

VERTICILLIUM WILT OF ORNAMENTALS

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What is it?

Verticillium wilt is a vascular disease which attacks a wide variety of trees, shrubs and herbaceous ornamentals. The disease is caused by a fungus, *Verticillium albo-atrum*, which lives in the soil and enters the plant through the roots. In the plant, the fungus spreads upward, mainly in the wood, disrupting water movement and normal plant functions.

Symptoms

The disease may appear in mild, chronic or lethal form. Poor vigor and sparse growth may be the only symptoms (Fig. 1). Yellowing, marginal and interveinal browning, wilting and/or death of leaves may occur. The affected plant typically shows symptoms of mild to severe water stress. These often appear in one branch or one

side or sector of the plant (Fig. 2). In its lethal form *Verticillium* will cause a sudden and total collapse of the plant. The wood of affected plants shows discoloration in the form of streaks or bands (Fig. 3). These streaks may be scattered throughout the wood if the plant is chronically infected or may be confined to new sapwood in a new attack (Fig. 4). The color of the streaks can be from grayish to olive green (maples), to brown or near black in locust and elm. Streaks should be looked for at the base of the wilted branch or twig or in the trunk or roots on the affected side of the plant.

The above symptoms are not conclusive evidence of *Verticillium* wilt, as other diseases can cause similar symptoms. Positive identification can be made only by laboratory tests. Contact your County Cooperative Extension Service Office if you wish such tests to be made.



Fig. 1. (Left) Tree with a chronic *Verticillium* infection. The plant may persist in this condition for several years. Fig. 2. (Center) Note defoliated branch and one-sided flagging (arrows) of *Verticillium* affected tree. Fig. 3. (Right) Complete ring in current year's growth indicates why this branch died. Note initial *Verticillium* infection occurred 2 years earlier.



Fig. 4. Scattered streaks indicate a chronic infection, while streaks confined to the current year's growth indicate a new attack.

Trees and shrubs known to be susceptible to *Verticillium* wilt:

Ash, (Black, Blue European, Green and White)
 Azalea (*Rhododendron molle*)
 Barberry, Japanese
 Boxwood, Korean
 Catalpa, Western, Northern and Southern
 Cherry
 Elm, American and varieties Augustine Ascending, Henry Field, Littleford, and Moline Chinese (*Ulmus parvifolia*)
 English Slippery
 Goldenrain tree
 Grapes
 Horsechestnut
 Kentucky coffee tree
 Lilac
 Linden, American and Little leaf
 Locust, Black
 Magnolia, Saucet and Star
 Maple, Amur, Black, Hedge, Norway, and varieties Crimson King and Schwedleri, Red, Silver and Sugar
 Oak, Pin and Red
 Peach
 Pear
 Plum
 Privet, Amut
 Redbud
 Rose daphne
 Rose, Multiflora (most cultivated roses)
 Russian olive
 Sassafras
 Smoketree
 Sour gum
 Spirea
 Sumac, Fragrant, Smooth and Staghorn
 Tree-of-heaven
 Tulip tree
 Viburnum

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Replacement Species

Arborvitae
 Beech
 Birch
 Fir
 Flowering crabapple
 Ginkgo
 Hackberry
 Hawthorn
 Hickory
 Holly
 Honey locust
 Hop hornbeam
 Hornbeam
 Juniper
 Larch
 Mountain ash
 Mulberry
 Oak, white and burr
 Pawpaw (*Asimina*)
 Pine
 Poplar
 Pyracantha (firethorn)
 Serviceberry
 Spruce
 Sweet gum
 Sycamore
 Willow
 Zelkova

Care of infected plants

There is no chemical cure available for *Verticillium* wilt. Trees showing general or severe wilt cannot be saved and should be cut down and disposed of by burning or removal to a dumping area. Infected wood **should not be chipped** (unless it is thoroughly heated in a compost pile manner) as the fungus can live for some time in chips and can grow as a saprophyte in the soil if adequate organic matter is present. In this manner, chip mulch could spread the disease.

Mild and chronically affected trees should be watered regularly to prevent water stress. Nitrogen fertilization to stimulate vigorous growth is also recommended. Prune out and destroy weak and dead branches.

Future plant selection

Where *Verticillium* wilt is found or suspected, resistant or tolerant species should be used in replacement plantings. If susceptible species must be used, soil fumigation by a licensed professional is required.

Verticillium wilt is not known to occur in yews and conifers. Also, a number of broadleaf species are not known to be susceptible to this disease. The species listed in the adjoining left column should be considered as replacement species for plants killed by *Verticillium* wilt.