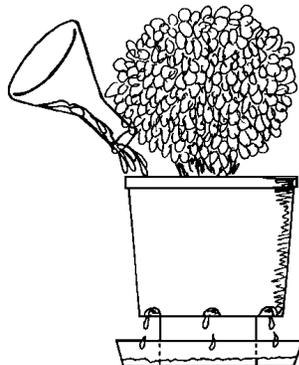


## Diseases Appearing in July

This month, the bulletin will be focusing on on four diseases of ornamental shrubs with symptoms likely to be appearing in July: Verticillium wilt, Phytophthora root rot, Black root rot, and Passalora needle blight.

**Just a reminder** to growers, especially at this point in the season, container plants will be rapidly taking up soil nutrients, so it may be worth the labor to evaluate current nutrient availability by performing a pour-through, as is described in this short video [The Pour-Through Technique for Nursery Crops](#). Fast growing crops can act as an indicator plant for nutrient deficiencies, as they will show symptoms first (chlorosis/yellowing, etc.) More information, including desired readings, are also available in [this short fact sheet](#).



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Vascular streaking, discoloration in maple wood, bark removed—Image U Illinois Extension

## In This Issue

- Verticillium wilt
- Phytophthora root rot
- Black root rot
- Passalora needle blight



Verticillium wilt on maple;

Image—University of Illinois Extension

## Verticillium wilt

### Host Plant(s)

*Magnolia, Redbud, Smokebush, many others*

### Pathogen

*Fungus*

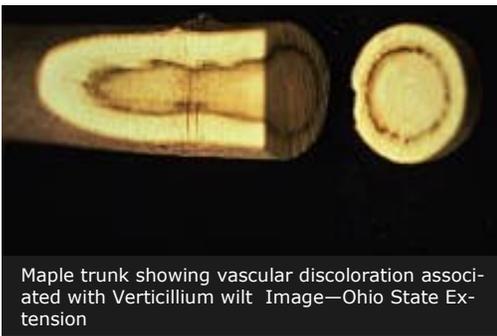
**Symptoms:** Verticillium wilt is associated with the sudden death of mature trees, shrubs, perennials and vegetables. Sometimes plants wilt, but more often foliage turns brown and dies over a period of weeks or months, often on one side of the plant. Once the fungus enters the vascular tissues of the host plant, it is likely to spread quickly, blocking water from moving within the plant and causing death. Other symptoms include marginal browning and scorch of leaves, abnormally large seed crops, small leaves, stunting, poor annual growth, and sparse foliage. Late season infections may not be noticeable until plants come back out of dormancy.

### **Diagnosis:**

While all of the above symptoms can be caused by other stress factors, a good field symptom that can set Verticillium wilt apart is the discoloration of xylem and cambial tissue, visible as streaks if you cut into the wood (see image on first page). This discoloration varies between those species: greenish to blackish on maple, yellowish green on smoketree, brown on ash.

### **Control:**

*Verticillium* lives in the soil for many years, even without a host plant, making host ration difficult. Wounding of root tissues and drought conditions favor development of the disease. Keeping plants as healthy as possible is a good strategy: proper water management, good fertility program and pruning out dead branches are all highly recommended. Sanitize frequently when pruning roots and canopy. Fungicides are not effective.



Maple trunk showing vascular discoloration associated with Verticillium wilt. Image—Ohio State Extension

## Phytophthora root rot

### Host Plant(s)

*Azalea, common gardenia, begonia, many others*

### Pathogen

*Fungus*

**Symptoms:** Phytophthora kills the roots and crown of infected plants. It reduces the volume of roots and limits water uptake. Wilted foliage, even when adequate water is present. Yellow or bronze foliage, branch dieback and overall poor plant vigor. Death is common.

**Diagnosis:** Look for symptoms during the growing season, when temperatures are high and plants are actively growing. Infected roots may be tan to brown to cinnamon in color; conifers may lack white root-tips. Many symptoms may be confused with a nutritional disorder, over watering or under watering. Make use of the diagnostic lab, available through your county Extension Agent.

**Control:** Maintain potting mixes, propagation and growing areas free of contamination. Remove all old rooting media, old roots, and other plant debris, paying close attention to propagation areas. Use potting mixes with excellent drainage, including sand and composted bark without many fine particles. Avoid peat moss and sawdust. Do not overwater or overfertilize plants. Immediately isolate suspect plants while awaiting results of diagnosis. Remove and discard diseased plants and potting mix. Sanitize tools and hands that have come in contact with contaminated soil. Fungicides containing metalaxyl, mefonoxam or propamocarb will provide some protection if used before disease develops.



Phytophthora root rot on azalea. Note chlorosis, sparseness, and small size of leaves

Image—NCState Extension



Phytophthora infected roots, reddish-brown rotted areas will later turn black.

Image—UK Extension Plant Pathology



Inkberries with black root rot—Image, UK Extension, C. Kaiser

## Black root rot

### Host Plants

*Japanese and blue hollies, inkberry, Pansy petunia, vinca, many others*

### Pathogen

*Fungus*

### Symptoms

Black root rot results in the decay of root systems, however obvious symptoms are observed on above-ground portions of the plant. Plants may appear stunted, slow-growing or less vigorous. Yellowing, wilting, and necrosis occur on leaves. Herbaceous plants may collapse while woody plants show dieback. Severely infected plants eventually die.

### Diagnosis

Root symptoms begin as dark brown / black lesions that contrast to healthy white portions of roots. Lesions often begin in the middles of roots and expand in both directions. The pathogen can persist indefinitely in soils or survive on plant debris, obtaining nourishment from decaying organic matter.

### Control

Strict sanitation is crucial in nurseries and greenhouses where black root rot can be a serious problem. Do not reuse soil. Disinfect all tools, equipment, containers and greenhouse floors. Use disease-free stock plants. Monitor regularly, especially if the greenhouse/nursery has a history of black root rot. Dispose of all infected plants, regardless of disease severity. No curative fungicide is available.

### More information:

[Black Root Rot of Ornamentals Plant Pathology Fact Sheet](#)



Leaf yellowing and scorch symptoms of a dying shoot from a black root rot infected blue holly.

Image: UK Extension

## Passalora needle blight

### Host Plants

*Arborvitae, Cherry Laurel, Juniper, False Cypress, Leyland cypress*

### Pathogen

*Fungus*

### Symptoms

Needle blight usually first infects the interior, lower foliage and with time spreads outwards and upwards. Look for discoloration on lower branches. Symptoms can range from yellowish to reddish to brown foliage and on severely-infected branches foliage loss.

### Diagnosis

The pathogen is currently called *Passalora sequoia*, though it was previously called *Cercosporidium*, *Cercospora*, and *Asperisporium*. If you have a good hand lens, beginning in late June examine lower, interior branches looking for abnormal or damaged tissue on last year's growth. Look for dark, raised "bumps" on dead tissues. Look for greenish-grey tufts of spores.

### Control

Scout for needle blight on Leyland Cypress. Apply cover sprays of Fore or Daconil Ultrix if historically a problem. Early application of fungicides can limit new infections and even allow infected tissues to green up before the end of the growing season.



Alan Windham, ©2010, University of Tennessee

Spore forming structures visible on infected needles—Image A. Windham, UT Extension



Blighted lower canopy—Image Steven Jeffers, 2010 Clemson Extension

The University of Kentucky's **Nursery Crop Extension Research Team** is based out of two locations across the bluegrass to better serve our producers.

The **University of Kentucky Research and Education Center (UKREC)** in **Princeton** serves western Kentucky producers while our facilities and personnel on main campus in **Lexington** serve central and eastern Kentucky producers.

Check out our [YouTube Channel!](#)

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