

Cole Crops

Damping-Off and Seedling Blight

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Identification and Life Cycle

Damping-off is caused by a complex of fungi, including *Rhizoctonia solani* and *Pythium* spp. Damping-off is associated with cool to warm soil temperatures, excess soil moisture, and delayed seedling emergence. Pathogens associated with damping-off are common soil inhabitants and can survive in soil as dormant oospores or sclerotia, pathogenically on alternate hosts and weeds, and saprophytically on crop residues.

Plant Response and Damage

Damping-off can occur before or after crop emergence. Pre-emergence damping-off results in a brown, gelatinous rotting within the seed coat. Radicles and cotyledons may become brown and soft after germination, but fail to emerge. Water-soaked, greasy lesions may also form on hypocotyls and roots after emergence when infected with *Pythium* spp., causing plants to collapse and wither. Post-emergence damping-off caused by *R. solani* begins as elliptically-shaped, brown to black sunken cankers on roots and hypocotyls with a sharp margin between infected and healthy tissue. Plants can become girdled and die, but lightly infected roots often survive and produce nearly normal roots.

Management Approaches

Biological Control

Kodiak (*Bacillus subtilis* strain GBO3) is registered for protection of roots from *Pythium* and *Fusarium* spp., but its efficacy in the High Plains is unknown.

Cultural Control

Encourage rapid seed germination and vigorous growth of seedlings by planting high quality seed in warm, well-prepared seedbeds. Avoid planting into cold soils, excessive irrigation, poor drainage, and compaction. Ensure crop residues from the previous crop are thoroughly decomposed before planting. Crop rotation with non-hosts (i.e., small grains) may provide some reduction in damping-off pathogens, but some damping-off and seedling blight pathogens have very broad host ranges and can attack most plants.

Chemical Control

Fungicides are most effective when two different seed treatments are used in combination with cultural control strategies.

Product List for Damping-Off and Seedling Blight:

Pesticide	Rate per 100 lb seed	Application Frequency (days)	Remarks
Azoxystrobin			
Quadris	0.4-0.8 fl oz/1000 ft	In-furrow spray	Suppression of <i>Rhizoctonia</i> spp.
Captan			
Captan 75	6-9 oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 30-DD	1.25 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 400	1-2 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 400-C	1-2 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Fludioxinil			
Maxim 4FS	0.08-0.16 fl oz	Seed treatment	Suppression of <i>Fusarium</i> and <i>Rhizoctonia</i> spp.
Metalaxyl/Mefenoxam			
Apron XL LS	0.085-0.64 fl oz	Seed treatment	Suppression of <i>Pythium</i> and <i>Phytophthora</i> spp.
Allegiance-FL	0.75-1.50 fl oz	Seed treatment	Suppression of <i>Pythium</i> and <i>Phytophthora</i> spp.

Ridomil Gold EC	1-2 pts	Pre-plant incorporated soil drench or soil band (a 7" band is recommended)	Suppression of <i>Pythium</i> and <i>Phytophthora</i> spp.
Ultra Flourish	2-4 pts	Pre-plant incorporated drench or 7" soil band	Suppression of <i>Pythium</i> and <i>Phytophthora</i> spp.
PCNB			
Terraclor 15G	125 lb	Planting time drench	Broadcast or apply in band or seed
Terraclor 75% WP	15-20 lb	Planting time drench	Broadcast or apply in band or seed
Terraclor Flowable	1.9-3.8 gal	Planting time drench	Broadcast or apply in band or seed
Thiram			
42-S Thiram	8 fl oz	Seed treatment	Broad spectrum
Thiram 50WP	8 oz	Seed treatment	Broad spectrum
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Categories: Cole Crops, Disease, Damping Off, Seedling Blight

Date: 04/01/2007