

# Onion

## Damping-Off and Seedling Blight

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### Identification and Life Cycle

Death of seedlings before and after emergence can be caused by various species of *Pythium* and *Fusarium*. Older reports also claim that *Rhizoctonia* species can be involved.

Damping-off is associated with cool 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 spores and pathogenically on alternate hosts and weeds. Roots are killed directly or weakened and predisposed to additional damage by other stress factors such as cold, wet soil, compaction, herbicides, and salts from alkaline soil or fertilizer. Damping-off pathogens are easily disseminated in irrigation water, contaminated soil on equipment, and movement of infected plant materials.

### 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 wilt. Plants are often infected at the soil line or slightly below. Root systems of seedlings and transplants are rotted by these fungi or damaged by nematodes. Plants can also wilt suddenly; and healthy-appearing plants can suddenly collapse during the heat of the day. After several days, plants permanently wilt. Seedlings can be killed, while others may survive and recover as plants develop.

### Management Approaches

#### Biological Control

Deny (*Burkholderia cepacia*) is registered for protection of roots from *Fusarium*, *Rhizoctonia*, and *Pythium* spp. Kodiak (*Bacillus subtilis*) is also registered. The efficacy of these products in the High Plains is unknown.

## Cultural Control

Practice a three-year or longer rotation to non-hosts such as small grains and corn. Transplants should be used instead of seed in infested soil. Plant high quality seed in warm, well-prepared seedbeds under conditions favorable for rapid seedling emergence; shallow planting can encourage rapid emergence. Avoid excess irrigation and poor drainage, soil compaction, high herbicide rates, and other factors that delay emergence. Planting into raised beds can help avoid water-logging and promote more rapid germination. Crop rotation with non-hosts (i.e., small grains) may provide some reduction in damping-off pathogens, but damping-off and seedling blight pathogens have very broad host ranges and can attack most plants.

## Chemical Control

Chemical controls are most effective when combined with sound cultural practices. Only seed treated with a fungicide should be planted.

### *Product List for Damping-Off and Seedling Blight:*

<b>Pesticide</b>	<b>Rate per 100 lb seed</b>	<b>Application Frequency (days)</b>	<b>Remarks</b>
<b>Azoxystrobin</b>			
Quadris	0.4-0.8 fl oz/1000 ft	Planting time treatment	Suppression of <i>Rhizoctonia</i> spp.
<b>Captan</b>			
Captan 75	6-9 oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 30-DD	1.33-2.33 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 400	1.5-3.0 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
Captan 400-C	1.5-3.0 fl oz	Seed treatment	Broad spectrum, but weak against <i>Pythium</i> spp.
<b>Fludioxinil</b>			
Maxim 4FS	0.08-0.16 fl oz	Seed treatment	Suppression of <i>Fusarium</i> and <i>Rhizoctonia</i> spp.

<b>Metalaxyl/Mefenoxam</b>			
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 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.
<b>Thiram</b>			
42-S Thiram	4.5 fl oz	Seed treatment	Broad spectrum
Thiram 50WP	4.5 oz	Seed treatment	Broad spectrum
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Categories: Onion, Disease, Damping-Off, Seedling Blight

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