

22. Septoria Canker of Cottonwood and Hybrid Poplars

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Septoria musiva causes leaf spots and cankers on native and hybrid poplars. Information on the leaf spots caused by this fungus appears in Article 3.

Hosts and Distribution

S. musiva is indigenous throughout much of the United States and Canada. In the Great Plains it occurs in North Dakota, Nebraska, and Texas. The fungus produces cankers on native cottonwood (*Populus deltoides*), and on a wide range of hybrid poplars, particularly those of cottonwood, balsam poplar (*P. balsamifera*), or black poplar (*P. nigra*) parentage. In the north-central region of the United States, hybrids with a parent of Japanese poplar (*P. maximowiczii*), black cottonwood (*P. trichocarpa*), or laurel poplar (*P. laurifolia*) are very susceptible.

Symptoms and Signs

Cankers are formed on the main stem and branches of the current season's growth, usually within 5 feet of the ground. Cankers are often flat-faced, or have swollen marginal callus. The bark of young cankers is dark brown or black and depressed (fig. 22-1). Infected cambium is killed, and small black pycnidia may develop in bark in the ashy-white central area of the cankers (fig. 22-2). Continued development of cankers may result in girdling and death of affected stems during late summer. Affected stems may be infected by other canker fungi, such as *Cytospora chrysosperma*, that cause additional damage.

Two types of spores form in fruiting structures in infected host tissues. Conidia (pycnidiospores) develop in



Figure 22-1. Canker on young plantation tree.



Figure 22-2. Depressed cankers on cottonwood cuttings. Pycnidia develop on bark in the central area of young cankers.

pycnidia on bark or leaves, and exude in pink or white tendrils during wet weather. Conidia are hyaline, cylindrical, straight or curved, one to four septate, and are 20–56 μm long by 3–4 μm wide. Ascospores of the perfect stage *Mycosphaerella populorum* are produced in perithecia that develop on fallen leaves. The ascospores are hyaline, 1-septate, and 16–28 μm long by 4.5–6.0 μm wide.

Disease Cycle

S. musiva overwinters on fallen infected leaves and in bark of cankers. In the spring, ascospores and conidia from fallen leaves and conidia from cankers are discharged during wet weather. These spores are dispersed by wind and washed by rain to infect leaves and stems. Both ascospores and conidia can cause stem infections. Infections may occur through stipules (fig. 22-3), petioles, buds, lenticels, or through bark wounds. The fungus also can infect unwounded leaves and stems. Leaf infection usually precedes stem infection. Leaf spots appear soon after leaves develop, and the fungus spreads to stems and branches to form cankers. Cankers are formed on twigs of the current season's growth, and pycnidia develop shortly after infection. Conidia from pycnidia in leaf spots and cankers cause secondary in-



Figure 22-3. Infection of cottonwood stem through leaf stipules and subsequent canker development.

fections. Disease development is enhanced by warm temperatures and long periods of humidity.

Damage

S. musiva damages poplars of all ages, but damage is most severe in nursery stool (propagation) beds and in young plantations. In plantations, growth of the fungus from twigs into main stems results in cankers that girdle small stems of susceptible trees, particularly hybrids. Extensive losses have occurred in hybrid poplar plantings in northeastern States. Multiple cankers can girdle affected stems; single cankers seldom girdle a branch or stem of moderately susceptible trees, but the cankers may be invaded by other fungi that do girdle stems and kill trees.

Control

Damage caused by *S. musiva* is reduced primarily by the use of resistant cultivars. Clones resistant or moderately susceptible to leaf spot also tend to be resistant to cankers, so these clones should be selected for planting. Vigorous, disease free planting stock should be used for establishment and maximum early growth of hybrid poplar.

Fungicides can reduce pathogen populations. Captafol effectively controlled *S. musiva* in a central Iowa planting in tests in 1979–1980. Benomyl applied at one pound active ingredient per 100 gallons of water once in spring and bimonthly throughout the growing season also has controlled *S. musiva* on susceptible clones.

Cultural treatments, such as cultivation or raking in the fall to remove leaf litter containing fungal inoculum, will minimize primary infections in the spring if inoculum from adjacent trees is not a factor. Planting moderately susceptible trees at a wide spacing to provide good air circulation within the canopy will reduce the duration of free moisture on leaves and minimize infection by *S. musiva*.

Selected References

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