

51. *Cercospora* Blight of Junipers

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Junipers and other members of the Cupressaceae family are infected by two closely related needle-blighting fungi, *Cercospora sequoiae* and *Cercospora sequoiae* var. *juniperi*.

Hosts and Distribution

In the Great Plains, *C. sequoiae* var. *juniperi* has severely damaged eastern redcedar and Rocky Mountain juniper in well-established windbreaks and other plantings. The distribution of these two fungi in the central United States is shown in figure 51-1.

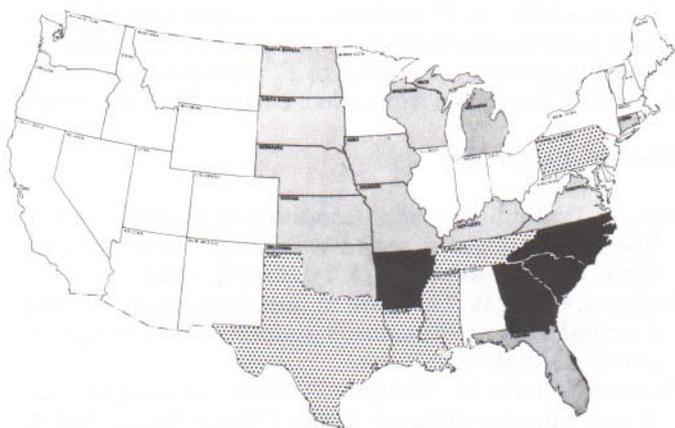


Figure 51-1. Geographic distribution of *Cercospora sequoiae* and *C. sequoiae* var. *juniperi*. *C. sequoiae* dots; *C. sequoiae* var. *juniperi* gray; both black.

Symptoms and Signs

Cercospora blight is readily distinguished from *Phomopsis* and *Kabatina* blights of junipers. The



Figure 51-2. Typical appearance of infected Rocky Mountain juniper.

branches of *Cercospora* infected trees usually will be devoid of foliage near their bases but will have healthy foliage on their tips (fig. 51-2); branches of trees infected with *Phomopsis* and *Kabatina* will have dead tips.

Juniper foliage is of three types: (1) whip leaves characteristic of long shoot growth on the ends of secondary and tertiary branches; (2) spur leaves characteristic of short (spur) branches; and (3) juvenile leaves characteristic of seedlings.

Early symptoms are bronzed tips of leaves on spur shoots. Subsequently these leaves become entirely bronzed, then necrotic. Commonly, all leaves of a branchlet are affected. Infected foliage on branchlets usually dies in late September.

Affected branchlets drop from trees in October and November, resulting in the typical appearance of *Cercospora* infected trees—the extremities of the branches bear healthy green foliage and the inner crown is devoid of foliage. Following severe infection, juvenile foliage commonly develops on branches that previously have had only spur and whip foliage.

Disease Cycle

Spores of the fungus (fig. 51-3) are dispersed from late April through October. Dispersal may not be abundant until late May or June, and no spores are dispersed during rainless periods. There is little or no long-distance wind dispersal of spores; no spores were collected in traps located 6 feet from severely infected trees. Moisture is required for spores to germinate and for the fungus to penetrate foliage. Infection has been severe when rainfall during the growing season was at or above average. Infection was slight during the drought years of 1975 and 1976 in eastern Nebraska.

Junipers in eastern Nebraska are infected first in early to midsummer. The period between initial infection and first appearance of symptoms is between 2 and 3 weeks.

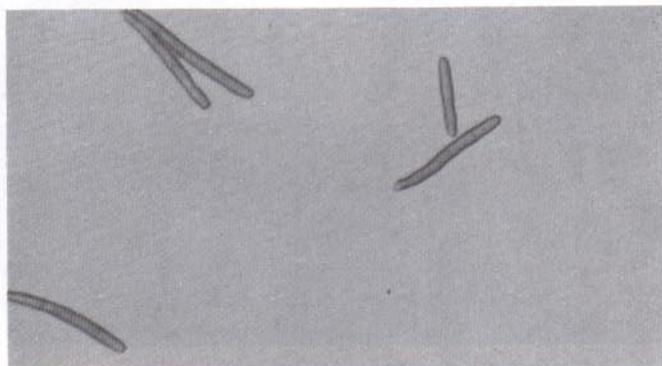


Figure 51-3. Spores of *C. sequoiae* var. *juniperi*.

The disease develops more rapidly in juvenile leaves than in spur leaves. Also, both current-year and previous-years' juvenile leaves become infected, whereas only the previous-years' spur leaves become infected.

Fruiting bodies (sporodochia) (fig. 51-4) resulting from current-season's infection were observed in both spur foliage and juvenile foliage in September. They sporulated readily when incubated at 75°F and 100 percent relative humidity for 18 hours.

Damage

The disease is found more frequently, develops more rapidly, and causes greater mortality in *J. scopulorum* than in *J. virginiana*. This fungus has not been a threat to production of juniper seedlings in the Great Plains; it is seldom found on nursery seedlings. However, *Cercospora* infection has been commonly observed in nurseries on grafted selections of junipers, particularly selections of *J. scopulorum* that have been kept in the nursery for 5 or 6 years.

Tips of secondary and tertiary branches on 10-year-old *J. virginiana* were free of infection for an average distance of 1.5 feet. The disease had extended an average distance of 11 inches along the branches the previous year. Lack of infection on tips may be a result of less moisture on the outermost foliage because of more rapid drying. Whip foliage, which develops on branch tips, also may be resistant to infection.

Trees planted in north-south rows had much more infection on the west side than on the east side. The longer persistence of moisture from dew or evening rains on the west side probably accounts for the higher levels of infection.

Control

Because whip and spur foliage are not infected before late June (and then only previous years' foliage become infected), a highly persistent fungicide applied before late June could protect trees with only spur and whip foliage for the entire season. Because of fungicide weathering, however, an additional application in late July usually is required.

Because both current-year and previous years' juvenile foliage become infected, juniper trees containing juvenile leaves would require additional fungicide applications. Bordeaux mixture (8-8-100) provided a high degree of disease suppression in control tests.

Park managers following control procedures outlined above have controlled *Cercospora* blight on *J. scopulorum* and on *J. virginiana* since 1973. The timing of fungicide applications (figure 51-5) was developed from tests in eastern Nebraska. Timing should be modified slightly in other areas—earlier applications in southern locations.

Cercospora blight is found more frequently in new plantings of *J. scopulorum* than in new plantings of *J. virginiana*. Where *Cercospora* may be a problem, it would be better to plant *J. virginiana*.

Genetic resistance to *Cercospora* is currently being evaluated.

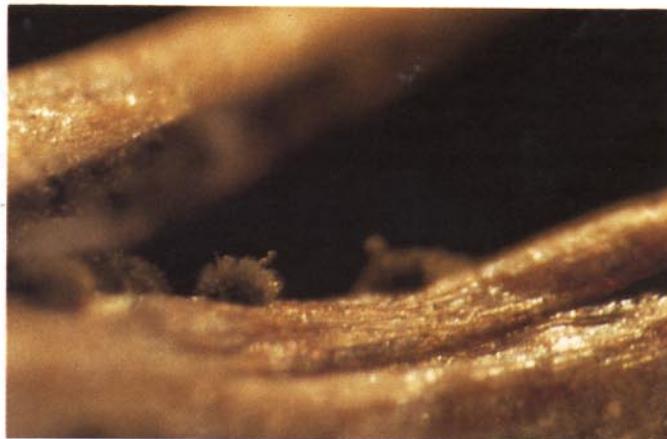
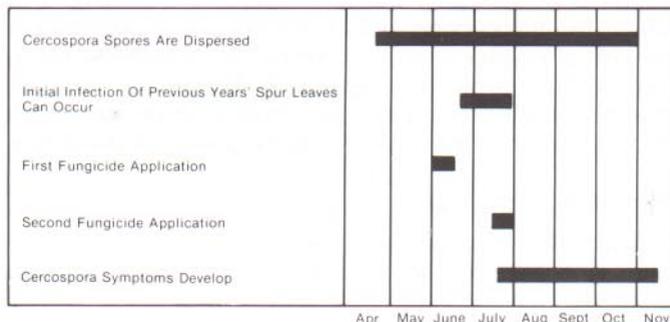


Figure 51-4. Fruiting bodies of *C. sequoiae* var. *juniperi* showing fuzzy gray appearance of conidia and conidiophores.

Figure 51-5. Schedule for developing programs for control of *Cercospora* blight.



Selected References

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