



Quick Facts...

Cytospora canker is caused by several species of fungi in the Genus *Cytospora*.

The disease occurs on woody shrubs and trees or parts of plants that are slightly stressed.

Many trees are affected by this disease (apple, ash, aspen, birch, cottonwood, elm, maple, peach, spruce and willow).

The canker-causing fungi cause girdling of the plant, killing the plant above the canker.

To manage the disease, reduce stress on trees, use resistant plants, remove infected limbs, clean wounds and prune properly.

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DISEASES

Cytospora Canker

no. 2.937

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Cytospora canker is caused by various species of the fungus *Cytospora*. These pathogens affect many species of shrubs and trees in Colorado, including aspen, cottonwood, lombardy and other poplars, apple, cherry, peach, plum, birch, willow, honeylocust, mountain ash, silver maple, spruce and Siberian elm. Some *Cytospora* species are host specific and will not spread to other tree species while other species can infect several different tree species. For example, cottonwoods and aspen are susceptible to one specie. Willow, green ash, alder and elm, however, are attacked by *Cytospora* species that are host specific. Further work is needed to clarify the various host and fungal relationships.

The fungus attacks trees or parts of trees that are injured or in a weak or stressed condition. The fungus grows in the living bark (phloem) and wood (xylem) and kills by girdling the branch or tree. The fungus can attack tree bark during the fall-winter spring seasons when temperatures are warm but the tree is dormant and cannot defend itself. Trees affected by drought, late spring frosts, insect and fungi defoliation, sunscald, herbicides, or mechanical injury are susceptible to *Cytospora* infection. The disease especially affects trees with root damage, which are often found in areas under construction, or trees that recently have been transplanted. Stands of aspen that have been thinned and young aspen sprout stands may suffer from *Cytospora* canker.

Symptoms

The symptoms of this disease are yellow or orange-brown to black discolored areas on the bark of the trunk and branches (Figure 1). Liquid ooze on aspen and gummy ooze on peach and cherry are common. Cankers, sunken dead areas of bark with black pinhead-sized speckling or pimples, may be evident (Figure 2). The pimples are the reproductive structures of the fungus. Under moist conditions, masses of spores (seeds) may ooze out of the pimples in long, orange, coiled, thread-like spore tendrils (Figure 3). Reddish-brown discoloration of the wood and inner bark also may be evident. Dead bark may remain attached to the tree for several years, then fall off in large pieces.

On spruce trees, the disease appears as sunken, resinous areas surrounded by swollen callus giving a gall-like appearance. Small, black fruiting bodies may occur on the canker. Once the branch is girdled, needles may yellow or redden and the branch eventually dies. Large amounts of resin flow from infected areas, coating branches and stems. Unless you see sunken areas surrounded by swollen callus, resin flow on spruce may indicate that other stresses, diseases or insects are affecting the tree.

Control

Because this canker disease usually occurs on a weakened host, the first and foremost method of control is to prevent stress on the tree. Drought and



Figure 1: Orange discoloration found in spring and early summer associated with cytospora canker.

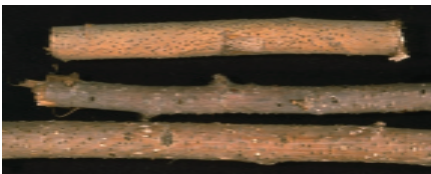


Figure 2: Cytospora canker on three branches, each with scattered pycnidia.

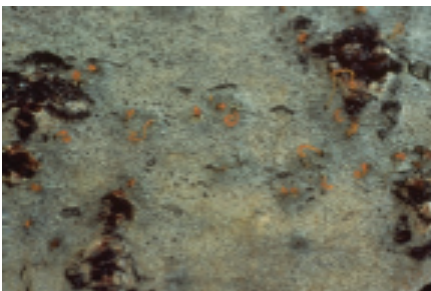


Figure 3: Orange spores oozing from pycnidia.

Further Information:

Guyon, J.C. and Jacobi, W.R. 1996. *Effects of environmental stress on development of Cytospora canker of aspen. Plant Dis. 80:1320-1326.*

Kepley, J. B., and Jacobi, W.R. 2000. *Pathogenicity of Cytospora fungi and six hardwood species. J. Arboriculture. 26: 326-3332.*

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oxygen starvation of roots by flooding soil with water are the two most common stresses that predispose trees to *Cytospora* infection.

To help a tree resist infection, prepare soil before planting, fertilize, water properly for winter and summer, prune, and avoid injury to the trunk and limbs. Proper care of recently transplanted trees also is essential to avoid stress and infection. See fact sheets 2.932, *Environmental Disorders of Woody Plants*, 7.211, *Fall and winter watering*, and 7.226, *Care of young, transplanted trees*.

Wounds caused by lawnmowers and weed trimmers are prime targets for infection on trees in landscaped areas. Insects, such as oystershell scale, stress the tree and predispose it to cytospora infection. Insects should be controlled to prevent mortality by the combined stress of the insects and *Cytospora* canker.

Help prevent cankers at pruning wounds on peach and cherry trees by applying labeled fungicides as wound dressings. Do not rely on the effectiveness of fungicides on wounds of other trees to prevent infection.

Another way to prevent *Cytospora* damage is to use resistant species or varieties in new plantings (Table 1). It is still important to keep all trees healthy since resistant trees may still become infected if severely stressed. Purchasing healthy nursery stock will decrease the possibility of infection. Once infection occurs, the best treatment is to increase plant vigor and sanitation. Remove all infected limbs and other areas. When removing branches, make a smooth cut at the base of the limb, as near the trunk as possible, without damaging the branch collar (swollen area at base of branch). Jagged and rough cut surfaces promote infection.

Clean wounds to avoid further spread of infection. Remove dead bark to dry out the diseased area and help the tree defend itself against insect and fungal attacks on the cankered area. Directions for proper wound and canker treatment are as follows:

- Prune or cut trees only during dry weather.
- Clean tools and wipe them with ethyl alcohol, Lysol or other disinfectant. Clorox may be used at a concentration of one part Clorox to nine parts water.
- If a wound is fresh (one month old or less), use a sharp knife to carefully cut and remove all injured or diseased bark back to live, healthy tissue. If the wound is older, just remove loose bark pieces. It is important not to cut, remove or damage callus that may be forming at the canker edge. Callus will look like swollen bark growing across the dead area. Scrape the wound surface clean of loose bark.
- Clean tools and disinfect after each cut.
- Cleaned wounds should not have any sharp angles.
- Do not apply any tar, oil-based paint or other wound dressing. The best method to prevent infection or decay is to dry out the cleaned tissue.

Table 1: Some resistant species and cultivars.

Ash	Most cultivars.
Aspen	Resistant cultivars not commercially available.
Cottonwood	Cultivars: Noreaster, Platte, Mighty Mo, Ohio Red. Avoid Lombardy, Bolleana, Sioux Land.
Elms	Most cultivars.
Hackberry	Most cultivars.
Honeylocust	Most cultivars.
Junipers	Most cultivars.
Lindens	Big and little leaf.
Maples	Most species and cultivars.
Pines	Most species and cultivars.

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