



Fire Blight of Apples, Crabapples and Pears

Fire blight is a common and very destructive bacterial disease of apples and pears. The disease is so named because infected leaves on very susceptible trees will suddenly turn brown, appearing as though they had been scorched by fire. As a result of this disease, blight susceptible pear cultivars are no longer grown in many parts in the Midwest. Damage and losses from fire blight on apple result from: death or severe damage to trees in the nursery; death of young trees in the orchard; delay of bearing in young trees due to frequent blighting of shoots and limbs; loss of limbs or entire trees in older plantings as the result of girdling by fire blight cankers; and direct loss of fruit due to blighting of blossoms and young fruit. Fire blight may cause severe damage to many other members of the Rosaceae family. Quince, crabapple, mountain ash, spirea, hawthorn, pyracantha, and cotoneaster are all susceptible. Cultivars within some of these species are resistant.

Symptoms

Blossom and twig blight symptoms appear in the spring. Diseased blossoms become water-soaked and turn brown. The bacteria may then grow down into the blossom bearing twigs (spurs). Leaves on the spur become blighted, turning brown on apple and black on pear. Droplets of milky tan-colored bacterial ooze may be visible on the surface of diseased tissue. These droplets contain millions of bacteria which can cause new infections.

Twig blight starts at the growing tips of shoots and moves down into older portions of the twig. Blighted twigs first appear water-soaked, and then turn dark brown or black. Blighted leaves remain attached to the dead branches through the summer. The end of the branch may bend over, resembling a shepherd's crook or an upside down "J". As the fire blight bacteria move through blighted twigs into main branches, the bark sometimes cracks along the margin of the infected area on the main branch causing a distinct canker.

Both apple and pear fruit may be blighted. Rotted areas turn brown to black and become covered with droplets of ooze. The fruit remains firm but later dries out and shrivels into mummies.

Causal Organism

Fire blight is caused by the bacterium, *Erwinia amylovora*. The fire blight bacteria over winter in living tissue at the margins of cankers on the trunk and main branches. The bacteria become active in the spring when temperatures get above 65 degrees F. Their growth is favored by rain, heavy dews, and high humidity. By the time trees are blossoming, droplets of ooze containing the bacteria are present on the surface of cankers. Relatively few over wintering cankers become active and produce bacteria in the spring, but a single active canker may produce millions of bacteria, enough to infect an entire orchard. The bacteria in droplets of ooze are spread by splashing rain or insects (mostly bees, flies, and ants) to open blossoms. The bacteria multiply rapidly in the blossom nectar, and invade the blossom tissue through natural openings called nectaries. The optimum temperature range for blossom blight infection is 65 to 86 degrees F. The bacteria are spread from blossom to blossom by rain or pollinating insects.

Actively growing shoot tips are infected by bacteria that have been spread by rain or insects from both cankers and infected blossoms. Invasion can occur directly

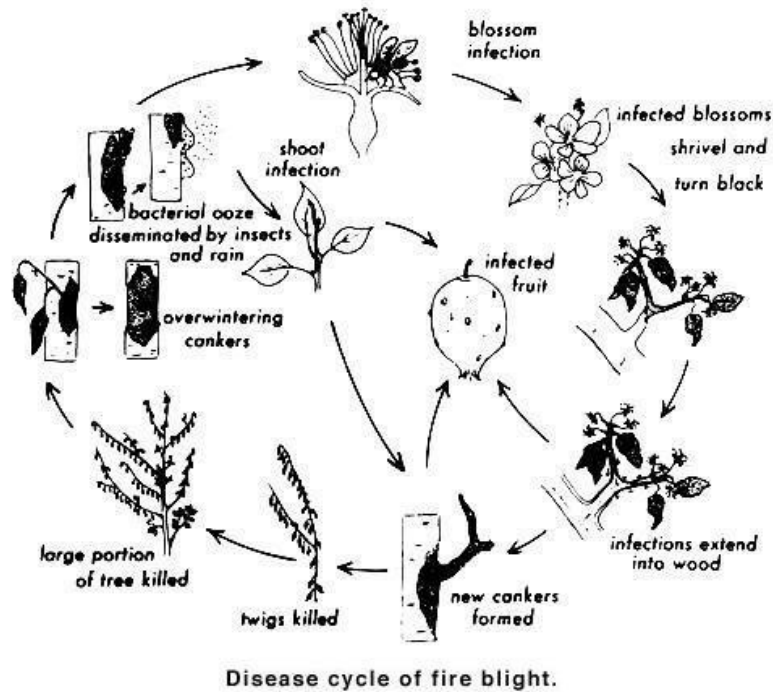


Fire blight on apple twigs. Note the curved "Shepherd's Crook" at the tip of the infected twigs.



Fire blight canker on apple trunk.

through natural openings, such as lenticels and stomata, under conditions of prolonged rain and high humidity. However, shoot infection more commonly occurs through wounds created by sucking insects, such as aphids, leafhoppers, and tarnished plant bugs; by wind whipping; or by hail. Fire blight bacteria multiply rapidly within an infected shoot. Droplets of ooze can form on the shoots within 3 days. Shoots remain highly susceptible to infection until vegetative growth ceases and the terminal bud is formed.



Control

Fireblight is one of the most difficult diseases of apple to control, and there is no one procedure that will give complete control. Though control is not an easy task, the use of several practices in an integrated manner should result in minimal damage from fire blight.

1. Plant apple, crabapple, and pear varieties that are less susceptible to fire blight. Fireblight is not as severe a disease problem on most crabapple varieties. A few crabapple varieties which can develop severe fireblight include: Silver Moon, Snowdrift, Red Jade, and Van Esseltine.
2. Prune out fire blight cankers and blighted twigs. To decrease the inoculum level for the following season, prune out blighted twigs and cankers during the dormant season. During the dormant season (winter) there is much less chance of spreading bacteria. Branches that are more than half-girdled by cankers should be removed. Cut off blighted twigs by making cuts at least 4 inches below the visible dead wood. Cankers can be cut out of trunks or large branches by removing dead tissue down to wood that appears healthy. If blighted twigs are pruned out during summer, cuts should be made 12 to 15 inches below diseased wood and pruning tools should be disinfested by dipping in a 2: 10 solution of household bleach in water after each cut.
3. Follow proper pruning and fertilization practices. Excessive nitrogen fertilizer and heavy pruning will promote vigorous growth of succulent tissue which is more susceptible to fire blight. Adjust management practices on susceptible varieties to promote moderate growth. Make fertilizer applications in early spring or late fall after growth has ceased.
4. Sucking insects create wounds through which fire blight bacteria can enter. These pests should be controlled throughout the growing season. To protect bees, do not apply insecticides during bloom.
5. Commercial growers should consider following a recommended spray program for fire blight. Sprays for fire blight control are generally not recommended for backyard growers. Instead, backyard growers are encouraged to plant less susceptible varieties and use other non-chemical control measures.

Information obtained through the Ohio State Extension Fact Sheet HYG-3002-94

