

Phytophthora crown and root rot

Several species of the *Phytophthora* fungus cause Phytophthora crown and root rot.



Host plants:

Phytophthora species cause crown and root rot on a number of trees and shrubs, but those most commonly infected include Japanese andromeda, azalea, Fraser fir, pine, and rhododendron.

Description:

Foliar symptoms caused by Phytophthora crown and root rot reflect the disruption of water and mineral uptake and/or transport by the infected plant. Affected leaves wilt (even when there is sufficient water in the soil), show early fall color, and are smaller than normal. In addition, shoot growth is often stunted and branches dieback.



Healthy azalea (left) - Discolored/stunted growth on azalea with root rot (right)



Browning and wilt in nursery field

Photos: D. M. Benson (left) and H. A. J. Hoitink (right), *Diseases of Woody Ornamentals and Trees*. APS Press.

Infected cambium at the root crown is tan to reddish brown instead of white. Below ground, look for brown roots and an absence of fibrous feeder roots. Close examination often reveals an abundance of fine healthy in the upper soil layers, but finds few if any roots below that level.

Disease cycle:

The *Phytophthora* species that cause crown and root rot live in the soil. They thrive in wet as well as low-oxygen soil conditions. Compaction of soil depletes oxygen and waste gas movement to the roots, which inhibits normal root functions making them more vulnerable to infection. Puddles of water and saturated soil stimulate germination of *Phytophthora* spores that splash onto wounds or directly invade roots. Once the plant is infected, the fungus survives as resting spores in infected plant debris in the wet soil.

Management strategies:

No single intervention controls Phytophthora crown and root rot. Use a combination of cultural measures, plant resistance, and perhaps, chemical treatment. Minimize puddling and correct any soil drainage problems around plants. Avoid moisture extremes, where the plants become too dry or the soil is too wet. Maintain a 2-3 inch layer of composted bark mulch over the root zone. Promptly remove infected plants along with 4-5 inches of soil from around the circumference of the root ball. If replanting on the site, correct any soil drainage problems before doing so. The soil on the sides of the hole may be drenched with a registered fungicide before replanting. Select *Phytophthora*-resistant replacements when replanting in a landscape with a history of Phytophthora crown and root rot.

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UMass Extension Landscape, Nursery & Urban Forestry Program - Fall 2005

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