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Plant Pathology Fact Sheet

Damping-off of Vegetables and Herbaceous Ornamentals

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Importance

Damping-off can occur on any herbaceous crop grown from seed, including vegetables, ornamentals, and field crops. Seeds, seedlings, and young plants may be affected, resulting in poor stands in home gardens, greenhouses, and commercial fields. Losses to damping-off can be severe, especially when cool, wet weather prevails at seeding or seed emergence.

POST-EMERGENCE DAMPING-OFF

Symptoms

Pre-emergence damping-off occurs when seeds decay prior to germinating or the germinating seeds fail to emerge from the soil; post-emergence damping-off occurs when seedlings collapse after emergence.

Disease symptoms are dependent on the time of infection. If damping-off occurs pre-emergence, infected seeds become soft, rotten, and fail to germinate. As a result, seedlings fail to emerge. If infection takes place after germination occurs, stems of germinating seedlings are infected and water-soaked lesions form at or below the soil line. As the disease progresses, these lesions may darken to brown, reddish-brown, or black. Expanding lesions quickly girdle young, tender stems. Seedlings may wilt and die soon after emergence.

Diseased seedlings which survive post-emergence damping-off and are planted into the field may continue to grow but with a constricted, wiry stem near the soil line. This condition, known as “wirestem,” is particularly common on crops in the cabbage family (crucifers). Plants with wirestem are stunted, off color, and less productive than healthy plants.

Cause and Disease Development

Damping-off may be due to one or more species of soil-borne fungi (e.g. *Rhizoctonia* and *Fusarium*) and fungus-like organisms (e.g. *Pythium* and *Phytophthora*). Occasionally other fungi, such as *Sclerotinia, Sclerotium,* and *Botrytis,* may also cause damping-off. Most of these pathogens are common in Kentucky soils and can be spread via:

- Water runoff from irrigation or rain
- Contaminated soil
- Introduction of infected plants
- Improperly sanitized greenhouse
- Irrigation water from ponds

Once established, organisms that cause damping-off diseases are able to survive for many years in the soil in the absence of host plants, either as saprobes (saprophytes) or as survival/resting structures that are capable of enduring adverse conditions. Their wide host range also aids in the longevity of these fungi and fungus-like organisms.

Factors that favor disease development include:

- Wet soils (e.g. due to poor drainage or overwatering)
- Cool soils
- Cool to moderate air temperatures

Disease Management

Prevention is the key to managing damping-off. The following cultural practices will help reduce the incidence of this disease:

- Use sterilized soil when planting seeds in pots or flats
- Disinfest tools, potting containers, and work benches used in seeding/transplanting operations
- Use seed treated with a fungicide to protect against seed decay
  - –Purchase seed that has already been treated
  - –Untreated seed can be dusted with a fungicide, such as Captan (1 teaspoon per pound of seed)
- Do not overwater
- Plant seed in the garden or field after the soil has warmed
- Plant in well-drained soils

There are some fungicide drenches or sprays available to help manage damping-off; however, these chemicals are only available for commercial floriculture producers. Other than seed treatments, there are no fungicides available for controlling damping-off on edible crops or for homeowner use.

Additional Resources

- Controlling Phytophthora Root Rot in Greenhouse Ornamentals
http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-OR-H-9.pdf
- Disinfection and Treatment of Vegetable Seeds (Appendix I) in Vegetable Production Guide for Commercial Growers, ID-36
http://www.ca.uky.edu/agc/pubs/id/id36/id36.htm
- Home Vegetable Gardening, ID-128
http://www.ca.uky.edu/agc/pubs/id/id128/id128.pdf
- Managing the Greenhouse Environment to Control Plant Diseases
http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-GH-1.pdf

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