

47. *Phymatotrichum* Root Rot

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Phymatotrichum root rot is a major disease of tap-rooted plants in certain areas of the southwestern United States.

Hosts and Distribution

The fungus *Phymatotrichum omnivorum* has a wide host range that includes most of the species used in Great Plains tree plantings. It affects several tree species in parts of Arizona, Oklahoma, and Texas, where it is particularly damaging to cotton (fig. 47-1).

Symptoms and Signs

Diseased seedlings seldom show pronounced advanced indications but die suddenly, with a typical darkening and wilting of the leaves. Older trees may at first show a reduction in growth and vigor. The leaves may become yellow to bronze and either gradually drop off, giving the crown a thin appearance (cottonwood), or they may remain attached, become dark, dry, curl up, and cling abnormally long to the branches (Russian-olive).

Infected roots commonly are rotted and the epidermis is shrunken and shrivelled. For a few species such as Siberian elm, however, the decay has the characteristics of a wet rot.

Disease Cycle

The fungus has three distinct stages. The sterile mycelium usually appears in the form of buff-colored strands composed of one or more large central hyphae and surrounded by a varying number of small, irregular, thick-walled hyphae. Sclerotia are small, buff, compact bodies ranging up to a grain kernel in size. They are produced from enlargements of the rhizomorphs and, like the rhizomorphs, may remain dormant indefinitely. The spore stage appears on the surface of the soil in the form of a fluffy white mat of mycelia. The mat may be from 1 to 12 inches in diameter. The spore stage generally is considered functionless; infection has not been obtained by inoculations with spore suspensions.

The fungus in any form survives freezing for only a day or two; it is restricted to a region bounded on the north roughly by the latitude of southern Oklahoma.



Figure 47-1. Cotton killed by *Phymatotrichum omnivorum*.

Damage

The fungus is commonly found in patches in field crops such as cotton (fig. 47-1). The most damage occurs where trees have been planted in patches where the fungus has infested the soil. Windbreaks established in areas where the patches occur commonly have gaps where the fungus has killed or reduced the vigor of the trees (fig. 47-2).

Control

The impact of this disease can be reduced either by avoiding infested areas when planting trees and/or by planting resistant species. Infested spots could be detected readily when cotton was the crop most commonly planted, but now they are more difficult to detect because resistant crops, such as milo, are widely planted in the *Phymatotrichum* root rot zones of Oklahoma and Texas. In the early 1940's an evaluation of tree species in some Oklahoma and Texas windbreaks revealed that the following species were resistant: common hackberry, desert-willow, western soapberry, eastern redcedar, and Rocky Mountain juniper. The following species were intermediate in susceptibility: ailanthus, apricot, green ash, northern catalpa, American sycamore, French tamarisk, eastern black walnut, Russian mulberry, and Austrian pine.

Selected References

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Figure 47-2. Gap in windbreak caused by *P. omnivorum*.