim with Thiram with Carbosulfan @ 0.2% Treat the seed with Chlorpyriphos 20 EC @ 15-30 ml a.i./kg seed.	
Barley	Loose smut Covered smut Leaf stripe Termite	Carboxin 75% WP Thiram 75% WP @ 1.5 to 1.87 gm a.i./kg seed. Treat the seed with Chlorpyriphos @ 4 ml/kg seed.	

Pre storage seed treatment

Fungicide, insecticide, or a combination of both, as well as any other chemical or plant product, are applied to seeds prior to storage. The goal is to keep seeds fresh for longer by disinfecting them against seed-borne or seed-storage diseases and storage insects, as well as minimizing seed deterioration directly or indirectly.

Characteristics of ideal chemical seed treatment:

- It must be extremely effective in the face of harmful organisms.
- Seeds must be somewhat unaffected.
- Even if overused, it should be safe for humans, animals, and cattle.
- During seed storage, it should be relatively stable for a long time.
- It should be simple to operate.

JUST AGRICULTURE
multidisciplinary e-Newsletter

- It should be economically competitive.

Types of pre-storage seed treatment:

Seed disinfection:

Seed disinfection refers to the removal of fungal and bacterial spores that have established themselves in the seed coat (or) in deeper tissues. Fungicidal treatments must reach the seed to kill the fungus that is there for effective control.

Seed disinfestations:

Seed disinfectants refer to the destruction of surface-borne organisms that have contaminated the seed surface but not infected the seed surface. Application of chemicals through chemical dips, soaks, *fungicides,* or pesticides applied as dust have been found successful.

Seed protection:

The main purpose is to protect the seed and young seedlings from organisms in the soil, which might otherwise cause decay of the seed before germination.