

Safflower

Phytophthora Root and Stem Rot

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Identification and Life Cycle

Phytophthora root and stem rot of safflower is caused by several fungus-like organisms in the genus *Phytophthora*, including *P. cactorum*, *P. cryptogea*, *P. drechsleri*, and *P. nicotianae* var. *parasitica*. These pathogens survive in infested crop residue and soil as dormant spores (oospores). Plants may be infected at all growth stages, but the disease is most severe with warm, wet soils, especially in fields irrigated by flooding. Water stress predisposes plants to infection.

Plant Response and Damage

Phytophthora root and stem rot symptoms appear first as a collapse of lower stems, which kills seedlings. On older plants, leaves become light green to yellow, wilt, and die. Infected roots are a reddish color, but become dark brown to black as disease progresses. Lower stems may also become dark brown or black as the disease progresses. Stem infections are much more damaging than root infections.

Biological Control

Biological control strategies have not been developed for Phytophthora root and stem rot.

Cultural Control

Plant varieties with some degree of resistance to Phytophthora root and stem rot. Avoid planting safflower in poorly drained fields. Carefully manage irrigation water to avoid ponding; planting into raised beds can improve drainage near plant roots.

Chemical Control

Seed treatment may provide some protection of seedlings from infection, but are most effective when combined with sound cultural practices.

Product List for Phytophthora Root and Stem Rot:

Pesticide	Rate per 100 lb seed	Application Frequency (days)	Remarks
Captan			
Captan 75	6-9 oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> and <i>Phytophthora</i> spp.
Captan 30-DD	1.25 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> and <i>Phytophthora</i> spp.
Captan 400	1-2 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> and <i>Phytophthora</i> spp.
Captan 400-C	1-2 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> and <i>Phytophthora</i> spp.
Carboxin and Carboxin + Thiram			
Vitavax 34	2 fl oz	Seed treatment	Suppression of <i>Rhizoctonia</i>
Vitavax 200	4 fl oz	Seed treatment	Broad spectrum
EBDC—several formulations available, but not all are listed			
Dithane M45	2 oz	Seed treatment	Broad spectrum
Fludioxonil			
Maxim 4FS	0.08-0.16 fl oz	Seed treatment	Suppression of <i>Fusarium</i> and <i>Rhizoctonia</i> spp.
Thiram			
42-S Thiram	8 fl oz	Seed treatment	Broad spectrum
Thiram 50WP	8 oz	Seed treatment	Broad spectrum

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Categories: Safflower, Disease, Phytophthora Root, Stem Rot

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