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PLANT DISEASES

Honeylocust Knot Again

We do not see this disease often in Illinois. In fact, I can only recall three cases at the Plant Clinic. The problem could prove to be more common, however, if allowed to spread nationally in the nursery industry.

Honeylocust knot gets its name from the galls that form at branch or twig nodes, and sometimes between nodes. These galls are reported as 1/2 to 2 inches in diameter. On young twigs and in early stages, the galls start as two swellings at the node. Galls may girdle stems and cause death of tissue beyond the galls. Some nurseries have reported eventual decline and death of entire, infected trees. Pruning out the galls often results in spread of the problem.

We do not know a great deal about this "disease." The cause has not been identified. The disease is thought to be caused by a bacterium, but isolations and Koch's postulates have not been successful for many reasons. Here is a brief synopsis of what we do know. Pierluigi Bonello and Maria Bellizzi, of the Ohio State University Department of Plant Pathology, reported honeylocust knot in 2000 from the Cincinnati, Ohio, area, as well as from a nursery in Michigan. In both cases, tree symptoms appeared again in 2001 and eventually led to tree mortality. The disease appeared in rows in the nursery and there was some thought that it might have been spread by hand pruning. By 2002, these researchers had reports of similar symptoms on honeylocust trees in Ohio, Illinois, Iowa, Kentucky, Maryland, and Michigan. The University of Illinois Plant Clinic has seen symptoms of honeylocust knot on trees in Cook County (2004) and Will County (2006).

Researchers Bonello and Bellizzi put together a research report on this disease in 2002. You can view some images of the symptoms of the disease by visiting this site and clicking on the forward button to move through the sections of the report: http://ohioline.osu.edu/sc189/sc189_53.html. In 2005, Michigan department of agriculture inspectors found honeylocust knot on nursery trees shipped from Minnesota. Those trees were destroyed.

We had not heard of any further work on this problem for the last few years. Recently, however, we learned that an assistant professor and graduate student in plant aathology at the Ohio State University are beginning a new project involving this problem. We will keep you posted on any new developments. *(Nancy Pataky)*

White Pine Stress

Most of the plant problems we have seen lately at the Plant Clinic involve noninfectious causes. Although the cool, wet conditions this spring have slowed growth temporarily, the real problem occurred last year. Heat and water stress of last summer will be manifested in poor tree growth this year. Root injury that occurred last summer will show as top dieback, decline, and stunted growth in many species. White pines are often indicator trees of soil stress. They often show symptoms before other species. We are seeing that again this spring on white pines.

"White pine decline" is a name used to identify a complex of stress factors resulting in poor growth and/or slow decline of white pines. Other pine species are not affected to the same extent. White pine problems seem to be present throughout the state, especially in central and southern areas where conditions do not favor this species. Symptoms vary but generally include some pattern of needle yellowing or browning, small needle size, stunted growth, sparse foliage, shriveled bark on branches or trunk, sap exudate on branches, and in some cases death of the tree. Affected trees have ranged in size from 2 feet to more than 20 feet, indicating that trees of any size could be affected.

White pines thrive in the cool, moist, well-drained soils of Wisconsin forests as understory trees. Many of the problem trees we have seen in Illinois have been situated on clay sites or exposed to the elements (planted in new housing developments or used as windbreaks). It is likely that site stress has contributed to the decline of these trees. Both flooding and drought can add to the problem, causing additional root injury. Many times, we see one or two trees in a windbreak that are affected. Possibly crowding and competition are factors in those cases. Sometimes, trees recover.

Of the many white pines examined over the years at the Plant Clinic, the common factor seems to be root decline. Few live, fibrous, white roots have been found on white pines in decline; and in most cases fungal pathogens have not been found. Roots may be in decline for many reasons. Some factors contributing to white pine decline include clay or poorly drained soil, compaction, heat stress to roots, drought, flooding, deep planting, girdling roots, and sudden extremes in temperature and moisture. Pines prefer acidic soil, so the alkaline soils in Illinois landscapes (and alkaline irrigation water) may also be part of this complex. In a few cases, oozing sap near the soil line has been associated with Procerum root rot, a root decline caused by a weak pathogen known to invade stressed trees.

Often trees with white pine decline do not recover. Because there is nothing infectious in these trees, waiting to see if the trees recovers will not jeopardize the health of nearby white pines. Entomologists point out that if bark beetles invade the declining tree, you should remove the tree to avoid a bark beetle problem on nearby pines. Watering helps (except in cases of flooding stress), as does the use of natural mulch (such as shredded bark) over the root system. Still, without adequate root mass, plants are not able to use the available water quickly enough to replace what is used by the foliage. The result is sudden browning or off-color needles and death of branches. *(Nancy Pataky)*

Hosta Virus X Testing

Many gardeners now use hostas for color, texture, and design interest in shade gardens. In recent years, several viruses have become evident on this previously disease-free genus of plants. If you are buying new plants, moving hostas, sharing them with your friends, or on the receiving end, read this article first.

Several hosta viruses have been reported in scientific literature in the past decade. These include hosta virus X (HVX), tomato ringspot virus, impatiens necrotic spot virus, and arabis mosaic virus. Hosta virus symptoms may be subtle or they may be obvious. The most common symptom is mottling of the leaves; but stunting, twisting, ring spots, and puckering may appear. There are many hosta cultivars on the market, and some have odd coloring, odd leaf form, and even some leaf puckering. Be familiar with the cultivar you are purchasing so that you can recognize abnormal symptoms. Plants do not have immune systems, so a virus stays with a plant for life. There are no chemicals that can be applied to rid the plant of the virus. If the hosta is very susceptible, it dies from the virus infection. More resistant plants may be mildly stunted or show symptoms without a growth response.

Agdia, Inc., a private lab in Indiana offers virus testing. You can visit them at www.agdia.com. Here is a Missouri Botanic Garden Web site with more pictures of hosta virus X–infected plants: http://www.mobot.org/gardeninghelp/plantfinder/IPM.asp?code=182&group=67&level=s

Viruses cannot be cultured in a lab. They cannot be viewed with a compound microscope. Confirmation of a specific virus involves serological tests, usually ELISA, each for a specific virus. Tests are ordered based on symptoms. Crop screens can be done for groups of viruses at once. For example, Agdia has a tomato screen that tests for 17 viruses at once. The cost is considerably higher than testing for one virus, but it is more economical than ordering 17 individual tests.

The University of Illinois Plant Clinic can test for a limited number of viruses. On hosta, we have the ability to test for hosta virus X and for impatiens necrotic spot virus. Samples submitted for virus testing must contain live, fresh foliage. It is best to call before sending a sample for virus testing, (217)333-0519. We want to be sure we have the testing materials and that you send us the correct sample.

Meanwhile, know the qualities of the hosta cultivars you are planting, don't try to save weak or odd-looking plants; and isolate suspect plants until they can be tested for virus. Because many viruses are spread in plant sap, always use good sanitation when moving between cultivars. *(Nancy Pataky)*

INSECTS

Scouting Watch

Bridal wreath spirea, or Vanhoutte spirea *(Spiraea x vanhouttei),* is blooming in northern Illinois, and professional horticulturists should be watchful for the following being susceptible to control activities. **Full bloom:** Birch leafminer young larvae; elm leaf beetle young larvae; European pine sawfly feeding larvae; gypsy moth feeding larvae; pine needle scale crawlers (first generation), black turfgrass ataenius (first generation). **Full to late bloom:** Lilac (ash) borer newly hatched larvae; oystershell scale (brown) crawlers. **Finishing bloom:** Bronze birch borer newly hatched larvae. **Most blossoms brown, still a few white:** Flatheaded appletree borer larval hatch; peachtree borer newly hatched larvae; viburnum borer newly hatched larvae. **Bloom finished:** Oystershell scale (gray) crawlers.

Euonymus scale is in the newly hatch nymphal or crawler stage in central and southern Illlinois. These crawlers are lemon yellow and easy to spot on the foliage. Most contact insecticides are effective, including

insecticidal soap, summer spray oil, acephate (Orthene), bifenthrin (Onyx, Talstar), and cyfluthrin (Tempo). Be sure to get thorough coverage to achieve a high level of control. *(Phil Nixon)*

Borers Susceptible to Control

Several borers are susceptible to control in central and southern Illinois at this time. Timely application of insecticide is needed to provide borer control because most are difficult to control once they burrow into the tree.

Bronze birch borer, flatheaded appletree borer, and **roundheaded appletree borer** are susceptible to an application of imidacloprid (Merit) to the trunk and major branches. Bronze birch borer and flatheaded appletree borer are also susceptible to soil or trunk injections of imidacloprid.

Lilac borer, ash borer, peachtree borer, and **viburnum crown borer** are susceptible to an application of permethrin (Astro) to the trunk and major branches. Lilac borer and ash borer are the same insect, *Podosesia syringae.* Because permethrin is not systemic, it is effective only when sprayed on the bark surface to control the egg-laying adults and the hatching larvae before they penetrate the tree.

Lilac borer, ash borer, peachtree borer, and viburnum crown borer are all moths as adults; their larvae are caterpillars. Imidacloprid provides very limited control against caterpillars, making permethrin the insecticide of choice. Bronze birch borer, flatheaded appletree borer, and roundheaded appletree borer are all beetles as adults. Although they are controlled by permethrin, imidacloprid tends to be longer-lasting on the trunk of the tree. This effect is useful because adult beetles tend to live longer than moths. In addition, imidacloprid penetrates the bark, particularly that of younger trees or thinner-barked trees, providing additional control of newly hatched larvae under the bark. *(Phil Nixon)*

Emamectin Benzoate Approved for EAB

Illinoisans will now have an effective alternative to tree removal in their arsenal against the emerald ash borer (EAB), a deadly wood-boring beetle that has plagued Illinois and North America long before its initial discovery in 2002.

The Illinois Department of Agriculture on April 15 approved a special local need request for the use of Tree-age™, an insecticide touted as the most effective chemical weapon against EAB. Nearing 100 percent effectiveness, the product, developed by Swiss agrochemical company Syngenta and Massachusetts firm Arborjet, has an active ingredient called emamectin benzoate that is injected directly into the ash tree's vascular system where EAB larvae feast. The direct injection affects only the beetle larvae and does not harm anything coming into contact with the tree, such as butterflies, birds and squirrels.

After yearlong preliminary studies, Michigan (and most recently, Indiana) officials have approved the chemical. Based on results in Michigan, preliminary evidence suggests that a single treatment could provide up to 2 years of control.

Ideally intended as a preventive treatment for healthy, non-EAB-infested trees, Tree-age™ is most suitable for trees in close proximity to EAB-infested areas.

"IDA encourages property owners to consult with a certified arborist or tree-care company to discuss treatment pricing and other options suitable for their situation," says Warren Goetsch, bureau chief of Environmental Programs. "Cost will be a factor for most homeowners. This tool will most likely be used by golf courses and other landscape areas where entire canopies will be devastated, affecting local commerce." *(Phil Nixon, adapted from Illinois Department of Aggriculure news release.)*

Black Turfgrass Ataenius

Black turfgrass ataenius is a turf-attacking grub that overwinters as adult beetles in debris in low-lying areas. On golf courses, this habitat is commonly provided by tree plantings between fairways. Because the fairways are elevated to provide drainage, the runoff water tends to accumulate between fairways. Trees are typically planted between fairways to provide visual screening from golfers on adjacent fairways and to deflect balls. Fallen tree leaves are frequently allowed to remain in these areas or in nearby natural areas, providing excellent overwintering locations for the beetles.

The black turfgrass ataenius adult beetles fly in the spring to the most heavily irrigated portions of the golf course, primarily the greens, tees, and low-lying areas of fairways. They are about 1/4 inch long, shiny black, cylindrical beetles and are noticeable in the clippings baskets of greens mowers. Eggs hatch about 2 weeks after the beetles migrate to turf areas, which is when insecticidal control should be applied. This is typically when bridalwreath spirea, vanhoutte spirea, is in full bloom.

The resulting larvae are white grubs that appear similar to other turf-feeding white grubs except that they stay small, with fully grown grubs being only about 1/4 inch long. They also appear to be more slender than other white grubs. They have no raster pattern, arrangement of heavy hairs or light spines, on the underside of the end of the abdomen. Instead, they have two large pads in that area.

Feeding by the first generation continues through the spring, with pupation occurring in late June to early

July. A second generation of beetles emerges shortly thereafter to lay eggs for a second generation of larvae. These larvae feed through the late summer into early fall and then pupate. Adults emerge from these pupae in the fall and fly to damp leaf litter to overwinter.

Damage is most likely to occur in the wettest areas of the golf course, where the adults are attracted. Greens, tees, and swales in fairways are likey to have wilted, brownish turf that can easily be pulled up. The small, black turfgrass ataenius grubs are located in the root zone and are easily seen when the turf is pulled back. If scouting for ataenius grubs, 50 or more grubs per foot square are enough to cause damage.

Keep an eye on the clippings baskets of greens mowers to determine when the adult beetles fly onto the course and to determine, in relative terms, the size of the population. Mark the date when the beetles were numerous and apply imidacloprid (Merit) or halofenozide (Mach 2) about 2 weeks later, which should be when vanhoutte spirea is in full bloom. This is occurring in southern and will soon occur in central Illinois. Treatment should occur in late May in northern Illinois. If beetle numbers were small, scout for the grubs late in vanhoutte spirea bloom by cutting through the turf and pulling it back. In irrigated turf, the grubs should be in the upper root zone.

Imidacloprid and halofenozide are persistent enough that this spring application will control not only first-generation black turfgrass ataenius but also second-generation black turfgrass ataenius, Japanese beetle, and masked chafer grubs in August. About 15 percent of the time, control will not be achieved in August, so scout for grubs at that time. If damaging numbers of grubs are found, apply trichlorfon (Dylox) as a rescue treatment. Trichlorfon is also recommended as a rescue treatment if damaging numbers of first-generation black turfgrass ataenius grubs are found in June. *(Phil Nixon)*

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