



No. 35

Extension Bulletin E-841

March 1975

FIRE BLIGHT

of Trees and Shrubs

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What is it? Fire blight is caused by the bacterium *Erwinia amylovora*. This disease affects many members of the family Rosaceae. It is especially severe on pears, apples, crabapples, cotoneaster, mountain ash, quince, and pyracantha, but also affects Amelanchier (serviceberry), hawthorn, rose, and spirea.

Environmental factors: The bacteria multiply rapidly at temperatures between 65°F and 80°F. Warm, humid conditions with some rain and wind are favorable for rapid growth and spread. Insect activity and use of contaminated pruning tools also spread the fire blight bacterium.

Life Cycle: Bacteria overwinter in branch and twig cankers (Fig. 1). In spring, a gummy, white-to-orange colored ooze containing the bacteria may be produced at the canker. This ooze may be wind, rain, or insect



Fig. 1. Large overwintering canker (small arrows) on major branch. Note bacterial ooze at margin of canker (large arrow).

borne to flowers, young fruits, or new growth. The organism enters the host through natural openings and wounds. It multiplies rapidly and invades the vascular tissues of the host where it may move for some distance. Where infections are arrested by unfavorable environmental conditions or cessation of terminal growth, new cankers are formed.

Symptoms: Overwintering cankers are slightly sunken and darker than surrounding tissues, usually dark brown or purplish-black in color. The bark is often cracked at the margin of the canker (Fig. 1), however, for some cankers, this does not occur thus making it difficult to distinguish between necrotic and healthy tissue (Fig. 3).



Fig. 2. Young shoot, recently killed. Note the dark leaves and "shepherd's crook" appearance of the shoot tips (arrows).

Fire blight often attacks blossoms and young fruits. In Michigan, growing shoots and water sprouts can also be severely affected (Fig. 2). Affected tissues wilt and turn dark brown to black (Fig. 3). Leaves shrivel and dry up, but remain attached. Twig and flower spur infections may progress toward the trunk involving whole twigs. Blighted twigs have a "shepherd's crook" appearance (Fig. 2). Where branches are invaded but not killed, overwintering cankers are formed.

Control: Plant resistant varieties whenever possible. Several species and cultivars of crabapples and ornamental pears have good resistance. In susceptible plants, only rigid sanitation will keep the disease under control. All cankers should be pruned-out in winter, 3 to 4 inches below the last visible margin of the infection site. Large pruning cuts should be treated with a wound sealer containing a disinfectant. In summer, it is best to *break out* affected twigs. If pruning is done, tools should be frequently disinfected with alcohol, oxine (75 ppm), or chlorox (10% solution) to avoid spreading bacteria to healthy tissues.

Protective sprays of streptomycin sulfate (60 to 100 ppm) or Bordeaux mixture applied in the spring will help prevent or reduce infections. Spraying should start when plants begin to bloom and temperature (65°F or above) and moisture (high humidity) conditions are favorable for bacterial growth. Repeat sprays at 5 day intervals if favorable conditions prevail during bloom. If blight has been a problem, spray should be applied at 7 to 10 day intervals until terminal growth stops. Caution: Streptomycin sulfate is not registered for use on all crops affected by fire blight, consequently Bordeaux mixture may be the only product which can be used to provide some control. Bordeaux should be applied under conditions where plants will dry as rapidly as possible to avoid possible phytotoxicity problems.

The production of succulent growth also favors fire blight development. Hence, irrigation and fertilization should be carefully regulated to avoid succulent growth, especially in the spring and early summer.

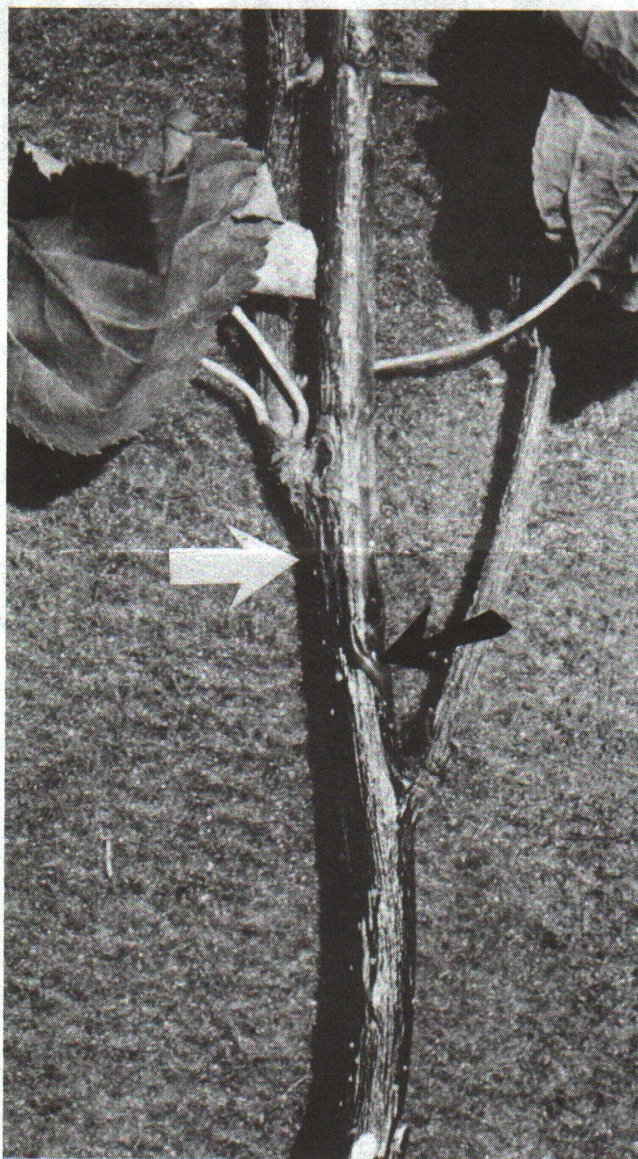


Fig. 3. Young blighted twig. White arrow indicates the margin between dark, bacterial affected tissue below and uninvaded tissue above. Bacterial ooze is also present on the affected tissues (black arrow).