

50. Phomopsis Blight of Junipers

Glenn W. Peterson

Phomopsis blight has been a serious problem for more than 75 years in nurseries producing juniper seedlings and grafts (fig. 50-1).

Hosts and Distribution

Phomopsis juniperovora, the fungus causing this disease, is widespread in the Great Plains (fig. 50-2). Losses have been most severe in seedling and transplant beds of eastern redcedar and Rocky Mountain juniper. Other junipers are susceptible, as are some species in the genera *Chamaecyparis*, *Cupressus*, and *Thuja*.

Symptoms and Signs

P. juniperovora initially infects foliage, then spreads to and sometimes kills stem tissues. Newly developing needles are especially susceptible while they are still in the yellowish-green stage; after needles become a normal, deep green, they are no longer susceptible. Small yellow spots appear on young needles of eastern redcedar and Rocky Mountain juniper within 3 to 5 days after infection. The fungus ramifies within infected needles and rapidly invades and girdles young stems. When a side shoot is infected, the fungus progresses to the main stem, which it may girdle if the stem is less than 1 cm in diameter. The portion of the seedling above the girdled area then dies.



Figure 50-1. Phomopsis damage in juniper seedbeds.

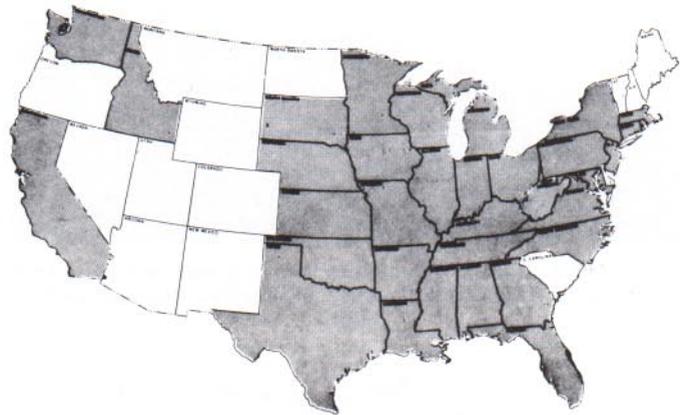


Figure 50-2. States in which *P. juniperovora* is present (gray).

At first, infected tissues turn light green but rapidly change to the characteristic red-brown color of dead shoots, which finally turn ashen gray. Lesions on larger stems frequently develop into cankers, but the stems are not girdled. The fungus does not spread far below the cankers.

Disease Cycle

Spores produced in fruiting bodies (pycnidia) formed on leaves and stems of seedlings infected the previous year are the most important source of inoculum early in the growing season. Pycnidia with viable spores may develop within 3 to 4 weeks after seedlings become infected, but usually are not well developed until infected tissues have dried considerably. Pycnidia are found most commonly on tissues that have turned ashen gray. The pycnidia are embedded at first in needles and stems, but partially erupt through the epidermis (fig. 50-3). Two types of spores (alpha and beta) develop in the same or different pycnidia (fig. 50-4) and are extruded in whitish tendrils. The alpha spores are colorless, one-celled, ellipsoid, contain two oil globules, and commonly are 7.5 to 10 by 2.2 to 2.8 μm ; the beta spores are colorless, one-celled, filamentous, slightly curved, and commonly 20.2 to 26.9 by 1 μm . The fungus can produce spores for as long as 2 years in dead parts of infected plants.

Spores are dispersed primarily by rain splash. Infection is caused by alpha-spores; the filamentous beta-spores do not germinate. Only a short period of high humidity is needed for infection to occur; for example, seedlings exposed to 100 percent relative humidity and 75°F for only 7 hours can become infected. Spore germination, germ-tube development, and infection are optimum near 75°F, but disease development is enhanced by higher temperatures (90°F).

Damage

Total loss of first-year seedlings is common in epidemic years if control measures are not used. Losses are particularly high in areas where water tends to stand, and in beds of new seedlings adjacent to infected older seedlings. Some of the worst epidemics occur late in the growing season, when there is a late flush of growth on juniper seedlings.

Survival of even lightly blighted nursery stock is very poor, because new shoots continue to be infected by spores produced on old infected tissues.

When junipers in landscape plantings become infected, they may become unsightly because of numerous dead branch tips (fig. 50-5). Older trees seldom are killed because only small-diameter stems are girdled. For this reason, Phomopsis blight does not cause significant damage in natural stands of junipers.

Control

Because susceptible new foliage and viable fungus spores are present throughout the growing season in juniper seedling beds, protective fungicides need to be applied regularly during this season. Benomyl is the only chemical currently registered for control of Phomopsis blight. This chemical applied at 7- to 10-day intervals, combined with a vigorous schedule of roguing infected seedlings over the same interval, will give excellent control.

Other actions can be taken to reduce losses. Sowing juniper seed adjacent to beds containing juniper stock should be avoided if possible. Poorly drained areas should be avoided because losses are often greater where water tends to stand. If overhead sprinklers are used, seedlings should be irrigated so that water on seedlings dries before nightfall. Because shading frames increase the length of time that moisture remains on foliage, they should not be used unless absolutely necessary. Junipers or other hosts of this fungus should not be used in nursery windbreaks or in landscape plantings on nursery



Figure 50-3. Pycnidia on leaves and branches.

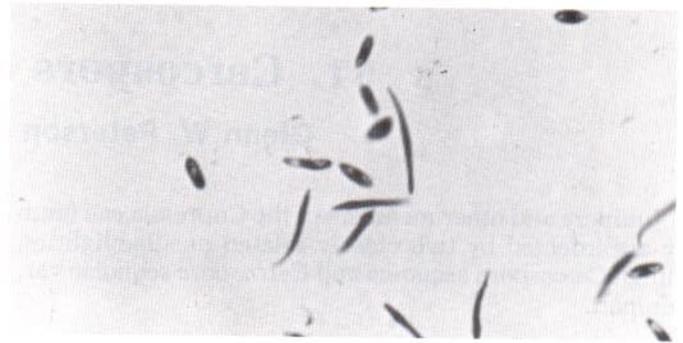


Figure 50-4. Alpha (ellipsoidal) and beta (long) spores of *P. juniperovora*.

grounds, because they may be a source of inoculum (spores) for nursery stock. Such trees are more likely to be extensively infected if pruning results in development of juvenile foliage.

Susceptibility to *P. juniperovora* varies considerably among junipers. Research is seeking to determine if there is useable genetic resistance to *P. juniperovora* among and within progenies from select eastern redcedar trees.

Selected References

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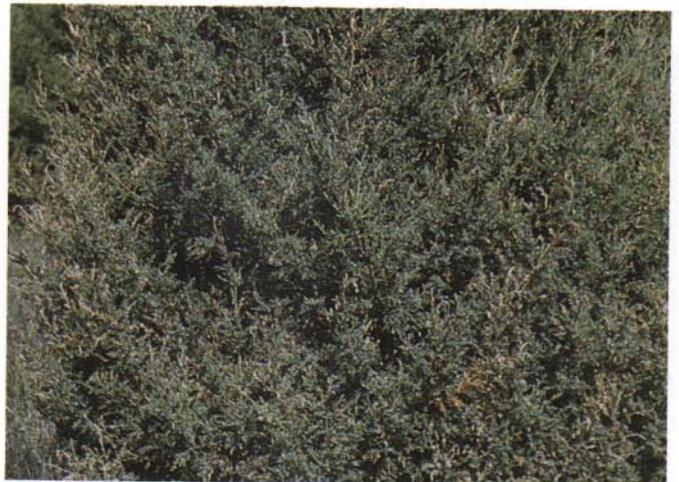


Figure 50-5. Branch tips of 7-year-old *Juniperus virginiana* damaged by *P. juniperovora*.