

Cooperative Extension---The Pennsylvania State University

Plant Disease Facts

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FIRE BLIGHT

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Fire blight is a disease caused by the bacterium *Erwinia amylovora*. This bacterium can attack more than 75 species of trees and shrubs including apple, pear, quince, mountain ash, crabapple, hawthorn, cotoneaster, serviceberry, and pyracantha. The bacterium overwinters on infected plants in darkened, slightly sunken cankers. In the spring, the bacteria are dispersed by insects, rain, wind, and animals.

SYMPTOMS:

- Twigs, branches, and leaders on trees and shrubs wilt and blacken, especially during flowering.
- Affected twigs and branches may bend over into the shape of shepherd's crook.
- Blackened flower parts remain attached to the tree.
- Cream-colored liquid may ooze out of the cankers and run down the trunk and branches in the spring if conditions are very wet.

LIFE HISTORY:

The bacterium is carried from infected tissue or from liquid oozing from the infected tissue to natural openings or wounds in susceptible plants 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. 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 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.

FAVORABLE CONDITIONS:

- Fertilization practices that produce very succulent growth render plants more susceptible to fire blight.
- Moderately high temperatures (70°-81°F = 21°-27°C), high relative humidity, and rainfall during flowering provide optimum conditions for fire blight development.
- Injury due to hail or windblown soil opens tissue to infection.

MANAGEMENT:

- Grow resistant varieties whenever possible.
Crabapple cultivars with resistance: 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.

Mountain ash: *Sorbus aucuparia* and *S. intermedia* are resistant.

- Do not purchase or plant infected material. Plant only fire blight-free trees and shrubs.
- Remove severely infected plants.
- Once the disease has begun, a 3-pronged management scheme must be implemented:
 1. During the dormant season, closely examine susceptible plants and prune out infected tissues. Look for blackened twigs, branches, and flower parts. Find the sunken, darkened cankers on the wood. Prune when the weather is dry, cutting at least 4 inches below the canker. Disinfect pruning tools between cuts by placing them in 70% alcohol or hydrogen dioxide and letting them air dry.
 2. **During the growing season, do not prune infected tissues.** 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).

3. To plants for which copper or copper + mancozeb, phosphite salts, fosetyl-Al, or potassium salts of phosphorus acid is registered, apply it before bud break. *Some populations of *Erwinia amylovora* are resistant to copper.

FRAC Group	Risk No. Level	Class	Active ingredient	REI Restricted Entry Interval	Trade names (EPA Reg. no.)
M	1	Copper, complex	copper sulfate	12	Camelot (1812-381), Phytol 27 (49538-3)
		Copper, fixed	copper hydroxide	48	Kocide (352-656), Champion (55146-1)
		Dithiocarbamate	mancozeb	24	Dithane (707-180), FORE (707-87), Pentathlon (1818-251)
			manganese + zinc	24	Protect T/O (1001-65)
U	1	Phosphonate	fosetyl-Al	12	Aliette (432-890)
		Phosphite	phosphorus acid salts	4	Alude (71962-1-1001)
			potassium phosphate	4	Vital (42519-24)
Combined products	1		mancozeb + copper		Junction Fungicide (1812-360)

Fungicides and Fungicide Resistance Management - Certain fungicides, usually systemic fungicides, are said to be 'at risk' to the development of resistance if they are used repeatedly. See the Risk Level in the above table (1 = low risk; 3 = high risk). The Fungicide Resistance Action Committee has developed a numbering system in which chemicals with the same FRAC Group number have the same mode of action (See <http://www.frac.info/frac/index.htm>). It is recommended that chemicals at high risk be used sparingly.



Fire blighted flowers.



Fire blighted twig.



Note discolored area of canker just under the bark.

NOTICE: THE USER OF THIS INFORMATION ASSUMES ALL RISKS FOR PERSONAL INJURY OR PROPERTY DAMAGE. WARNING! PESTICIDES ARE POISONOUS. READ AND FOLLOW ALL DIRECTIONS AND SAFETY PRECAUTIONS ON LABELS. HANDLE CAREFULLY AND STORE IN ORIGINAL LABELED CONTAINERS OUT OF THE REACH OF CHILDREN, PETS, AND LIVESTOCK. DISPOSE OF EMPTY CONTAINERS RIGHT AWAY, IN A SAFE MANNER AND PLACE. DO NOT CONTAMINATE FORAGE, STREAMS OR PONDS.

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