

Colorado blue spruce and other conifers disorder: *Cytospora* canker

M. F. HEIMANN and G. R. STANOSZ

In Wisconsin *Cytospora* canker damages varieties of Colorado blue spruce more frequently and severely than any other species. However, it also affects Norway spruce and, less commonly, other spruces and Douglas fir. A Colorado blue spruce growing at higher elevations within its natural range is rarely infected. Trees planted as ornamentals in Wisconsin and elsewhere become more susceptible when grown under environmental stresses, such as drought.

Symptoms and effects

Symptoms of *Cytospora* canker usually do not appear until trees are about 15 years old and at least 20 feet high. Ordinarily, damage appears first on lower branches of the tree, but occasionally it appears on a single branch higher in the tree. Needles on affected branches turn purplish, then become brown as they die. The needles eventually fall off, leaving bare branches and twigs. Over many years, branch infection and death progress from the bottom of the tree toward the top. The whole tree does not usually die, but its aesthetic value declines.

Cytospora cankers kill branches by destroying water-conducting tissues during their development. These cankers appear discolored, sunken or swollen, with dead bark, but they are not always easy to discern. Dried, bluish-white resin that has oozed from the bark is a good

indicator. It may also have dripped onto other branches or needles. Cutting into the inner bark and cambium of the canker will expose tissue that is brown and dead, in contrast to its normal green color. The wood under the cambium or cankered area usually is not discolored.



Cytospora canker has defoliated branches of this spruce tree, starting at the bottom and moving up.



Bark has been cut from this branch to show the dead tissue beneath a *Cytospora* canker. Notice the oozing, bluish-white resin visible above the cut.

Cause

The fungus *Leucocytospora kunzei* causes Cytospora canker. Sometimes you can see fruiting bodies of the fungus near the margins of cankers, but they may not be obvious. These very small, black structures develop in the bark, and, in turn, produce the spores that disperse the fungus. Spores are released throughout the growing season and are spread by wind, splashing rain, insects, and mammals. Germination of the spores initiates infection of other branches on the same tree and branches of other trees.

Control

The best way to control Cytospora canker is to prevent it. Consider planting conifer species that are not susceptible instead of Colorado blue spruce. If you have decided on Colorado blue spruce, it is best to plant the tree in an area with good air circulation. It would not be a good species to plant in a dense windbreak.

Because stress appears to enhance the development of this disease, measures to improve tree vigor should help prevent Cytospora canker. Irrigation during periods of drought is especially important. Practices that encourage healthy root development will also reduce stress. These include providing adequate root zones, avoiding soil compaction and eliminating poor drainage. Fertilization every 3–5 years to encourage root growth may help prevent canker development, too, but you should avoid applying excessive nitrogen.

If symptoms of Cytospora canker appear, immediately remove infected branches by pruning at the point of attachment to the tree trunk. Removing dead branches will improve the tree's appearance and will also remove the source of spores, reducing reinfection of the same tree as well as infection of other trees. Pruning should be done only in dry weather, and you should dip tools in alcohol after each cut. All removed branches should be destroyed. No chemical fungicides are available for control of this disease.



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