

# CYTOSPORA CANCKER

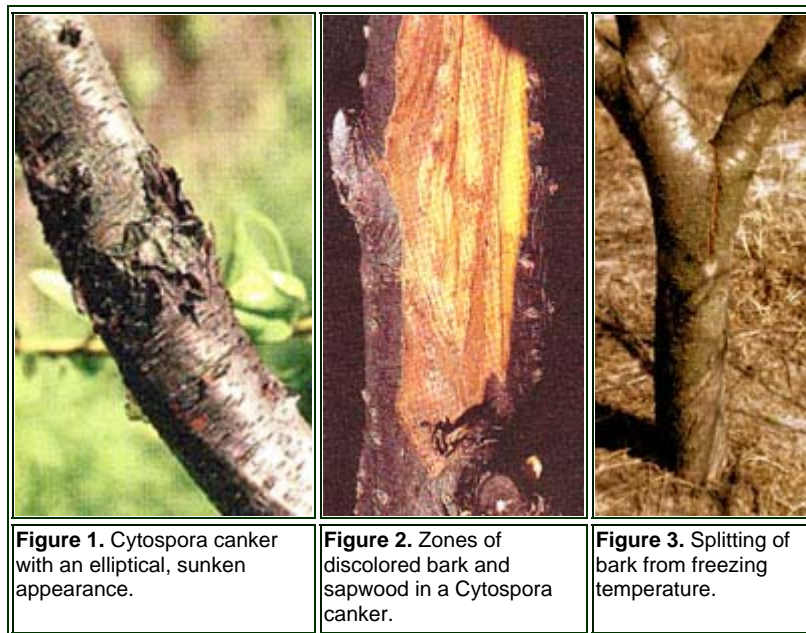
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Cytospora canker, also known as perennial canker, peach canker, Valsa canker, and Leucostoma canker, is caused by *Leucocytospora cincta* (Sacc.) Hohn. (syn. *Cytospora cincta* Sacc.) and *Leucocytospora leucostoma*, Sacc. (syn. *Cytospora leucostoma* Sacc.). These fungi are also known by their less common sexual reproductive stages as *Leucostoma cincta* (Fr.:Fr.) Hohn. (syn. *Valsa cincta* Fr.:Fr.) and *Leucostoma persoonii* Hohn. (syn. *Valsa leucostoma* (Pers.:Fr.)).

## SYMPTOMS AND DISEASE DEVELOPMENT

Cytospora fungi are very opportunistic on peach; infections often develop in association with wounding from sunscald, pruning, cold injury, lesser peachtree borer, or bacterial canker. Cytospora fungi infect multiple sites, resulting in several different symptoms. Cankers can develop on individual branches and scaffold limbs. "Perennial" cankers may persist for several years before killing the branch. These cankers extend along the branch, producing a sunken elliptical lesion (Figure 1). Perennial cankers are commonly observed surrounding pruning wounds. Cutting into the bark at the edge of the sunken area reveals a zonate or banded canker area and discolored sapwood (Figure 2). Cytospora fungi also readily infect the crotch and trunk, spreading rapidly through the bark and sapwood; often this follows injury from freezing temperatures that occur when trees experience severe temperature changes before they are adequately dormant (Figure 3). Cytospora fungi rapidly colonize cold-damaged tissue in late winter and early spring; infected trees usually die by the following summer. From late winter to early spring, Cytospora fungi produce an abundance of pimple-like spore-producing structures termed "pycnidia" (Figure 4). Removal of the outer part of the bark may reveal developing pycnidia (Figure 5). As the pycnidia develop, they push through the bark, giving the branch the appearance of being pebbled with small, raised dots. During rainy weather, spores ooze from the pycnidia and are dispersed to new infection sites by splashing and wind-blown rain. If the rain period is short in duration and followed by humid, but not wet conditions, amber-colored cirrhi, or spore tendrils, ooze from the pycnidia and dry, leaving a fine thread. These tendrils consist of spore masses embedded in a very soluble matrix. When numerous spore tendrils form, branches may appear to be covered with hair (Figure 6). Upon rewetting, the tendrils quickly dissolve and the spores are carried away.





**Figure 7.** Nodal infection with developing canker and amber gum.

**Figure 4.** Scaffold branch with fungal fruiting bodies (pycnidia) just beneath the bark surface.

**Figure 5.** Outer bark removed to expose the pycnidia.

**Figure 6.** Hairy appearance of *Cytospora* spore tendrils.

*Cytospora* fungi also infect fruit and leaf buds (Figure 7). These nodal infections are observed three to four weeks after budbreak. Symptoms are first seen with the failure of the infected buds to open, followed by formation of elongated cankers that extend from the node, often with an amber-colored gum developing.

The basic symptoms seen with each type of *Cytospora* canker are the same. The site and severity of infection encountered is regulated by tree health and environmental factors. *Cytospora* canker is not responsible for all sudden tree collapse, but it can be a factor in the peach tree short life complex when tissue damaged from bacterial canker (caused by *Pseudomonas syringae* pv. *syringae*) or freezing temperatures is invaded and colonized.

### Tree Susceptibility

*Cytospora* canker is generally a disease of injured, stressed, or unhealthy trees. *Cytospora* cankers seldom do significant damage to healthy, vigorous trees, even though infections occur. A healthy tree is usually able to heal

around the cankered area when growth begins in the spring after infection. If an orchard is heavily damaged by Cytospora canker, it is a sign that trees are weakened. Factors known to predispose fruit trees to damage from Cytospora canker are drought, freeze injury, and poor soils. Nematode infestations may also play a role in some orchards. Although there are differences among peach varieties in susceptibility to Cytospora canker, no truly meaningful resistance has been identified.

### Seasonal Activity

The rate of Cytospora canker expansion depends upon temperature and the peach tree's vigor. Even in weak trees susceptible to extensive damage from Cytospora canker, host growth probably has some effect on reducing canker extension. The two species of *Cytospora* show peak activity, as measured by canker expansion, at different times of the year. *C. cincta* is most active in the spring and fall when optimal canker expansion occurs between 60° and 75°F. *C. leucostoma* shows its peak activity during summer, with an optimal temperature range of 86° to 91°F. In the southeastern United States, both species are active to some extent in nearly all months of the year.

### Infection Sites

Both *C. leucostoma* and *C. cincta* require a wound or natural opening to infect a peach tree. Sites that have been reported as openings for Cytospora invasion include sunburns, cold injuries, pruning cuts, leaf scars, insect injuries (especially lesser peachtree borer), bacterial cankers, and broken limbs. Sunburn can occur when heavy pruning opens up the trees excessively, when premature defoliation occurs due to drought or mites, or when a heavy crop bends down the branches. Cold injuries can injure and weaken trees, providing an entry point for infection. Cold injury is often associated with excessively low winter temperatures, or from periods of warm weather followed by a sudden drop to 20°F or less in late winter or early spring. Pruning cuts are important points of infection in southeastern peach orchards. Trees pruned in fall or early winter are especially susceptible to Cytospora infection. Cuts made during this time heal slowly.

## CONTROL

Cytospora canker is very difficult to control in weakened or injured trees. Cytospora fungi release spores throughout the year when rain occurs. Fungal growth takes place over a wide range of temperatures during most of the year. Fungicide programs have never been successful in mitigating infection.

Removal of infected branches several inches below any infected tissue can help, but is practical if only a few cankers are present. However, if the disease is common throughout an orchard, it is a sign that the orchard is stressed and in poor condition. The only effective control of Cytospora canker is to keep the trees in a state of good vigor. Good cultural practices, described more fully elsewhere in this text, are: (1) never prune trees in the fall or early winter; (2) avoid establishing new orchards in poor soils; (3) take cultural steps to minimize freeze injury; and (4) remove dying trees and weak, non-productive branches. Ideally, this should be done before the fungus begins to sporulate on this material.

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