A2537

Maple and other trees disorder: Verticillium wilt

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When individual branches of a tree suddenly wilt and die while the remainder appears healthy, Verticillium wilt may be the culprit.

In addition to maples, this disease affects a wide range of deciduous trees and shrubs, including ash, barberry, catalpa, elm, linden, Russian olive, smoke-tree, and redbud. Vegetable crops such as tomatoes and potatoes are also susceptible. Evergreens are resistant. Verticillium wilt can be found throughout the state, but is more common in southern Wisconsin.

Newly infected trees usually show sudden wilting and dying of individual branches while the remainder of the tree appears healthy.

Symptoms and effects

This is a disease of the water-conducting tissues that affects many parts of the tree. Both external and internal symptoms should be considered when identifying this disease.

External

Usually the first external symptom is sudden wilting of leaves on one or several twigs on a branch. The initial symptoms may go unnoticed until an entire branch or the whole crown displays wilt symptoms. A general yellowing of foliage sometimes precedes wilting, or leaves may become pale green while drying rapidly. Most plants first show leaf symptoms in June or July. Some trees may display symptoms as early as May and as late as October.

On ash species, leaves initially turn light green to yellow. As the disease progresses, leaves take on a scorched appearance with irregularly shaped dead areas. Eventually the leaves fall off and the branch dies back.

Other symptoms that may indicate Verticillium wilt are general decline in new twig growth, dieback of individual twigs and branches, and general yellowing of the foliage. Occasionally maples and tuliptrees develop elongated dead areas of bark on diseased branches or trunk where the inner bark is killed. Water-soaked areas sometimes develop under the killed bark. Bark loosening and splitting may then occur between living and dead tissue.

Plants that develop a small amount of branch wilt during the summer may show increased wilt and dieback the following year, whereas others may recover and not wilt in succeeding years. Plants having severe or general wilt throughout the crown usually die before the end of summer.

Although trees of any age may be infected, it is more commonly observed in young trees.

Internal streaking in the sapwood is typical of wilt infection. Sometimes only one or a few such streaks are evident.

Internal

Internal symptoms include sapwood discoloration which occurs in branches showing advanced foliage wilt. The discoloration is usually found by making a long slanting knife cut across the end of a branch sample. Variations in discoloration depend upon the particular species of tree infected. In most trees Verticillium wilt produces streaks of various shades of brown in the sapwood just under the bark. Infected maple and sumac show light to dark green streaks; ash trees rarely show streaking.

Cause

The fungus *Verticillium dahliae* is parasitic on the living tissues of many plants and can also live indefinitely in the soil. It can enter plants through wounds on roots, branches, or trunks. Crops such as tomato, potato, and pepper are particularly susceptible to Verticillium wilt. When woody ornamentals are grown in areas that had been planted to these susceptible crops, they may become infected.

Identification

Field identification of this disease is fairly certain when branches with typical external symptoms show extensive streaking in the sapwood.

For laboratory confirmation, submit samples between late May and early September only. Collect branch sections from more than one wilting branch if possible. Ideally, samples should be ½ inch in diameter and 6 inches long. If wood discoloration is difficult to find, take samples from branches that bear both recently wilted leaves and green leaves. For disease detection in ash, submit recently affected leaves along with twig samples since the fungus is most easily isolated from leaf petiole tissue. Shrubs should be sampled from the base of the wilting branch or stem. Place the material in a plastic bag to prevent drying and mail it immediately with appropriate information to the Plant Industry Division, Wisconsin Department of Agriculture, 4702 University Avenue, Madison, Wisconsin 53705.

Control

The best strategy is to use good cultural techniques to reduce stress to affected plants. Immediately water any trees suspected of wilt infection unless soil is already quite moist. Prevent moisture stress during dry periods by watering at 10- to 14-day intervals with the equivalent of 2 inches of rainfall.

Michigan researchers suggested that fertilizing with ammonium sulfate to stimulate growth may benefit infected trees. Fertilizers containing nitrates were of no benefit.

Dead branches should be pruned out. Clean and sanitize pruning tools with rubbing alcohol or equivalent before reusing.

When replanting in an infected area, select a resistant tree or shrub. The following species appear to be resistant: beech, birch, ginkgo, hackberry, hawthorn, hickory, honey locust, mountain ash, white and bur oak, poplar, serviceberry, sycamore, and willow.

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