

Phytophthora

Glynn Percival, PhD, Plant Physiology

Identification, Biology & Management

Phytophthora root rot is a widespread disease of landscape plants. The name *Phytophthora* is a Greek word literally meaning “plant destroyer”. These pathogens grow in the cambium and sapwood causing death of the tissue. Loss of water and nutrient absorbing capacity and stored carbohydrate reserves in the root cause a gradual, or sometimes-rapid decline of the above ground portion of a tree.

Symptoms

Symptoms of *Phytophthora* root rot vary depending on the susceptibility of the plant species, the virulence of the specific *Phytophthora* species and site/environmental conditions. Symptoms include a reduction in shoot growth; small leaves, thinning of the crown, chlorosis, twig and branch dieback, bleeds on the stem/tree trunk (Figures 1-2) and eventually death. Diseased roots are reddish brown and brittle. These symptoms are often confined to fine roots and lateral roots less than 1 mm in diameter. Decline occurs over a period of months or years eventually leading to death.

Rapid wilting and death of the entire plant characterize the acute form of the disease. Leaves turn red then brown and usually remain attached. Affected fine and large roots are reddish brown and brittle. *Phytophthora* lesions may extend into the root collar, which causes girdling of the stem and rapid collapse of the crown.

Causal Agents

Several species of *Phytophthora* attack woody ornamentals. The pathogen *P. cinnamomi* commonly causes root rot while *P. cactorum* attacks root collars and stems. As *Phytophthora* are water molds diseases are most common on soils that are poorly drained or receive excessive irrigation i.e. newly developed sites where the

soil is severely disturbed or compacted from construction activities. *Phytophthora* is also a common disease in nurseries. Decline and death of new plantings may result from out-planting of diseased stock.

Figure 1: *Phytophthora* infection of horse chestnut



Hosts

Phytophthora is common on the following species: Azalea, Rhododendron, English oak, Boxwood, Hemlock, Laurel, Dogwood, Fir, Camellia, White Pine, Holly, Yew.

Trees with soil or mulch covering their root collar are very susceptible to rot.

Figure 2: Canker on infected branch



and/or soil drenches to stimulate tree vitality. Research trials world-wide show phosphites highly beneficial in the suppression of this disease. Treating surrounding susceptible plants on a preventative basis is also recommended

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Control

Where soils are poorly drained and prone to flooding, use species that are tolerant to waterlogged/flooded soil conditions.

Ensure the root collar is exposed and free of soil and mulch.

If the soil is compacted, prepare the planting area by cultivating and incorporating organic matter.

Avoid excessive mulch on susceptible tree species. A 5 cm maximum mulch depth is recommended. Favour coarse mulches such as bark nuggets or wood chips. Avoid shredded bark products that tend to compact and hold water.

Use soil moisture probes to monitor soil moisture conditions.

Fungicide drenches will effectively minimize damage from *Phytophthora* root rot if applied at the proper intervals with good coverage. Drenches should be applied twice annually, or three times if the tree is heavily infected, across spring, summer, and autumn. These can be applied in conjunction with phosphite sprays