

Phytophthora Root Rot

Phytophthora spp.

Host Plants

Arborvitae	Laurel
Barberry	Leucothoe
Birch	Leyland cypress
Blackgum	Lilac
Blueberry	Magnolia
Boxwood	Maple
Buckeye	Nandina
Butterfly-bush	Oak
Camellia	Ornamental cherry
Cedar	Pear
Chestnut	Pieris
Cotoneaster	Pine
Crabapple	Privet
Dogwood	Rhododendron
Elm	Spruce
Euonymus	Sweetgum
Fir	Sycamore
Forsythia	Willow
Hemlock	Wisteria
Holly	Yew
Honeylocust	Zelkova
Juniper	and more
Larch	

Introduction

The name *Phytophthora* means plant destroyer. *Phytophthora* is a soil-borne, fungus-like organism that infects and kills a range of nursery and landscape plants.

Pathogen and Disease Cycle

Phytophthora overwinters in soil. Extended periods of high soil moisture favor infection. Sporangia (sacs of spores) cause new infections by germinating directly and colonizing roots or by releasing many zoospores (motile spores) that formed inside the sporangium into water. *Phytophthora* spreads via contaminated water (amounts as small as droplets) or soil (including reused media and pots). Recent studies have found that the pathogen can also be spread by fungus, gnats and shore flies.

Monitoring

Look for symptoms during the growing season, when temperatures are high and plants are actively growing. Infected roots may be tan to brown to cinnamon; conifers may lack white root-tips. Many of the aboveground symptoms may be confused with a nutritional disorder or over or under watering. Have a diagnostic laboratory run tests to confirm the presence of this pathogen.

Symptoms

Phytophthora kills the roots and crown of infected plants. It reduces the volume of the roots, which limits the uptake of water and nutrients. A common symptom is wilted foliage, even when adequate moisture is present. Wilting causes a need to water more. Other symptoms include yellow or bronze foliage, branch dieback and poor plant vigor; death is often common.



Integrated Pest Management

CULTURAL CONTROL

Plant in raised beds with well-drained soil. Avoid over irrigating. Avoid planting too deep. Remove organic debris and soak containers in disinfectant or steam before reuse. See Adkins et al. (below) for disinfestation guidelines. Media should be stored on a concrete pad. Store containers on gravel or concrete. Recycled irrigation water should be tested and/or sanitized before reusing.

CHEMICAL CONTROL

Please refer to http://eppserver.ag.utk.edu/redbook/sections/trees_flowers.htm for the most up-to-date recommendations.

Resources

Photo credits: Amy Fulcher and Alan Windham, University of Tennessee

Adkins, C., G. Armel, M. Chappell, J.C. Chong, S. Frank, A. Fulcher, F. Hale, K. Ivors, W. Klingeman III, A. LeBude, J. Neal, A. Senesac, S. White, and A. Windham. 2010. Pest management strategic plan for container and field-produced nursery crops in GA, KY, NC, SC, TN. A. Fulcher, ed. Southern Region IPM Center.

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Windham, A. 2007. Phytophthora diseases in ornamentals. The University of Tennessee/Agricultural Extension Service. What's Happening Newsletter (11). <http://eppserver.ag.utk.edu/Whats/wh2007/Issue-11-2007.pdf>

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