



X-DISEASE OF STONE FRUITS

X-disease is a serious disease of peaches, nectarines, and sweet and sour cherries. The disease also has been reported on chokecherry. X-disease is caused by a phytoplasma, which lives in phloem cells of plants. Phytoplasmas are a group of small, parasitic organisms that are slightly smaller than bacteria (Figure 2, D).

Symptoms

Symptoms on peach.

Symptoms are predominantly foliar (Figure 1), but the fruits may also be affected. The first symptoms occur on foliage in midsummer. Leaves on isolated branches curl inward and develop irregular, yellow to reddish or purple spots (Figure 1, A and C). The spots soon drop out, leaving shot-holes (Figure 1B). Leaves on affected branches fall prematurely, starting at the base of the branch.

Eventually, only a tuft of leaves remains at the tips of infected shoots. Fruit set may appear normal at first, but fruit on infected limbs will drop prematurely.

A good diagnostic symptom is the presence of apparently healthy twigs or branches with normal-looking leaves mixed with twigs or branches showing the symptoms described above. This mixture of healthy and diseased branches on the same tree occurs primarily during the first and second years of infection. Two to three years after initial infection, most branches will show symptoms.

Symptoms on cherry. There are two major types of reaction to X-disease in cherry trees. Trees of cherries on Mahaleb rootstock show symptoms suddenly in midsummer (Figure 2, A) and may die.

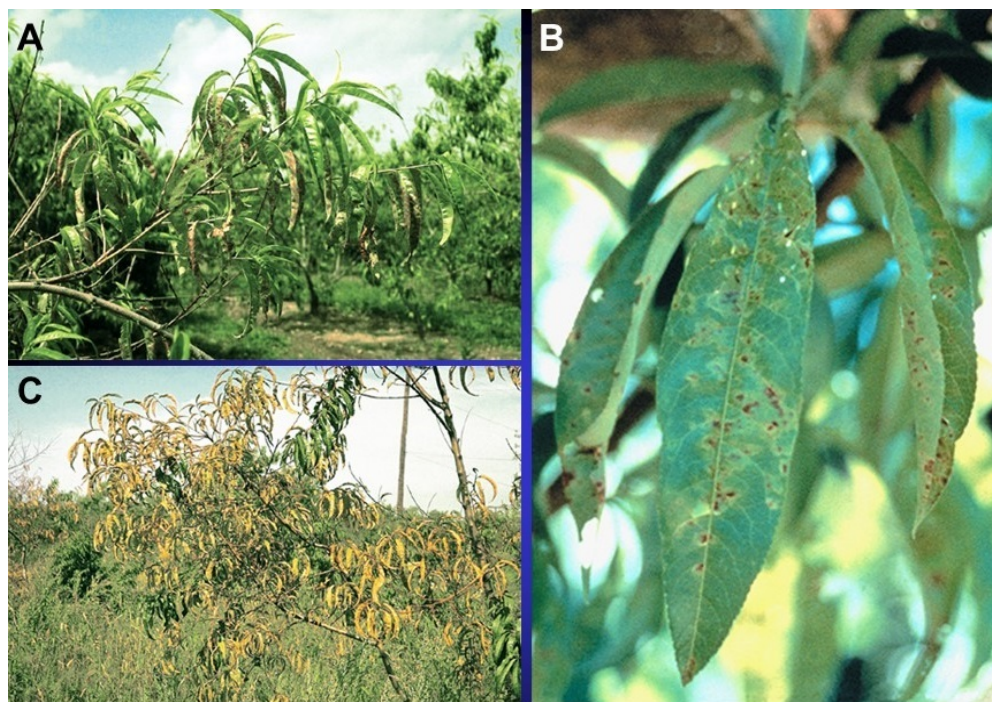


Figure 1. Peach trees with X-disease. A, Leaves with rolling and red blotch; B, Leaves with chlorotic and necrotic lesion; and C, Leaves with yellowing. (Courtesy: The American Phytopathological Society).

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Trees on Mazzard rootstock decline slowly. Infected sweet cherry trees on Mazzard rootstocks may not show decline for many years; often the only recognizable symptom is on the fruit (Figure 2, B). Scattered fruit on trees propagated on Mazzard rootstock are small and pink at harvest and have a bitter flavor.

Life cycle

Phytoplasma of X-disease of stone fruits can be transmitted by several species of leafhoppers (Figure 2, C). Some of vectors that have been identified are *Fieberiella florii*, *Collabonus montanus*, *C. geminatus*, *Scaphytopius acutus*, and some *Paraphlepsius* and *Osbornellus* species. These leafhoppers are usually not pests of peach and cherry. They feed during the day on plants in the orchard ground-cover and at night they move to peach and cherry trees.

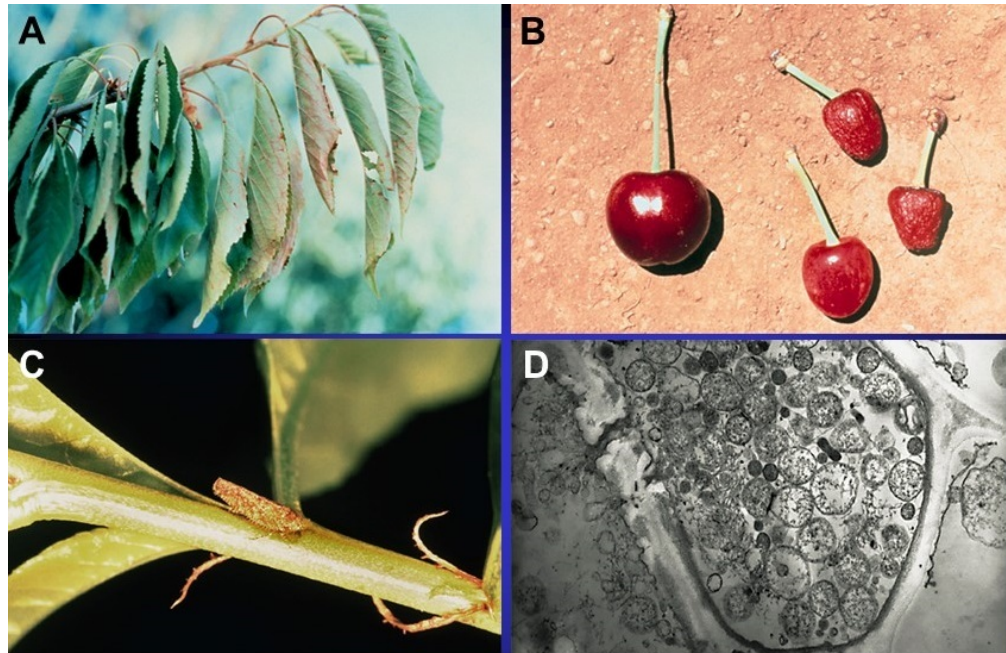


Figure 2. Stone fruit X-disease. A, Cherry terminal leaf symptoms (upward folded leaves and reddish color); B, Triangular-shaped cherry fruits with short pedicels; C, A leafhopper that can spread X-disease; and D, Cross-section of a vein in a peach leaf with X-disease. The spherical bodies are phytoplasmas. (Courtesy: The American Phytopathological Society).

Leafhoppers acquire phytoplasma from the leaves of X-disease-infected chokecherry, sweet cherry, or sour cherry. Two to three weeks later, they can transmit the pathogen to healthy leaves while feeding on them. Tree to tree spread from cherry trees with X-disease to adjacent peach orchards can be particularly important. The possibility of spread from peach to peach has been investigated and it appears to be of minor importance.

Disease management

The following practices have been recommended for managing X-disease of stone fruits. Eradication of chokecherries near stone fruit orchards helps to control X-disease. Infected cherry trees, particularly those on Mazzard rootstock, also should be removed. Brush killers offer the cheapest and most effective way to kill the chokecherry bushes with both summer and autumn spray treatments. Other methods include bulldozing, deep plowing, burning, or pulling out individual bushes. During the growing seasons following removal, the treated area should be checked carefully for chokecherry sprouts. Sprouts or new chokecherry seedlings should be treated with herbicide sprays or pulled out during the summer.

Reducing populations of leafhopper vectors is another approach for managing X-disease in stone fruits. Maintaining a vigorous insect control program from June through harvest with insecticides effective against leafhoppers should be useful in reducing spread of the disease.

Temporary symptom remission can be obtained with post-harvest injections of oxytetracyclin into the trunk. In nurseries, X-disease can be transmitted by grafting as well as by leafhoppers. Budwood trees should be examined periodically for symptoms of X-disease and infected trees should be removed