

21. *Cytospora* Canker of Cottonwoods and Willows

James A. Walla and Kenneth E. Conway

Cytospora canker, caused by *Valsa sordida* (asexual stage, *Cytospora chrysosperma*), is a common disease of poplars and willows in the Great Plains. *Cytospora* spp. can be saprophytes; they commonly colonize bark and twigs that have been killed by other causes.

Hosts and Distribution

Cytospora canker is widespread in North America. It occurs on most species of *Populus* and *Salix* throughout their range, and on many other hosts. Resistance to *Cytospora* varies among hosts.

Symptoms and Signs

Cytospora causes branch dieback and cankers on trees of any age. Cankers on trunks and limbs are often elongate, slightly sunken, discolored areas in the bark (fig. 21-1). Bark often splits along the canker margin because of callus formation by the host. The fungus may quickly girdle and kill twigs without forming cankers. Symptoms vary with mode of entry, host species affected, and stage of disease development. Infected bark may be yellow, brown, reddish-brown, gray, or black.



Diseased inner bark and cambium turns reddish-brown to black, and becomes watery and odorous as it deteriorates. Wood below the cankered bark is stained brown.

Fruiting bodies develop in dead bark. Asexual fruiting bodies (pycnidia) form first and appear as small pustules on smooth bark (figs. 21-1, 21-2). Pycnidia are less conspicuous on rough bark. Superficial cuts in cankered bark will expose small (0.5–1.5 mm dia.) black pycnidia. During moist weather, yellow to reddish-brown spore masses or tendrils may exude from pycnidia (fig. 21-3). The spores (conidia) are hyaline, allantoid, one-celled, and 3–5 by 1–1.5 μm .

Sexual fruiting bodies (perithecia) are sometimes found in bark after pycnidia mature. Perithecia are smaller (0.3–0.5 mm dia.) than pycnidia and are grouped (6–12) in a black stroma (2–8 mm dia.). The upper surface of the stroma breaks through the bark to expose a dark gray disk (fig. 21-4). Ascospores from perithecia are hyaline, allantoid, one-celled, and 7–12 by 1.5–2.5 μm .

Disease Cycle

Spores from fruiting bodies are dispersed by rain-splash, wind, insects, or birds. *Cytospora* infects only

Figure 21-1. *Cytospora* canker on stem of poplar, showing pycnidia and discolored bark.

Figure 21-2. Pycnidia of *Cytospora* on a rapidly killed stem of cottonwood without the formation of a definite canker.



through wounds or other openings in the bark. It is considered a weak parasite, and most often attacks stressed trees, such as those growing on poor sites or injured by drought, frost, sunscald, severe pruning, fire, insect or mechanical damage, or herbicides.

The fungus grows in the bark until limited by internal processes of the tree. Fruiting bodies form in infected bark to complete the life cycle. The fungus overwinters as fruiting bodies and mycelium in cankered bark.

Cytospora has been found in apparently healthy bark; thus it may be able to infect bark tissue and remain there without causing visible damage until the tree is stressed.

Damage

Cytospora can cause dieback or death of planted or native trees. It is a limiting factor in the establishment and growth of some poplars and willows. In nurseries, it can attack cuttings of poplars and willows that are used for propagation. A disease called blackstem is caused by *Cytospora* and other canker fungi; it can develop during storage or after outplanting (fig. 21-5) and can result in severely reduced nursery production.

Control

Healthy trees are less susceptible to infection and damage. If possible, water and fertilize trees as needed to maintain optimum vigor. Reduce chances of infection by preventing wounds. Do not bring infected plant materials into the area. Plant resistant varieties.

Trees that usually are not resistant to *C. chrysosperma* include various species (eastern cottonwood, white cottonwood, weeping willow), varieties (Lombardy and Bolleana poplar), and the selection Siouxsland cottonwood. Those usually resistant include the hybrid poplar Noreaster, certain eastern cottonwood selections (Platte, Mighty Mo, Ohio Red), and the species valley cottonwood, and black and peachleaf willow. Norway poplar is relatively resistant to blackstem.

Severely cankered branches or trees should be removed and destroyed. Prune back to a live branch beyond the canker. Small cankers on stems can be removed by excising all affected bark. Shape wounds into an ellipse to promote rapid healing. Prune during dry weather. Disinfect pruning tools with alcohol after each cut.

A systemic fungicide is labeled for *Cytospora* canker control. Protective fungicides are registered for control of wound fungi on trees but are not specifically labeled for *Cytospora*.

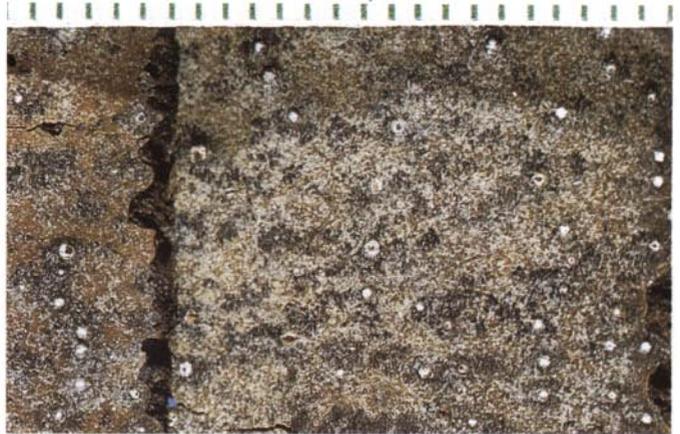
To avoid cankers on nursery cuttings, maintain healthy stock blocks. Collect shoots from stock blocks in the fall before very cold weather causes bark moisture to fall. Process and store cuttings quickly: dip cuttings in a fungicide solution before winter storage, store at a constant temperature below 35°F, and plant cuttings in beds after soil warms to allow rapid plant growth.

Figure 21-5. Poplar cuttings with necrotic tissue typical of blackstem caused by *Cytospora*.



Figure 21-3. Spore tendril from pycnidium of *Cytospora*.

Figure 21-4. Perithecia with gray disk typical of *Valsa* spp. (scale in mm).



Selected References

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