9. Leaf Spots of Nanking Cherry and Chokecherry

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Leaf spots are common diseases of Nanking cherry and chokecherry in the Great Plains. Chokecherry is often planted in windbreaks; Nanking cherry, a common ornamental, is also planted occasionally in windbreaks.

Hosts and Distribution

Nanking cherry and chokecherry leaf spots are caused by the fungus *Coccomyces hiemalis* (often referred to as *C. lutescens* on chokecherry) and the bacterium *Pseudomonas syringae* pv. *syringae*. Both pathogens produce typical "shot-hole" lesions, a common name of the disease. These diseases are common throughout the range of their hosts and are particularly important in the Great Plains and eastern United States. *C. hiemalis* also causes a serious disease of commercial cherries, particularly in the Lake States. *Pseudomonas syringae* pv. *syringae* also causes leaf spots and cankers of commercial stone fruit trees.

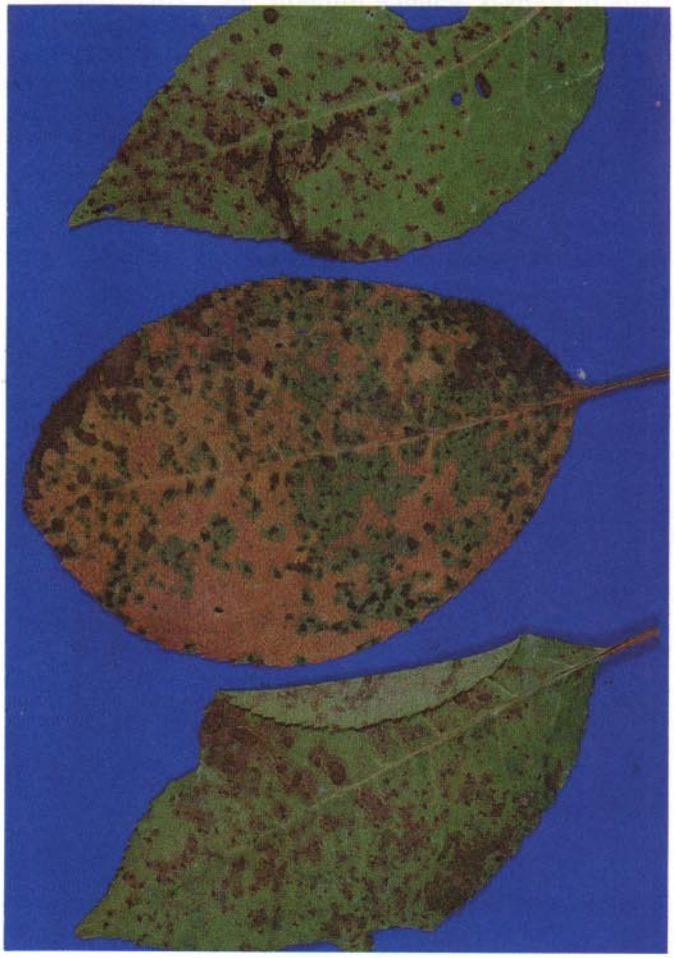

Figure 9-1. Leaf spot symptoms on chokecherry caused by *Coccomyces hiemalis*.

Symptoms and Signs

Leaf spots caused by *C. hiemalis* first appear as small, purple or reddish circular spots, which later enlarge and turn brown. Spots are usually 4–5 mm in diameter; they may be few in number or become so numerous as to coalesce and form large irregular necrotic areas (figs. 9–1, 9–2). During humid periods, whitish spore masses (conidia) are visible in the center of lesions; these masses are more numerous on the underside of leaves. Generally, necrotic tissues within lesions separate from the surrounding leaf tissues, forming characteristic shot-holes. During severe stages of disease, infected leaves become highly chlorotic, and trees may appear yellow. Premature defoliation of heavily infected trees may occur.

The leaf spots caused by *P. syringae* pv. *syringae* are similar. Lesions are reddish-brown, angular or circular, and frequently fall out, giving infected leaves a tattered appearance. Lesions may coalesce to form large areas of necrotic tissue. Heavily infected leaves are chlorotic and may be shed prematurely. *P. syringae* pv. *syringae* also may cause depressed black lesions on fruits, and cankers on twigs and branches. Gummosis commonly occurs around cankers.

Disease Cycle

Infection by *C. hiemalis* begins in the spring, and is caused by ascospores from fruiting bodies (apothecia) that form on previously infected, fallen leaves. Ascospores are wind dispersed and cause infection during April and May. Leaves are especially susceptible

shortly after budbreak. The conidial stage of the fungus (*Cylindrosporium* sp.) forms white spore masses within the center of leaf lesions. Conidia are dispersed by rain and cause secondary infections throughout the summer. Warm temperatures are especially conducive to disease development. Heavy infection may cause premature leaf fall; some trees may be completely defoliated by July. Repeated infections reduce tree vigor.

P. syringae pv. *syringae* is a common epiphyte and often occurs on the fruit, limbs, and leaves of both susceptible and nonsusceptible plants. Infection is correlated more closely with favorable weather conditions than with the availability of inoculum. Bacteria overwinter within cankers and are spread to and cause infection of leaves in the spring during cool, wet weather. Free-standing water is necessary for leaf infection. Cankers are formed when bacteria infect branches through wounds, such as those made during pruning. Repeated infections develop throughout the growing season during wet periods. Heavily infected leaves fall prematurely. Trees with repeated infections decline over several years.

Damage

C. hiemalis causes serious damage to commercial cherries in parts of the United States and Europe. Effects on Nanking cherry and chokecherry are less dramatic, although plantings of chokecherry have been reduced in parts of the Great Plains because of this disease. The pathogen commonly causes severe defoliation of chokecherry in Great Plains nurseries. *P. syringae* pv. *syringae* is most important as a canker-causing pathogen of commercial stone fruit trees. Its effect on Nanking cherry and chokecherry is limited, although some windbreak and ornamental plantings may be severely infected. Both diseases reduce vigor of trees but rarely kill them.

Control

Usually, control of these leaf spot diseases is necessary only in commercial fruit growing areas and in nurseries. *C. hiemalis* can be controlled with protectant fungicides applied directly to foliage, or with eradicant fungicides applied on previously infected leaves on the ground about the time apothecia are swelling. Best results have been obtained with several foliar applications of fungicides coordinated with periods of high infection hazard. A model has been formulated recently which predicts periods of high disease probability in commercial cherry orchards. The number of fungicide applications necessary to control the disease has been reduced by use of this model.

Leaf spot caused by *P. syringae* pv. *syringae* can be controlled by sanitation, such as dormant pruning of cankered wood and removal of leaves and other debris in the fall. Fungicides can be used to suppress disease development, but fungicides alone do not provide good control. A combination of sanitation and fungicide application is recommended.

Selected References

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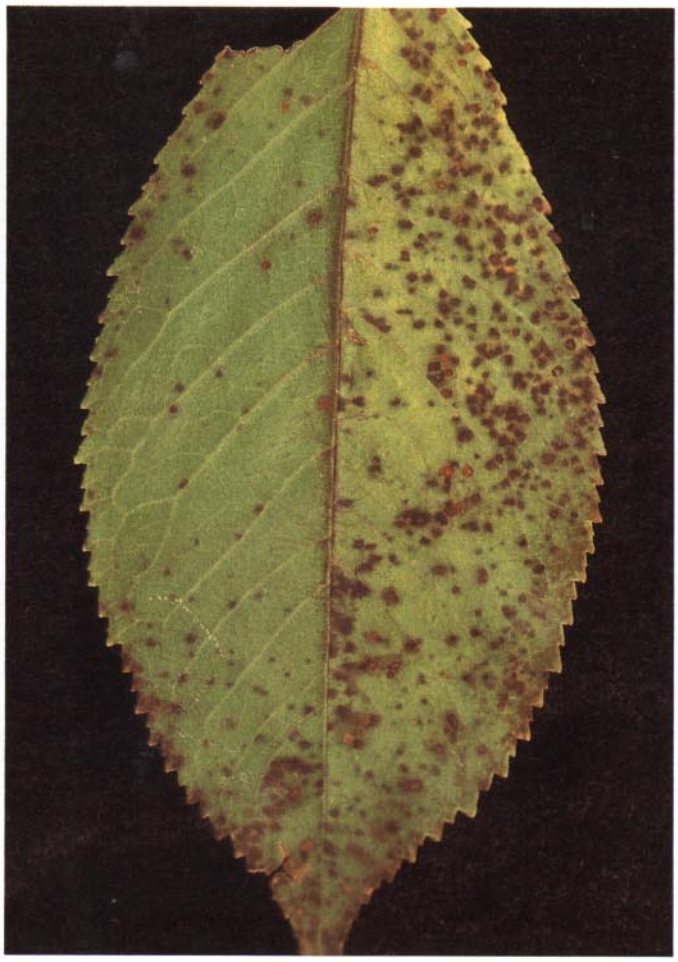

Figure 9-2. Leaf spot symptoms on sweet cherry caused by *C. hiemalis*.