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HOW TO

IDENTIFY AND CONTROL PHOMOPSIS BLIGHT OF JUNIPERS



U.S. DEPARTMENT OF AGRICULTURE • FOREST SERVICE
Southeastern Area, State and Private Forestry

Forestry Bulletin SA-FB/P 25 September 1980

HOW TO IDENTIFY AND CONTROL PHOMOPSIS BLIGHT OF JUNIPERS

Phomopsis blight is caused by the fungus, *Phomopsis juniperovora*. It primarily causes losses to nursery seedlings, although it can occur less seriously on older plants. Epidemics in nurseries have resulted in total losses. Phomopsis blight is widespread, occurring from the Great Plains to the Atlantic coast in 30 States. It has also been found on the Pacific Coast.

*Susceptible Species**

Rocky Mountain juniper
Eastern redcedar
Arizona cypress

*Losses have been most severe in these species, but other species in the Cupressaceae family are also hosts.

Identification

Tips of branches affected by *P. juniperovora* first turn brown, then progressively die back until a branch or possibly even the entire seedlings is killed (figure 1). The fungus grows through the needles into the stems and causes cankers which eventually girdle the stem. Older plants usually are not seriously affected, because only stems 1/3-inch or less in diameter are girdled.



Figure 1.—Progressive dying back of nursery seedlings caused by *Phomopsis juniperovora*.

Young, juvenile foliage is susceptible to infection throughout the growing season. Small yellow spots appear on the needles of eastern redcedar and Rocky Mountain juniper 3 to 5 days after infection. The fungus rapidly invades stem tissue, causing terminals and branches to become first light in color, then red-brown and finally ashen gray (figure 2).



Figure 2.—Foliage infected by *Phomopsis juniperovora*.

In advanced stages of infection, small black structures, called fruiting bodies may be found on the affected plant parts. The fruiting bodies are initially embedded in the needles and stems, but later partially emerge through the outer layer of the plant. The fruiting bodies are not well developed until the infected tissues have dried considerably (figure 3).



Figure 3.—Fruiting bodies on dried, ashen grey tissue.

Spores produced in the fruiting bodies can infect more trees once they are released. The fruiting bodies formed on seedlings infected the previous year are the most important source of spores early in the growing season. During wet weather spores ooze out of the fruiting bodies in whitish tendrils and are spread by water splash, insects, and people (figure 4.)

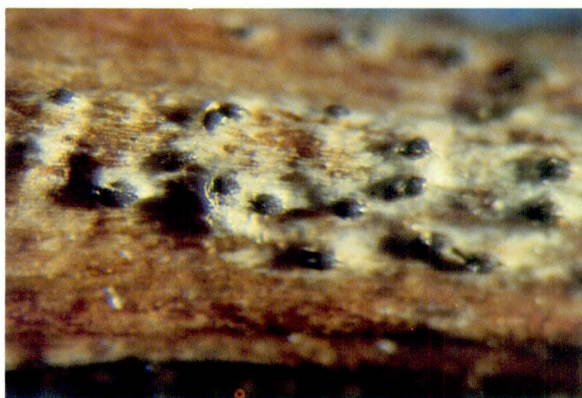


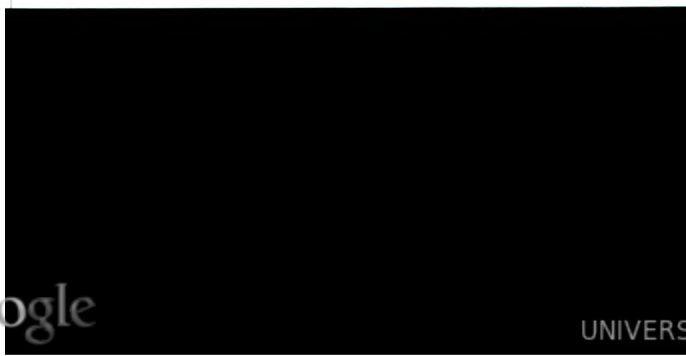
Figure 4.—Fruiting bodies.

Two types of spores (called alpha and beta) are produced. Both types are colorless and composed of a single cell. The alpha spores are ellipsoid, contain two oil globules, and are twice as long as they are wide. The beta spores are long, filamentous, and slightly curved. Intermediate spore types are common. Infection is caused by the alpha spores. The beta spores do not germinate, but they are an important key to proper identification of *P. juniperovora* (figure 5).



Figure 5.—Alpha spores and beta spores of *Phomopsis juniperovora*. The alpha spores contain two oil globules.

Damage from drought may be confused with phomopsis blight because, in both cases, the tips of branches are killed. The line of demarcation between green and dead tissue is sharp in phomopsis-blighted seedlings and gradual in seedlings suffering from drought. Damage from the lesser cornstalk borer can be distinguished from phomopsis blight by the straw color of the tops and the borer feeding wounds on the



lower stem and taproot. The fungus *Cerocospora sequoiae*, also causes a blight of junipers. However, *Cerocospora* infection starts on the oldest needles of lower branches, spreading upward and outward, while phomopsis affects the youngest needles first. Progressive dying back of seedlings can indicate any of several problems; careful diagnosis is necessary, usually including laboratory tests, to distinguish phomopsis blight.

Control

Seedlings and transplants need protection during the entire growing season because susceptible tissue is present and spores are released throughout the period. Fungicidal sprays need to be applied beginning when the first growth appears and followed with applications at 7- to 10-day intervals to keep the new foliage covered.

Though bordeaux mixture has frequently been recommended for control of Phomopsis blight, it is ineffective. Benomyl is effective and is EPA registered for Phomopsis blight control. Benomyl should be applied commercially in the ratio of 1 pound per 100 gallons (120gm/100D). In addition to fungicidal sprays, several management procedures are useful in reducing the incidence of phomopsis blight. Seedbeds should be well drained; ditch irrigation is preferable to overhead sprinkling to reduce spore transfer by water splash. Shading frames should be used only when necessary, because they lengthen the amount of time moisture remains on foliage. Junipers or other hosts should not be used in nursery windbreaks or in landscape plantings on nursery grounds, because they can be a source of infection.

For additional help, contact your State Department of Natural Resources, Forestry or Plant Pathology Extension Services, or State Department of Agriculture, Plant Industry Division.

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