



UNIVERSITY OF ILLINOIS EXTENSION

# HOME, YARD & GARDEN PEST NEWSLETTER

College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign  
Illinois Natural History Survey, Champaign

No. 8 • June 9, 2004

## Greenhouse Management Workshop

The Sixth Annual Greenhouse Management Workshop will be August 12, 2004, in Bloomington at the University of Illinois Extension office, 402 North Hershey Road. The workshop is scheduled from 9 a.m. to 4 p.m. The registration cost is \$30 per person for Illinois Greenhouse Association members and \$45 per person for nonmembers. Preregistration must be received by July 31, 2004. If you have any questions, please contact Raymond A. Cloyd at (217)244-7218, phone; (217)244-3469, fax; or rcloyd@uiuc.edu, email.

## PLANT DISEASES

### Verticillium Wilt Not Always To Blame

Verticillium wilt is a fungal disease of the vascular tissue of many plants. The fungus infects the plant's vascular system and thereby inhibits flow of water and nutrients. Usually when *Verticillium* infects, the plant wilts and dramatically dies. Sometimes, however, decline occurs over several years. Often *Verticillium* is blamed for the death or decline of a tree merely because wilting and death occur suddenly. In fact, many factors that can cause Verticillium-like symptoms.

One of the most diagnostic features of Verticillium infection is the appearance of a stain or streaking of the vascular tissue. This discoloration is usually brown or dark green. It can be seen as a ring of discoloration (or parts of a ring) when an infected branch is cut and the cut end examined. The stain has a streaked appearance when the bark is peeled back from the wood and viewed along the length of the stem. A positive diagnosis can be made by culturing the stained wood in a laboratory, isolating and identifying the *Verticillium* fungus. *Verticillium* does not always cause vascular streaking. It has been documented that infected ash trees do not always show vascular streaking.

Staining of the wood can also result from canker infections. In most cases, that staining is in the center of the stem rather than the vascular tissue but not always. Canker stains tend to be localized around a wound or canker, and the stain does not extend to wood very far from the canker. Staining from *Verticillium* extends into new and old wood alike.

Sudden wilting and decline may occur as a result of root injury or root trauma. Extreme drought or flooding injures roots and can cause foliage to wilt. Look at the weather patterns before symptoms occurred to confirm or rule out such injury.

Construction injury (mechanical injury) to roots or compaction as a result of heavy equipment can also injure roots and result in wilting and decline. Unfortunately, such injury does not always appear until construction has been completed.

Deep planting can cause a slow decline of trees, with *Verticillium* sometimes blamed for the damage. Look for vascular discoloration before you blame this disease. Lack of trunk flare at the ground line and the presence of the first root 5 or 6 inches underground should make one suspect deep planting as the culprit.

Girdling/circling roots have been shown to be involved in the decline of many trees. They are difficult to diagnose because they are below the soil and often give no clue other than tree's decline. Look for trees that lean, with flare on only one side of the trunk, and poor growth for several years.

It is important to know whether *Verticillium* is present when considering replant options.

*Verticillium* is able to survive in the soil for many years and may infect hundreds of landscape plants. For more information on Verticillium wilt, refer to *Report on Plant Disease*, no. 1010, "Verticillium Wilt Disease," available in University of Illinois Extension offices or on the Web at <http://www.ag.uiuc.edu/%7Eevista/horticul.htm>. (Nancy Pataky)

### Wet Weather Invites Root Rots

Root rots of herbaceous plants are caused by fungi that live in the soil. Sometimes, the fungi are brought to your garden on plants or soil you place there. In other cases, the fungus may have been present but inactive as long as plants were vigorously growing. Root rots are generally more likely to occur in wet areas of the garden and early in the season when tissues are tender. In many areas of Illinois, rains have set the stage for problems with root rots. Some of the fungal pathogens we see as root rots in Illinois include *Phytophthora*, *Pythium*, *Rhizoctonia*, *Fusarium*, and *Thielaviopsis*.

Plants that are stunted, low in vigor, or slow growing—or those that wilt easily on a warm day—may be infected with a root rot. Diseased roots cannot absorb water and nutrients needed for growth. Many factors that affect root growth could cause the same symptoms as root rots. These might include factors such as flooding, drought, fertilizer injury, cool temperatures, too much shade, chemical injury, etc. Root rots may also cause the foliage to turn yellow to brown and drop prematurely, usually starting with the older leaves and moving up the plant. The severity of the root rot depends on the fungal pathogen, the susceptibility of the host plant, and the soil and moisture conditions. In fact, dry conditions following infection by a root rot pathogen causes a more rapid decline of plants.

To confirm a root rot problem, carefully remove an affected plant from the soil, place it in a bucket of water and gently move the plant around in the water to wash off the soil. If roots are washed too vigorously, all of the rotted tissue will be washed off, often leaving a white root interior that appears healthy. A healthy plant has numerous white roots that appear fibrous. It even has visible white root hairs. Roots of a diseased plant appear water-soaked and usually are some shade of brown or black. The discolored roots are often soft and mushy, while healthy roots are firm.

There are many root rot pathogens, but the major root rot fungi encountered in Illinois landscapes are *Rhizoctonia*, *Fusarium*, *Pythium*, and *Phytophthora*. In a simplified scheme, we can group the first two fungi as those causing a dry rot, often with a reddish pink cast to affected roots, as either *Rhizoctonia* or *Fusarium*. *Pythium* and *Phytophthora* can be grouped as the types causing a soft, brown-to-black rot of roots.

Control of root rots should be aimed at prevention. Use only healthy transplants. Weak plants may be diseased, and you won't save time or money if you use weak plants. As poor drainage usually goes with root rot, proper site preparation to provide good water drainage away from roots is imperative. *Pythium* and *Phytophthora* are problems on wet sites, requiring moisture to infect. Use a balanced fertilizer if desired, but keep rates low on new transplants. Rotate plantings in the garden every 2 or 3 years with unrelated plants to help prevent the buildup of pathogens in one area. This is extremely helpful in preventing *Fusarium* and *Rhizoctonia*. Remove crop residue at season's end to help reduce pathogen survival.

Even with these practices, root rot may still occur. Fungicides are available to help control the major groups of fungi discussed here. The fungicides protect plant stems and roots not yet affected but cannot magically revive dead plants. Fungicides are most useful in cases where a root rot is discovered in a flower bed

and the goal is to preserve remaining healthy plants to season's end. Affected plants are removed, and nearby plants treated with the appropriate fungicide. Many fungicides are specific to particular pathogens, so treatment relies on accurate diagnosis. Specific chemicals are listed by host crop in the *Illinois Commercial Landscape and Turfgrass Pest Management Handbook* or the *Home, Yard, and Garden Pest Guide*. Consult *Report on Plant Disease*, no. 615, "Damping-off and Root Rots of House Plants and Garden Flowers," for more details on root rots. This publication is available in Illinois extension offices or on the Internet at <http://www.ag.uiuc.edu/%7Eevista/horticult.htm>. (Nancy Pataky)

### Rhododendron Root Rot

Rhododendrons are famous for susceptibility to Phytophthora root rot. They are occasionally host to other root rot pathogens, including *Cylindrocladium*; but that is mostly in production areas. They also succumb to *Botryosphaeria* dieback, which can resemble Phytophthora root rot but forms distinct cankers at the base of wilted stems. *Botryosphaeria* follows drought stress, whereas *Phytophthora* occurs in wet periods.

Rhododendrons can be spectacular, even in Illinois. They require more planning and work here than in milder climates with loose, acidic soil. Prepare the planting site as recommended by Extension specialists or reputable nurseries. Planting in exposed, poorly drained, or clay sites with a high pH soil invariably leads to slow decline and/or *Phytophthora* infection.

*Phytophthora* root rot occurs on rhododendrons throughout Illinois. First symptoms include a dull green cast to the foliage, followed by wilting and lack of new growth. Roots of infected plants are reddish brown. Healthy roots should be white or should at least have white root tips. We usually see *Phytophthora* root rot in late May or June in Illinois. The fungus thrives in wet or poorly drained sites; so if you are in a wet area of the state, watch for symptoms of this disease.

You will not be able to save infected plants, but proper identification of the problem can help prevent spread to other rhododendrons. Because poorly drained soils allow disease development even in some resistant rhododendrons, proper soil preparation and good drainage are keys to disease control. Chemical drenches are available for commercial growers to help prevent disease spread. Carefully inspect any plant material that you purchase or move to your landscape.

Field work to develop rhododendrons with resistance to this disease has been ongoing for many years. At the Ohio State University, Drs. Hoitink and Schmitthenner performed trials on 336 hybrids (1974). Those most resistant were Caroline, Professor Hugo de Vries,

and Red Head. English Roseum was reported as moderately resistant. There were not a great many resistant choices. You can look for resistant hybrids in the nursery, but even with these plants we need to emphasize site and soil preparation. Equally important is the selection of a hybrid hardy in your area.

Phytophthora root rot kills roots, thereby inhibiting water and nutrient absorption. Any factor that similarly injures roots could produce similar symptoms. For more information, consult *Report on Plant Disease*, no. 664, "Phytophthora root rot or wilt of rhododendron and azaleas in the Midwest," available in Illinois Extension offices or on the Web at <http://www.ag.uiuc.edu/%7Evista/horticult.htm>. (Nancy Pataky)

## INSECTS

### Scouting Watch

**Gypsy moth** larvae are getting large enough in northeastern Illinois to cause noticeable feeding injury. Look for branches at the tops of oaks and other trees being stripped of foliage. *Bacillus thuringiensis kurstaki* (Dipel, Thuricide) should still be effective on smaller caterpillars, but spinosad (Conserve) or a pyrethroid may be needed to control larger larvae.

**Mimosa webworm** first generation should be noticeable in the southern half of Illinois and along the Lake Michigan shore. Other areas in northern Illinois where there has been previous damage should also be checked. Honey locust is attacked throughout the state, as well as mimosa in southern Illinois. Damage of this first generation appears as a few leaflets webbed together, with window-feeding damage on the leaflets. Separating these webbed leaflets reveals green to gray caterpillars up to one inch long. From a distance, damaged trees appear to have light or reflective spots in the foliage where feeding damage is occurring. Insecticides suggested for gypsy moth are effective, but coverage must be thorough to get the insecticides to the larvae. Treating now reduces the more damaging second generation in July.

**Flea beetles** continue to be reported damaging rose, evening primrose, hosta, and other flowers throughout Illinois. Tiny holes rapidly expand to large brownish areas. Carbaryl (Sevin) and labeled pyrethroids are effective against these insects. Be sure to avoid spraying blooms to avoid killing beneficial nectar and pollen-feeding insects.

**Ash flower gall** is being sent in to the Plant Clinic from several areas of the state. Eriophyid mites attack the male flower on ash, causing clusters of prickly, roundish, green galls up to 1/2 inch across, which appear somewhat like miniature sweet gum balls. These galls soon shrink and turn brown, with no harm to the tree; treatment is typically not warranted. (Phil Nixon)

### Bagworms

It is time to think about dealing with the notorious bagworms, *Thyridopteryx ephemeraeformis*, in southern and central Illinois. Young bagworm larvae have been found in Champaign-Urbana as of May 25, 2004. Newly hatched larvae or caterpillars are difficult to see because they blend in with plant foliage. The caterpillars climb to the tops of trees and dangle on 1- to 3-foot strands of silk. These strands are caught in the wind and detach, becoming streamers (this process is referred to as "ballooning") that keep the caterpillars aloft for hundreds of feet to many miles, depending on updrafts and wind speed. Bagworms float until the silk catches on an object or plant. It is important to note that caterpillars are likely to balloon in the spring from nearby or even distant trees. The young caterpillars are small and as such cause minimal damage initially to foliage. They feed on the epidermal and mesophyll layers, creating light areas on the leaves. Waiting to spray an insecticide for at least 2 weeks after egg hatch allows sufficient time for the caterpillars to complete their ballooning and settle down and feed. One application during this time provides a high level of control. A second application may be required a week or two later.

Female bagworms hanging on trees from last year can contain 500 to 1,000 eggs. Newly hatched caterpillars emerge from the bottom of the bags around June, depending on environmental conditions. Each forms a tiny silk bag or case covered with material from whatever host it is eating and resides in this bag for the rest of its life. The young caterpillars are 1/8 to 1/4 inch long and initially feed on the epidermal tissue on one side and mesophyll layer, causing leaves to appear whitish before turning brown. The young caterpillars start feeding at the top of trees and shrubs.

Older larvae are 3/4 to 1 inch long and consume entire needles or leaves, mainly stripping the branches at the top of the tree. As they age and the food source declines, the caterpillars and their damage progress down the plant canopy. Stripped conifer branches usually die. A severe bagworm infestation can completely defoliate plants, which may result in death of branches or the entire plants. This is especially the case for evergreens, which don't normally put out a flush of growth following defoliation by bagworms. Deciduous trees and shrubs that have been infested generally produce a new flush of leaves and survive. Bagworm caterpillars feed for about 3 months. On some plants, female bags are mainly found at the top, male bags on the bottom, which may make it easier for females to effectively disperse a pheromone to attract males.

In late summer, around mid-August, bagworms pupate inside the bags. It takes about 7 to 10 days for

bagworms to change from pupa to adult, depending on the temperature. The males, ugly black moths with clear wings, emerge through the bottom of the bag and fly off to mate with females. Females never develop into winged moths and lack eyes, wings, legs, and antennae; they remain inside the bag, producing eggs before dying. The eggs are the overwintering stage. There is one generation per year in Illinois.

Handpicking and destroying bags from fall through midspring is effective in removing the overwintering eggs before they hatch. Bags should be placed in a plastic container and disposed of.

Insecticides recommended for control of bagworms include *Bacillus thuringiensis* var. *kurstaki* (Dipel or Thuricide), cyfluthrin (Tempo), trichlorfon (Dylox), and spinosad (Conserve). Insecticide sprays are effective on the young caterpillars. Older ones, in which the bags are at least 3/4 inch long, are difficult to control; and females feed less as they prepare for reproduction. The bacterium *Bacillus thuringiensis* is effective on young caterpillars, but the material must be ingested—so thorough coverage of all plant parts is essential. Spinosad works by contact and ingestion and is very effective in controlling bagworms. Cyfluthrin and trichlorfon are recommended for larger caterpillars. Again, thorough coverage of all plant parts is essential, especially the tops of trees. As mentioned, insecticides should be applied about 2 weeks after hatching has initiated, to allow all bagworms to hatch and blow around, permitting the caterpillars to complete the ballooning process. Treating too early generally results in the need for a second application. It is best to wait

until mid-June in southern Illinois and late June to early July in central Illinois. Scouting trees and shrubs a week or two after application will be helpful in making sure that no more bagworms have blown in and in evaluating control efforts.

In addition to the recommended insecticides, research has shown that certain species of entomopathogenic nematodes (*Steinernema carpocapsae*) attack bagworms. When the nematodes are sprayed onto the bags, they infect the female bagworms inside. The bags provide a humid environment conducive to nematode activity. It is important to apply the nematodes before females lay eggs. A sex pheromone, used in traps to lure male moths, may be used to interfere with mating behavior and reduce fertilization; unfertilized eggs do not hatch. (Raymond A. Cloyd)

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*Home, Yard, and Garden Pest Newsletter* is prepared by Extension specialists from the University of Illinois at Urbana-Champaign and the Illinois Natural History Survey. Information for this newsletter is gathered with the help of staff members, Extension field staff, and others. Karel Jacobs and Donna Danielson of The Morton Arboretum also provide information and articles.

Major authors are Phil Nixon, (217)333-6650, Fredric Miller, (708) 352-0109, and Raymond Cloyd, (217)244-7218, entomologists; Nancy Pataky, (217)333-0519, plant pathologist; Bruce Paulsrud, (217)244-9646, pesticide applicator training; and Tom Voigt and David Williams, (217) 333-0350, and Michelle Weisbrook, (217)244-4397, horticulturists. Phil Nixon is the executive editor of the *Home, Yard, and Garden Pest Newsletter*. This newsletter is written by faculty in the Department of Natural Resources and Environmental Sciences and the Department of Crop Sciences. It is edited by Mary Overmier and typeset by Virginia Cuppernell, Information Technology and Communication Services.

For subscription information, phone (217)333-2666 or (800)345-6087, or e-mail [acesnews@uiuc.edu](mailto:acesnews@uiuc.edu). Web subscriptions are available (<http://www.ag.uiuc.edu/cespubs/hyg>).

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