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Fire Blight in Ornamentals

Fire blight is a disease caused by the bacterium *Erwinia amylovora*.

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Fire blighted flowers. Photo: Gary Moorman

This bacterium can attack more than 75 species of trees and shrubs in the rose family of plants including apple, pear, quince, mountain ash, crabapple, hawthorn, cotoneaster, serviceberry, and pyracantha. The bacterium over winters on infected plants in darkened, slightly sunken cankers. In the spring, the bacteria are dispersed by insects, rain, wind, and animals. The bacteria build up on the plant hairs, stigmas,

and other flower parts. Note that the bacteria do not survive free in the soil.

The symptoms of fire blight include the rapid killing of branch tips and leaders, especially during flowering. If the branch is examined carefully, you will find the dead flowers where the bacteria first entered. The affected twigs and branches may bend over into the shape of shepherd's crook and the blackened flower parts remain attached to the tree. If conditions are wet, a cream-colored liquid may ooze out of the cankers and run down the trunk and branches in the spring. In some trees, the bacteria kill a portion of the branch and then stop development and do not seem to kill more of the branch.





Fireblighted twigs. Photo: Gary Moorman

The bacterium is carried from infected tissue or from liquid oozing from the infected tissue to natural openings or wounds in by flower-visiting insects, rain, wind, birds, and various crawling insects. The nectaries and other flower parts, hydathodes and stomates on leaves, and small wounds on succulent twigs and branches all can be sites of initial infection. Hail damage and pruning cuts also opens tissue to infection. Succulent plant parts are blackened and killed. The bacteria then move farther into and girdle branches and the trunk. A slightly sunken, darkened canker forms in the invaded wood. Close examination will sometimes reveal a dark line at the edge of the canker. While plants are most susceptible during flowering and new shoot development, fire blight can continue to spread later in the season. If fertilization practices include applying fertilizers that are high in nitrogen, very succulent growth may result and render plants more susceptible to fire blight. The bacteria are greatly favored by moderately high temperatures ($70^{\circ}\text{-}81^{\circ}\text{F} = 21^{\circ}\text{-}27^{\circ}\text{C}$), high relative humidity, and rainfall during flowering. Such conditions are optimum for fire blight development.

Managing fire blight is extremely difficult because there are no chemicals that are very effective and registered for use on ornamentals. While fruit growers can use streptomycin, it is not registered for use on ornamentals. Copper, copper + mancozeb, phosphite salts, fosetyl-Al, or potassium salts of phosphorus acid provide some protection of the flowers. Some populations of *Erwinia amylovora* are resistant to copper. These chemicals do nothing for the cankers that are already established in an infected plant.



In this photo, note discolored area of canker just under the bark. Photo: Gary Moorman

Cankered twigs and branches must be pruned. During the dormant season, closely examine susceptible plants and prune out infected tissues. Look for blackened twigs, branches, and dead flower parts. Find the sunken, darkened cankers on the wood. Prune when the weather is dry, cutting at least 4 to 6 inches below the canker.

When pruning specifically for fire blight control, work with several pruning shears. Disinfect the tool used to make the first couple of cuts by soaking it in 70% alcohol, 10% bleach, or hydrogen dioxide for a few minutes. While that is soaking, use a clean tool for the next couple of cuts. It is highly recommended that such pruning be done during dormancy. Pruning during the growing season has been shown to result in the spread of disease, even with careful cleaning of pruning tools.

(See Blachinsky, D., Shtienberg, D., Oppenheim, D., Zilberstaine, M., Levi, S., Zamski, E., and Shoseyov, O. 2003. *The role of autumn infections in the progression of fire blight symptoms in perennial pear branches*. Plant Disease 8:1077-1082).

The very best way of dealing with fire blight is to not deal with fire blight--grow resistant varieties. Some crabapple cultivars with resistance include Adams, Callaway, David, Dolgo, Harvest Gold, Indian Summer, Jewelberry, Liset, Profusion, Red Baron, Selkirk, and Sentinel. *Pyracantha* cultivars considered resistant include Mojave, Navaho, Teton, and Shawnee. *Cotoneaster anoenus*, *C. adpressus*, *C. canadensis*, *C. dammeri* var. *radicans*, *C. horizontalis*, *C. microphyllus*, *C. praecox*, and *C. zabelii* are resistant. *Crataegus arnoldiana*, *C. coccinea*, *C. crus-galli*, *C. douglasii*, *C. phaenopyrum*, *C. prunifolia*, *C. punctata* 'Ohio Pioneer', *C. viridis* 'Winer King' are considered resistant as are *Sorbus aucuparia* and *S. intermedia*.

For detailed information on all aspects of fire blight, see: van der Zwet, T., Orolaza-Halbrendt, N. and Zeller, W. 2012. [Fire Blight: History, biology, and management](#). St. Paul, MN, APS Press