Cytospora canker is a destructive disease of tree fruits in Washington. Although most common on stone fruits, the disease can be encountered on apple. Also known as peach canker, perennial canker, and Valsa canker in some areas, the disease occurs wherever stone fruits are grown. The disease is general in occurrence in peach, nectarine, prune, plum, and sweet cherry orchards in Washington, and limits President plum production in Idaho. Cytospora canker is associated with winter-injured or mechanically wounded twigs, trunks, and scaffold branches.

Cytospora canker is caused by either of two fungi species, *Cytospora leucostoma* or *Cytospora cinetia*. These two fungi are very similar morphologically and can be definitively separated only by microscopic examination of the sexual fruiting structures. These structures, called perithecia, are not frequently found.

**Disease Cycle**

The Cytospora fungi are vigorous wound invaders that grow throughout the bark and cambium and to a lesser extent into the structural wood of the tree. Common infection sites are bark that has been killed or injured by low winter temperatures or sunburn, pruning cuts, or insect damage. Winter injury is frequently an important predisposing factor to infection. Once established in dead or weakened tissue, the Cytospora fungi will invade adjacent healthy tissue, causing dieback (Fig. 1) and stem cankers.

As cankers enlarge, the fungus produces pinhead-sized, black, pimplelike, spore-producing structures, called pycnidia. These structures
produce millions of spores, called conidia. During wet weather, spores ooze out of the spore-producing structures in reddish to orange colored gelatinous masses (Fig. 2). Spores are carried to other infection sites (that is, wounds on the same or nearby trees) by splashing and windblown rain, insects, or people. These spores are not adapted to wind dispersal. Spores germinate at wound sites, resulting in infection and eventual cankering. Spore-producing structures ultimately form in the new cankers, producing more spores for subsequent infections. The spore-producing structures generally form 4 to 6 weeks after a cankered branch dies. The fungus overwinters in diseased tissue of living hosts and in stem debris on the ground.

If cankers are allowed to remain for several years, a second spore-producing structure, the perithecium, develops in the diseased tissue and produces ascospores. Ascospores are wind-disseminated; infection can result if moisture is present when ascospores are blown against wounded host tissue.

Infection can occur anytime during the year, except during very hot and dry, or cold weather. In Idaho, most infections occur during spring and early summer when temperatures are mild and moisture from rainfall is high.

**Disease Symptoms**

Usually, the first symptoms of infection are dead twigs and dieback. Leaves above stem infections droop and discolor through shades of green to various shades of brown, and often remain attached, sometimes through the winter. These
"flags" (Fig. 1) are caused by stem invasions and girdling or near-girdling cankers immediately below the flag.

Cankers are dark and depressed areas of dead bark and wood on main leaders and branches. Canker margins are sharp and distinct (Fig. 3) on the bark and discolored wood. Cankers are frequently perennial and may assume a zoneate appearance. Young cankers usually exude gum at the margin and may have a sour, sap odor. The surface of the cankers may develop raised pinhead-sized pycnidia in the bark. The spore-forming structures are rarely produced on cherry stems. After rainy weather, tendrils of dried reddish-orange ooze are sometimes visible coming from pycnidia (Fig. 4).

Small at first, cankers slowly enlarge elliptically; sometimes they streak rapidly up and down the stem without girdling it immediately.

Fig. 3. Canker margin on a peach tree.

Fig. 4. Pycnidia and tendrils of dried spores on infected cherry tree.

### Disease Management

There is currently no cure for infected trees. Prevention and sanitation practices are the best management approaches. Use the following three steps concurrently.

1. **Minimize injuries.** Winter injuries are the most common infection sites. Painting tree trunks white before winter has reduced Cytospora infections. Take other measures to reduce winter injury and maintain good tree vigor.
2. **Remove and destroy infected wood.** Prune out infected branches, flags, cankers, and maintain good orchard sanitation. Cytospora has been isolated from apparently healthy tissue on cankered branches. Make pruning cuts at least one foot below the infected area.

3. **Prune correctly.** Make cuts that leave a raised collar of tissue at the branch junction rather than flush cuts or cuts that leave a stub. Pruning in the spring when wounds heal most rapidly has effectively reduced disease incidence in some areas.

Do not establish new orchards close to badly diseased orchards. Treetop or other hedgerow pruning and overhead irrigation favor the disease. Maintain trees in good vigor, but with maximum hardiness. Trees under water stress or grown in potassium-deficient soil are susceptible to infection. Weakened trees easily become victims of the Cytospora fungi.

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