

Verticillium Wilt
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Verticillium Wilt is a serious disease of hundreds of plant species including crop plants and landscape trees and shrubs. *Verticillium dahliae* is the name of the fungus responsible for wilt on woody plants. It is a soil-borne organism that produces symptoms on its host, but no obvious signs of itself. Of course, if everyone was lucky enough (strange enough?) to have their own microscope, life stages of the fungus including its spores and microsclerotia (dark, cellular clusters) could be seen. We lack information on *Verticillium* biology on woody plants, its longevity and prevalence in urban soils, and how horticultural practices such as fertilizing, mulching and amending soils might affect the disease. Thus, Verticillium Wilt, in all its mysterious glory, is rather difficult to diagnose and is probably over-diagnosed. Whenever a susceptible plant such as maple, smoketree or redbud (to name a few) display dying branches and dieback, it is frequently assumed to have Verticillium Wilt. To be sure, *Verticillium* is a soil inhabitant throughout temperate regions of the world and causes a lot of plant problems in our region, but be sure to consider the following points before deciding on a "causal agent":

- 1) First eliminate other, more easily determined probable causes, such as girdling roots and stem cankers. Both can result in "flags" (branches with dying and dead leaves) and give the appearance of wilt;
- 2) Refer to host lists to check whether the affected plant is susceptible or resistant to wilt. The Arboretum's Plant Information Leaflet on Verticillium wilt contains this information as do the University of Illinois Extension leaflets and other bulletins.

Good web sites:

<http://www.ipm.iastate.edu/ipm/hortnews/1998/3-13-1998/verticil.html>
<http://ohioline.ag.ohio-state.edu/hyg-fact/3000/3053.html>
<http://www.ag.uiuc.edu/~vista/abstracts/aVERTWILT.HTML>

- 3) Verticillium Wilt, like other wilt diseases, usually causes vascular streaking in branches or the trunk of a tree, so peel back the bark of larger limbs to check this out. Other symptoms include overall stunting of a plant and leaf chlorosis, followed by necrosis and sometimes defoliation. These symptoms, along with wilting, typically begin on lower or outer branches of trees and will re-occur year after year;
- 4) Laboratories such as at the University of Illinois Plant Clinic (1401 St. Mary's Road, Urbana, IL 61802) can help to confirm your suspicions.

Once a proper diagnosis has been made, how does one manage Verticillium Wilt in the landscape? As always, foresight wears coke bottle glasses and hindsight is 20/20. Using resistant plants in areas known to have *Verticillium* is the best strategy. Treating soil, seed and propagative materials that can transmit the fungus is also essential. Heat treatments will normally suffice so long as temperatures reach at least 130-140° F. According to literature on agronomic crops, there are a number of strategies to minimize the disease where it already exists:

- 1) **Maintain a moderately acidic soil** through mulching (hardwood bark is a good source) and amendments (ammonium sulfate). Low pH makes elements available that are toxic to the fungus but good for plants, such as Manganese. Low pH soils also allow antagonistic bacteria and fungi to multiply and compete with *Verticillium*.

2) **Maintain a balanced fertility and use an ammonium or urea source of nitrogen** Unbalanced nitrogen (too high or too low), too low potassium (which becomes deficient in plants infected with Verticillium) and too low phosphorous can lead to more disease. Nitrate sources of nitrogen have been correlated with more disease.

3) **Do not overwater** as the lower soil temperature may hasten disease in addition to creating plant stress.

4) Most important: if inoculum (microsclerotia and spore) levels are too high in the soil, none of the above tactics will work. **Remove susceptible plants and plant debris** or they will act as reservoirs of the fungus and increase the inoculum "load" of the soil.

Woody ornamentals that are not known to be susceptible to verticillium wilt:

Apple

Arborvitae
Aspen
Bald cypress
Beech
Birch
Boxwood, Korean
Crabapple
Dogwood
Fir
Firethorn (pyracantha)
Ginkgo
Hackberry
Hawthorn
Hazelnut
Hickory
Holly
Honey locust
Hophornbeam
Hornbeam
Juniper
Katsura-tree
Larch
Linden
Mountain-ash
Mulberry
Oak, white and bur
Pawpaw
Pear
Pecan
Pine
Planetree, London
Poplar
Serviceberry
Spruce
Sweet gum
Sycamore
Tree-of-heaven
Walnut
Willow
Yew
Zelkova