

Importance of Seed Treatment in Field Crops

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INTRODUCTION

Seed treatments provide farmers with an economical and environmentally sound means by providing protection for the seed and seedlings against disease and insect pressure from the moment they are planted. There are hundreds of pathogens and insects that can damage or even kill the seed or seedlings before they even have a chance to develop, which can negatively influence the crop's progress throughout the growing season and have a major impact on the yield. Seed treatment results in stronger and more uniform stands, healthier plants and higher crop yields. The yield of crops can be increased by seed treatment and the losses due to pest diseases outbreaks in crops can be reduced by 10 to 15 percent.

What is a seed treatment?

Seed treatments are defined as the precise application of chemical or biological substances to seeds or vegetative propagation materials (bulbs, corms, or tubers) to control disease causing microorganisms, insects, or other pests. Commonly used seed treatments are insecticides, fungicides and bactericides.

Categories of seed treatments

Seed treatments categories for crop disease management incorporate 1) Seed protection, 2) Seed disinfestation, and 3) Seed disinfection. Seed protection could be a biological, chemical, physiological or combination treatment planned to protect the seed and seedling from pathogenic microorganism within the soil. Seed disinfestation treatments are outlined moreover to control spores and other structures of pathogens on the surface of seeds. Seed disinfection treatments look for eliminate pathogens that have penetrated into living cells of the seed, infected it and have become established. Agro-chemical mixtures also may be supportive in disinfection. The treatment should control the pathogen, but ideally should not affect the embryo or emergence potential of seed.

Benefits of seed treatment

Seed treatments play a critical role in agriculture and the production of healthy crops. Because very small quantities of active-ingredients of pesticides is applied to non-target sites, or to non-target organisms. Seed treatment selectively control pests; thus, they are not harmful to beneficial organisms. Their safe and targeted use provides an efficient use of pesticides and reduces the amount of chemicals. However, the benefits of seed treatments can be short-lived, or the efficacy of seed treatments can be low if pest pressure is extremely high.

Chemical seed treatment for major field crops

Chemical (fungicide and bactericide) seed treatments help control soil-borne and seed-

borne pathogens that cause seed decay, seedling blight, root rot and seed-borne diseases. Control of these diseases may result in better stands, more vigorous seedlings, and increased yields. Always keep in mind that while treating seed, first treat with fungicide, then with pesticide chemicals and finally biofertilizer culture. This sequence of seed treatment is of great importance while doing seed treatment. Following seed treatments details are as per the pesticide label claim approved by Central Insecticides Board Registration Committee (CIBRC), Faridabad (Haryana) for their commercial use in the country.

Crops	Diseases	Fungicides	Application Rate (per kg of seed)
Cotton	Root rot, bacterial blight	Carboxin 37.5% + Thiram 37.5% WS	3.5 g
	Seedling disease	Fluxapyroxad 333 g/l FS	1.5 ml
	Seedborne disease	Thiram 75% WS	3 g
	Angular leaf spot	Carboxin 75% WP	2- 2.5 g
Groundnut	Collar rot	Thiram 75% WS	
	Collar rot, seed rot, root rot, stem rot	Carboxin 37.5% + Thiram 37.5% WS	3 g
	Seed and seedling rot	Penflufen 13.28% + Trifloxystrobin 13.28% FS	1 ml
	Stem rot	Thiophanate Methyl 450g/l + Pyraclostrobin 50g/l FS	2- 2.5 g
	Collar rot, stem rot	Tebuconazole 2 % DS	1 g
	Collar rot, dry root rot, tikka leaf spot	Carbendazim 25%+ Mancozeb 50% WS	3 g
Maize	Downy mildew	Metalaxyl 35% WS	7 g
	Seedling blight	Thiram 75% WS	3 g
	Seed rot, seedling blight	Carbendazim 25% + Mancozeb 50% WS	3 g
Mustard	White rust	Metalaxyl 35% WS	6 g
Pearl millet	Downy mildew	Metalaxyl 35% WS	6 g
Pigeonpea	Seed rot, root rot, stem rot, fusarium wilt	Carboxin 37.5% + Thiram 37.5% WS	4 g
Chickpea	Dry root rot, collar rot	Carbendazim 25% + Mancozeb 50% WS	3 g
Black gram	Root rot, collar rot	Carbendazim 25% + Mancozeb 50% WS	3 g
Paddy (Rice)	Brown Spot, seedling blast, sheath blight	Carbendazim 25% + Mancozeb 50% WS	3 g
	Blast, sheath blight, aerial phase	Carbendazim 50% WP	2 g
	Bacterial leaf blight	Streptomycin Sulphate 90% + Tetracycline Hydrochloride 10% SP	40 ppm solution (before sowing soak seeds for 12 hours)
Sorghum	Downy mildew	Metalaxyl 35% WS	6 g
	Grain smut	Sulphur 80% WP	3-4 g
		Carbendazim 50% WP	2 g
	Seedling blight, loose smut	Thiram 75% WS	3-4 g
	Anthracnose	Fluxapyroxad 333 g/l FS	1 ml
Soybean	Collar rot, charcoal rot and other seedling diseases	Carboxin 37.5% + Thiram 37.5% WS	3 g
	Rhizoctonia root rot	Fluxapyroxad 333 g/l FS	1 ml
	Seed and seedling rot	Penflufen 13.28% + Trifloxystrobin 13.28% FS	1 ml
	Seedling rot	Thiophanate Methyl 450g/l + Pyraclostrobin 50g/l FS	2- 2.5 g
	Root rot, collar rot	Carbendazim 25% + Mancozeb 50% WS	3 g
Sunflower	Downy mildew	Metalaxyl 35% WS	6 g
Wheat	Bunt, flag smut, loose smut	Carboxin 75% WP	2-2.5 g
		Tebuconazole 2% DS	1 g
		Thiram 75% WS	3 g
	Loose smut	Triticonazole 80 g/l + Pyraclostrobin 40 g/l FS	1 g
		Carboxin 37.5% + Thiram 37.5% WS	3 g
		Carboxin 75% WP	2.5 g
		Tebuconazole 2% DS	1 g
		Tebuconazole 5.36% FS	0.28 g
		Carbendazim 50% WP	2 g
	Loose smut, seedborne and soilborne disease	Carbendazim 25% + Mancozeb 50% WS	3 g

Seed treatment not only to kill fungi and pests but also to provide higher yields of the crop. Thus, seed treatments should be considered as tools in an integrated pest management plan.

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