

## A fungal disease of the vascular system in trees

Verticillium wilt is a fungal disease that grows in the vascular tissue that conducts sap in the tree. The fungus attacks a wide range of trees and shrubs. Verticillium is frequently misdiagnosed. Symptoms of Verticillium wilt can be very similar to those of stem girdling roots, a much more common problem for trees in urban landscapes.

## What to expect from trees infected with Verticillium

There are many strains of Verticillium, ranging from mild to very aggressive in their ability to infect trees and shrubs. Trees may die in one season or gradually branch-by-branch over several growing seasons, depending on the strain of Verticillium, the type of tree infected, and the degree of stress from other factors on the tree.

## What to look for

- Branch dieback on one side of the tree
- Small stunted leaves, appearing scorched with yellow margins, turning brown and dry
- Greenish to brown streaks, flecks or bands in a cross section of an affected branch
- Poor growth and an abnormally large number of seeds on the tree

## Life Cycle

Verticillium often arrives in the landscape on infected nursery material, but it may also be introduced by wind-spread spores. Infection occurs during warm weather when the fungus enters the tree through wounds in the root system or by directly penetrating the roots. As the fungus moves through the tree, it clogs the water and nutrient conducting vessels, resulting in wilt and branch dieback symptoms. Dead tissue falls from the tree, and in the process the fungus is re-introduced into the soil or is spread by wind to new areas. The fungus is able to survive in infested soils for ten or more years in the soil.

## Treatment and Prevention

Verticillium wilt is not directly treatable with any labeled fungicide. Encouraging tree health can make host plants less susceptible to infection or progression of the disease. Proper watering, mulching, and pruning to remove dead and dying parts may help with mild cases of Verticillium. Planting resistant trees is the best method of control. This is especially important in locations where trees have died previously from Verticillium wilt. Wood from infected trees should be removed from the site (not used as mulch).



Wilted scorched foliage



Staining is visible in cross section of wood sample from Verticillium



Staining is visible under bark

### Trees and Shrubs Susceptible to Verticillium

Ash	Cherry	Lilac	Russian Olive
Azalea	Cork Tree	Magnolia	Serviceberry
Barberry	Currant	Maple	Smoke Tree
Boxwood	Elm	Plum	Spirea
Buckeye	Horse Chestnut	Redbud	Sumac
Catalpa	Kentucky Coffee Tree	Rose	Viburnum
			Weigela

### Trees and Shrubs Resistant to Verticillium

All Conifer species	Ginkgo	Mulberry	Walnut
Apple and Crabapple	Hackberry	Oak species	Willow
Mountain Ash	Hawthorn	Pear	
Beech	Hickory	Poplar	
Birch	Honeylocust	Sycamore	
Butternut	Hornbeam		
Dogwood	Linden		

