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. 10 • June 22, 2005

PLANT DISEASES

Elm Disease Concerns

Dutch elm disease is the first problem I consider when I think about elm in the lab. We still see plenty of it in Illinois, and it kills trees. That disease was discussed in issue 6 of this newsletter.

There are other elm disease problems in Illinois, some serious and some minor. We are seeing black spot disease now. This **fungal leaf spot** causes black leaf spots that range from pin-head size to about ¼-inch in diameter. The foliage around the spots turns yellow, and leaves may drop prematurely. Most elm species show little growth effect from black spot infection. There are some other leaf-spotting fungi on elm, including *Phyllosticta, Coniothryium, Cercospora,* and *Gloeosporium*. All appear similar. If you feel the need to manage these leaf spotters, rake and remove leaves at the end of the season, remove dead wood in the tree, water small trees in drought stress, and fertilize in the fall or spring. The diseases occur when conditions are cool and wet as leaves emerge. Some elms have more resistance than others but heritability varies even within the species.

Elms, like most deciduous trees, are also susceptible to fungal **cankers**. I can list a few you may recognize, such as *Botryosphaeria, Phomopsis,* and *Nectria*. Still, these fungi invade only when the tree is under stress. You don't need to know the exact fungus causing the canker. Instead, you need to recognize what is stressing tree growth. As with most tree canker problems, identify and correct the stress, remove dead or badly cankered wood where possible, water in periods of drought, and practice sound horticultural practices.

Wetwood and slime flux are common on elm. That disease complex was discussed in issue 4 of this newsletter. There is no control for wetwood, but it is not fatal to a tree. The bacteria associated with the infection are common in our soil and probably infect from the soil. Most old elms in the state are infected with wetwood.

Elm yellows disease (aka phloem necrosis) is as serious as Dutch elm disease. The disease will kill mature elms. Symptoms of elm yellows, which may appear any time during the summer but are most common in mid- to late summer, include yellowing and drooping of foliage followed by leaf drop and death of branches. This pattern may occur on one or a few branches or may quickly involve the entire tree. Susceptible trees may show symptoms over the entire tree in a matter of a few weeks. Tolerant trees become stunted and may develop bunchy, prolific growth at the tips of branches or on the trunk. The inner bark tissues of infected trees often exhibit a butterscotch or light brown discoloration in small streaks or flecks. Although trees infected with the Dutch elm disease fungus usually show vascular discoloration in symptomatic branches, the discoloration from elm yellows is more commonly found in the trunk. A simple field test to help with diagnosis involves taking a few chips of the stained phloem tissue, placing it in a closed container for a few minutes, and then checking for a wintergreen odor.

Elm yellows disease is caused by a phytoplasma, an organism that cannot be isolated on agar in a lab. We cannot test for this phytoplasma at the Plant Clinic and must rely on symptoms for diagnosis. Confirmation usually involves extraction of DNA from a diseased plant, amplification of a DNA fragment by polymerase chain reaction (PCR), and identification of the fragment. Such procedures are available but only at a high cost due to labor and equipment needs. Some specialty labs, such as AGDIA (http://www.agdia.com), offer the service. Generally, diagnosis is based on symptoms in the field and elimination of Dutch elm disease as a possibility. For this reason, no confirmed cases of elm yellows have been reported by the University of Illinois Plant Clinic, but confirmation has come from several knowledgable tree specialists in the state. For additional information, consult Report on Plant Diseases No. 660, *Elm Yellows or Phloem Necrosis and Its Control,* or the book *Diseases of Trees and Shrubs* by Sinclair, Lyon, and Johnson. The disease report can be found on the web at http://www.ag.uiuc.edu/%7Evista/horticul.htm or in Illinois Extension offices. (*Nancy Pataky*)

Rose Fungicide Ratings

If you care for roses, more than likely you've battled the fungal disease called black spot. There are many fungicides labeled for rose diseases in both the home and commercial markets. In contrast to other woody ornamental plants, we are fortunate that results of many rose fungicide research trials have been published over the past five years or so. What do these trials reveal about the efficacy of the fungicides on the market today? Quite a bit, actually! Refer to Table 1 for details.

The ratings in Table 1 are based on 16 unique research trial reports published in the American Phytopathological Society's Fungicide and Nematicide Tests (http://www.plantmanagementnetwork.org/pub/trial/fntests). These trials were conducted by various researchers from around the United States. Thus, your results may vary based on application dose, timing, frequency and coverage, environmental conditions, and local pathogen population.

The following publications provide detailed information about the diseases and fungicides mentioned in Table 1:

- Black spot of rose—see *Report on Plant Disease #610* (http://web.aces.uiuc.edu/vista/pdf_pubs/610.pdf)
- Powdery mildew of roses—see *Report on Plant Disease #611* (http://web.aces.uiuc.edu/vista/pdf_pubs/611.pdf)
- Rose rust—see *Report on Plant Disease #630* (http://web.aces.uiuc.edu/vista/pdf_pubs/630.pdf)
- Downy mildew of rose—see Oregon State's fact sheet (http://plant-disease.ippc.orst.edu/disease.cfm?RecordID=985)
- *2005 Commercial Landscape and Turfgrass Pest Management Handbook* (available for purchase through your local University of Illinois Extension office or at http://www.PublicationsPlus.uiuc.edu)
- *2004 Home, Yard & Garden Pest Guide* (available for purchase through your local University of Illinois Extension office or at http://www.PublicationsPlus.uiuc.edu)

(*Bruce E. Paulsrud*)

Table 1. Efficacy of Fungicide Active Ingredients Against Various Rose Diseases

	Rose diseases and their occurrence in Illinois			
Active Ingredient	**Black spot 1[a]**	**Powdery mildew 2-3**	**Rust 4**	**Downy mildew 5**
azoxystrobin	X (++++)*	X	X	X
captan	X			X
chlorothalonil	X (++++)	X	(-)*	
copper	X	X		
copper sulfate	X (++++)*	X		
fenarimol		X		
Fungus Fighter Tonic[b]	(-)*	(++++)*		
iprodione	X			
kresoxim-methyl	X	X	X	X
lime-sulfur	X	X	X	
mancozeb	X		X	X (++++)*
myclobutanil	X (++++)	X (++++)	X (++++)*	
neem oil	X (+)			
phosphorus acid	(++)			X (++++)
potassium bicarbonate	X (-)*	X		
propiconazole	X (+++)	X	X	
sulfur	X (+++)*	X	X (-)*	
SunSpray UF oil	(variable)[c]	X (++)*		
tebuconazole	X (variable)[c]	X	X	
thiophanate-methyl	X (+++)*	X	X (-)*	
triadimefon		X		
trifloxystrobin	X (+++)	X	X	X (+++)*
triforine	X (+++)	X	X (++++)*	

[a]Occurrence ratings: 1 = annual, 5 = rare.

[b]Jerry Baker's "Fungus Fighter Tonic" (1 cup powdered milk, 1 cup molasses, 1 tsp baking soda per gallon of water).

[c]SunSpray Ultra-Fine Oil had an effect against black spot but was highly variable in the two trials reviewed. Tebuconazole was included in several trials as a foliar application and drench, but given the sometimes contradictory results between trials and the considerable variation in formulations used in the study vs. what is available on the market, it is not appropriate to make an efficacy determination at this time.

*Rating is based on one trial; all others are based on two or more trials.

X = At least one formulation of this active ingredient is labeled for this use.

- = not effective (less then 10% disease reduction compared to untreated plants).

+ = marginally effective (10-24% disease reduction).

++ = moderately effective (25-49% disease reduction).

+++ = effective (50-74% disease reduction).

++++ = very effective (75% disease reduction or greater).

INSECTS

Japanese Beetle

Japanese beetle has arrived in central and southern Illinois. Beetles were reported from Assumption on June 15 and were found in the Clinton and Urbana areas on June 16. We normally do not expect to see Japanese beetle adults until the last week of June in central Illinois. Their emergence 10 to 14 days ahead of schedule is similar to the early emergences of other insects this year. We anticipate a heavy emergence of beetles this year, primarily because the weather has been appropriate for their development and survival. Factors that reduce beetle numbers are hot, dry soils in the fall and deep freezing into the soil during the winter. Neither of these occurred in the past year. The lack of rainfall, at least in central Illinois, during May would have had little effect on Japanese beetles because they would have been in the pupal stage for most of the month.

Adult Japanese beetles are 3/8- to 1/2-inch long. They are metallic green with coppery wing covers. They feed heavily on linden, birch, crabapple, rose, grape, brambles, willow, buckeye, and many other trees and shrubs. They are sun-loving beetles, feeding primarily on the upper surface of the leaves at the top of the tree or shrub. For that reason, damage tends to occur first at the top of the plant and works its way down. They eat through the upper leaf surface and interior mesophyll tissue, leaving the lower epidermis to dry and turn brown. They also eat holes through the leaves as well as consuming entire leaves.

These beetles fly to new hosts about every 3 days, typically flying 1 to almost 3 miles. For this reason, control of adult beetles has little effect on the amount of injury by Japanese beetle white grubs to nearby turf. Because beetles flying to new hosts are attracted to plants that have been fed upon previously, treatment or hand-picking when the beetles first appear helps reduce later damage. When disturbed, the beetles fold their legs and drop from the foliage. Holding a jar containing rubbing alcohol or soapy water under the beetles and then poking at the beetles once they are in the jar causes them to drop into the liquid and be killed.

Although beetles can be found into early October, their numbers remain high enough to cause significant feeding damage for about 6 weeks. Japanese beetles can be controlled with foliar applications of carbaryl (Sevin) or cyfluthrin (Tempo). Each insecticide typically provides control for 10 days to 2 weeks, so at least three applications will be needed to protect plants from severe feeding damage. Neem or azadiractin is repellent to the beetles, but it appears to perform better when applied before the beetles become numerous. Repeated applications are needed. Limited research with Japanese beetle traps has shown increased damage on plants in trapped areas. Although many beetles are trapped, it appears that the traps attract many beetles from a distance that then feed on nearby plants rather than flying into the trap. (*Phil Nixon*)

Masked Chafers

Annual white grub adults, also known as masked chafers (*Cyclocephala*), were observed in high numbers in Little Rock, Arkansas, on June 9. Assuming progression of emergence as one moves north, these insects should become numerous in southern Illinois during the week of June 20, which is about 10 days earlier than normal for that part of the state. Based on the flight of these beetles and Japanese beetle, along with weather patterns, decisions on white grub insecticide applications to turf can soon be made. The dry weather over most of the state combined with weather conditions last fall and winter means that white grub numbers are likely to be high. As we continue to see the size of masked chafer and Japanese beetle emergences, we will then make our recommendations for control. (*Phil Nixon*)

Woolly Birch Aphid

Woolly aphids are being found on river birch in northern Illinois. Although there is no accepted common name for *Hamamelistes spinosus,* it could be called the spiny witch-hazel gall aphid or woolly birch aphid for its appearance on the hosts that it attacks.

On birch, this insect overwinters on the bark as a hibernating female, sometimes called a “pupa.” In the spring at birch bud break, the female moves to the leaves, where it gives birth to young on the leaf undersides. The feeding of these young aphids causes corrugations, elongate wide ridges between the major veins on the upper sides of the leaves. These form troughs on the underside that are soon filled with whitish, fuzzy aphids. Heavily affected leaves are curled and twisted, and some will turn brown. As the aphids become adults, they fly to witch-hazel to lay eggs on the twigs by the end of June.

On witch-hazel, eggs overwinter on the twigs, hatching in the spring into stem mothers. Feeding by the stem mother aphid on the buds causes the witch-hazel to form a gall around the aphid. This green to reddish, spiny gall is about 3/4-inch long and hollow. The stem mother produces many reddish aphids inside the gall that then escape through an exit hole at the base and fly to birch.

The galls on witch-hazel do not damage the plant enough to warrant treatment. On birch, the aphids tend to attack just a few leaves on a branch or two that can be pruned off without the use of insecticides. They

can be controlled on heavily attacked birches with acephate (Orthene), imidaloprid (Merit), or insecticidal soap. (*Phil Nixon*)

Woolly Beech Aphid

Beech, *Fagus* spp., is one of the most beautiful specimen trees that is less susceptible to insect and mite pests compared to other trees. However, there is one insect, the woolly beach aphid, *Phyllaphis fagi*, that may be a problem when populations are excessive. This aphid has only a single host—beech. The woolly beech aphid gets its name because the body is covered with waxy wool-like filaments. These aphids are gregarious and tend to congregate primarily on the undersides of leaves. Often large numbers of the molting or cast "skins" will be attached to leaf hairs, which gives the leaf a whitish appearance. The woolly beech aphid has piercing-sucking mouthparts, which are used to remove plant fluids. However, woolly beech aphid is not considered an economic pest because beech trees, especially large specimen types, can sustain large populations without suffering any injury. Large populations of woolly beech aphid can, however, produce tremendous amounts of honeydew, a clear, sticky liquid that may attract wasps, ants, or yellowjackets. In addition, the honeydew serves as an excellent growing medium for black sooty mold fungi. Black sooty mold fungi can detract from the aesthetic appearance of a beech tree and most importantly can reduce the production of food via photosynthesis by blocking the entry of light.

For large beech trees, control is typically not warranted. A hard spray of water will dislodge aphids from the tree without harming any natural enemies. Insecticides that will provide control include acephate (Orthene), imidacloprid (Merit), and insecticidal soap. (*Raymond A. Cloyd*)

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.

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