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Last Biweekly Issue for 2005

This is the last biweekly issue of the *Home, Yard, and Garden Pest Newsletter* for 2005. Only two issues remain for this year, one in October and another in November. Each will be published during the third week of the month. *(Phil Nixon)*

PLANT DISEASES

Hosta Virus X Summary

This virus name is the topic of discussion and concern in many hosta-growing groups. An article in May of this year, by Mike Bryan of the Michigan Department of Agriculture, reported their inspectors found hosta virus X in record-high numbers in sales lots. We have received several inquiries at the Plant Clinic, asking what symptoms to watch for, how to positively identify the virus, and how to control the disease.

Plant viruses are grouped according to physical features, including presence of either DNA or RNA, number of nucleic acid strains, type of replication, and other features such as particle shape. Hosta virus X is categorized as a potexvirus. The symptoms of hosta virus X vary with the hosta cultivar, making it difficult to identify by symptoms alone in the field. Symptoms may include severe mosaic, chlorotic spotting, interveinal chlorosis, deformed growth, stunting, and necrotic tissue as leaves dry out. Color breaking may occur in flowers. A recent positive hosta virus X sample at the U of I Plant Clinic (confirmed by AGDIA ELISA) exhibited leaves that were thickened, slightly distorted, showing severe mosaic and some light spotting. Hosta virus X symptoms may be mild or severe, depending on the cultivar. Therefore, a plant could be infected but free of symptoms, thereby serving as a source of virus in the planting. In reports by Currier and Lockhart (researchers in Minnesota), systemic symptoms did not occur on new leaves for 4 to 5 weeks after inoculation.

There are other virus diseases reported on hosta, including tomato ringspot, impatiens necrotic spot, and arabis mosaic virus. Symptoms of many viruses are similar, and the specific disease cannot always be discerned by symptoms alone. Virus particles cannot be seen with a compound microscope nor cultured in a lab. Sometimes virus particles can be seen with an electron microscope used to observe infected plant sap. Positive identification can be attained by ELISA (enzyme linked immunosorbant assay) testing. Although ELISA tests can be done by many labs, the test requires having specific antibodies for each virus tested. When a hosta virus suspect is sent to a lab, specific virus tests or a screen can be requested. Screens include all the more common viruses for which antibodies are available. Screens are more expensive because they involve multiple tests done at once.

As hostas have grown in popularity, so have their reproduction and sales. Virus diseases such as hosta virus X can be spread mechanically through infected sap, so vegetative reproduction is an easy means of transmitting the virus. The virus is known to spread by vegetative propagation and infected sap, but there is no known insect vector. With more money in the hosta business, additional resources will be used on hosta virus research.

How do we manage this disease? First, do not purchase hosta cultivars that appear out of character for the cultivar. Do not propagate or share such oddities. Any virus-infected plants in the planting should be removed and destroyed. If you are splitting hostas or otherwise trimming plants, keep in mind that you could be transmitting a virus. Disinfect cutting tools between plants. Become familiar with hosta virus symptoms. Images of hosta virus X can be found at the Michigan State site, http://www.ipm.msu.edu/CAT05_land/L05-13-05hosta.htm, and the AGDIA site, http://www.agdia.com/cgi_bin/slideshow.cgi. You can also find more information on the Internet by searching under hosta virus X. *(Nancy Pataky)*

Oak Wilt 2005

Oak wilt is a fatal disease of oaks. The fungal pathogen is capable of killing oaks in the red oak group in one growing season. Oaks in the white

oak group are also susceptible, but decline and death are slower, sometimes prolonged over many years. No oak species grown in Illinois is immune to the fungus. Details about oak wilt are in issue no. 8 of this newsletter or in *Report on Plant Disease*, no. 618, "Oak Wilt and its Control," from Illinois Extension offices or on the Web at www.ag.uiuc.edu/%7Evista/horticul.htm.

Many fear that oak wilt will spread throughout Illinois oaks much as Dutch elm disease killed elms in the early 50s. This is very unlikely because the oak wilt fungus cannot spread quickly over great distances. It is spread from tree to tree by underground root grafts or aboveground by way of beetles that feed on fungal mats. The fungal mats do not appear on all oak species. Also, the fungal mats are only exposed to insect feeding after the bark begins to fall from the tree, exposing the mats. As long as we are able to remove dead oaks in a timely manner, aboveground spread will be reduced.

Plant Clinic Oak Wilt Assays

	Samples		
Year	Total	Negative	Positive
1999	80	8	72
2000	69	11	5
2001	52	10	42
2002	97	26	71
2003	78	16	62
2004	81	14	67
2005	56	12	44

The table shows the number of oak wilt samples cultured at the University of Illinois Plant Clinic in the last 7 years. The positive diagnosis can be made only when the oak wilt fungus is isolated from the sample. The Plant Clinic handles only oak samples submitted by clients, so these samples cannot be considered a survey of what is appearing in the state. Still, these numbers do not show in increase in oak wilt isolations over the last 7 years. *(Nancy Pataky)*

Bacterial Leaf Scorch Progress

Many gardeners are all too familiar with environmental leaf scorch. Environmental stress, root injury, drought, and many other factors may cause leaf margin necrosis, a condition we call scorch. The extended periods of drought in 2005 have caused leaf scorch to be rather common. Environmental scorch is usually widespread in a tree and is fairly uniform, although it may appear more severe on the more exposed sides of the plant. Environmental leaf scorch does not necessarily return each year. It is not caused by an infectious agent. Bacterial leaf scorch (BLS) is an infectious disease caused by a bacterium that spreads systemically and causes a slow decline and death of the tree. This disease is not new but is beginning to appear more frequently in the Midwest. Details can be found in issues no. 13 and 16 of this newsletter.

BLS is caused by the bacterium *Xylella fastidiosa*, which is fastidious, or limited, to the xylem of the plant. It cannot be isolated by conventional lab techniques and is not observed in simple tests for bacterial exudates. To identify this pathogen, fresh leaf and petiole tissue is macerated and extracted sap used to do an ELISA (enzyme linked immunosorbant assay) test. The Plant Clinic had 12 BLS suspect samples in 2005. Eleven oaks and one maple sample were tested for BLS. Three of the oaks tested positive. These samples were from oaks in Champaign, Vermilion, and St. Clair counties. Over the last 5 years, samples submitted through the Plant Clinic have yielded 28 positive cases of bacterial leaf scorch, as indicated in the following table.

Plant Clinic BLS Assays

	Positive samples, by year				
	01	02	03	04	05
Pin oak	6	4	4	1	1
Shingle oak	1	-	-	-	-
Bur oak	-	1	-	-	-
Red oak	-	-	1	1	1
White oak	-	-	1	-	-
Unknown sp.	-	-	-	5	1

I have watched symptom development on three oaks in Champaign that tested positive for BLS. These oaks showed symptoms in July this year and have rapidly progressed to mostly brown leaves by mid-September. Surrounding oaks are still green. It is not difficult to see trees potentially infected with BLS. Make note of them in your area. If BLS is present, the trees can be expected to leaf out normally next spring. Scorch symptoms will appear in mid- to late summer and be more intense than this year. August is the perfect time to sample these suspect trees, as detailed in issue no. 13 of this newsletter. Know the symptoms of this disease. An excellent resource on BLS can be found on the U.S. Department of Agriculture Web site, www.usna.usda.gov/Research/BacterialLeafScorch.html. *(Nancy Pataky)*

INSECTS

Magnolia Scale

Just when you thought you didn't have any insect pests to worry about, it is now time to deal with the crawler stages of magnolia scale, *Neolecanium cornuparvum*, which are actively moving about before they settle down to feed on twigs. Crawlers are primarily located on the undersides of 1- to 2-year-old twig growth. They eventually produce a powdery, waxy, white covering over their bodies. Magnolia scale overwinters as a first-instar crawler, with only one generation per year in Illinois.

Magnolia scale females are ½-inch long and red–brown in color. They are initially covered with a white, waxy powder. During August and September, depending on the temperature, females deposit eggs, which hatch into crawlers that are gray to red in color. The crawler stage is most susceptible to insecticide applications. Insecticides recommended include acephate (Orthene), insecticidal soap, and horticultural (= summer) oil. All plant parts must be thoroughly covered with the spray.

Although insecticides are effective against magnolia scale—particularly the crawlers—the primary way to minimize problems is by promoting plant health through proper watering, fertility, mulching, and pruning practices. This may decrease susceptibility or limit the amount of injury when plants are infested with low to moderate populations of magnolia scale.

Several natural enemies, such as ladybird beetles, feed on magnolia scales; however, they are usually not abundant enough to provide adequate control. *(Raymond A. Cloyd)*

White Grubs

Reports of white grubs this fall have been few and far between. Expect damage to continue into the fall, most likely in small, "hot spot" areas consisting of portions of lawns or of a few lawns in a neighborhood. Nonirrigated lawns are unlikely to have many white grubs for two reasons: (1) Their dormant grass in July would have been less attractive to the beetles for egg-laying. (2) Insufficient rainfall has probably occurred this fall for the grubs to survive, particularly Japanese beetle.

Trichlorfon (Dylox) is likely to be most effective at this time of year and kills the grubs within about 3 days. Treatment is effective as long as the grubs are in the root zone. Japanese beetle grubs will be there until the soil temperature drops below 60°F; masked chafers, annual white grubs, will be in the root zone until the temperature drops below 50°F. An easy way to tell whether you can still treat the grubs is to pull back the sod. If the grubs are still present in the root zone, then treatment should be effective. *(Phil Nixon)*

Soaps and Detergents: Are They Safe To Use?

Insecticidal soaps are useful in controlling various insect and mite pests in landscapes and nurseries, including aphids, scales, mealybugs, and twospotted spider mite. A soap is a substance derived from the activity of an alkali such as sodium (hard soap) or potassium (soft soap) hydroxide on a fat. Fats are generally a blend of particular fatty acid chain lengths. Soap is a general term for the salts of fatty acids.

Soft-bodied pests such as aphids, the crawler stage of scales and mealybugs, thrips, whiteflies, and mites are most susceptible to soap applications. Soaps generally have minimal activity on beetles and other hard-bodied insects. Soaps are effective only when insects or mites come into direct contact with the spray. Dried residues on plant surfaces have minimal insect or mite activity as soap residues degrade rapidly.

Soaps kill insect and mite pests in one of three ways—although the mode of action is still undetermined. (1) Soaps may work by penetration of the fatty acids through the insect's outer covering (cuticle) and dissolving or disrupting cell membranes. This disrupts cell integrity, causing cells to leak and collapse, destroying respiratory functions, and resulting in dehydration and death of the insect. (2) Soaps may act as insect-growth regulators, interfering with cellular metabolism and production of growth hormones during metamorphosis. (3) Soaps may block the spiracles (breathing pores), interfering with respiration.

There are a variety of fatty acids; however, only certain ones have insecticidal properties. This trait is related to the length of the carbon-based fatty acid chains. Most soaps with insect and mite activity are composed of long-chain fatty acids (10- or 18-carbon chains), whereas shorter-chain fatty acids (9-carbon chains or fewer) have herbicidal properties.

There is a general misconception that any soap or detergent can be used as an insecticide. Although only a few select soaps have insecticidal properties, many common household soaps and detergents including Palmolive, Dawn, Ivory,

Joy, Tide, and Dove, which are unlabeled insecticides, have some activity on many soft-bodied insects when applied to plants as a 1 or 2% aqueous solution. However, reliability is less predictable than soaps formulated as insecticides.

Dishwashing liquids and laundry detergents are primarily designed to dissolve grease from dishes and clean clothes, not to kill insects. These materials may cause plant injury by dissolving the waxy cuticle on the leaf surfaces. Registered, commercially available insecticidal soaps are less likely to dissolve plant waxes. Also, plants with pubescent (hairy) leaves may be more susceptible to injury from dishwashing liquids and detergents. Dishwashing liquids and laundry detergents, like insecticidal soaps, lack any residual activity; and thus more frequent applications are needed. However, too many applications harm certain plant types. In addition, detergents are chemically different from soaps and may cause phytotoxicity. In fact, many hand soaps are not necessarily pure fatty acids. Most importantly, these solutions are not registered insecticides. Soap companies don't intend their products to be used as insecticides, as they have not gone through the Environmental Protection Agency (EPA) registration process.

Soaps, even insecticidal soaps, may be directly and indirectly harmful to natural enemies. For example, one study showed insecticidal soap to harm the predatory mite, *Phytoseiulus persimilis*. In another study, a 4% application rate of insecticidal soap was moderately harmful (80 to 99% mortality) to the western flower thrips *(Frankliniella occidentalis)* predator, *Neoseiulus* (= *Amblyseius*) *cucumeris*.

The type of fatty acid, length of the carbon-based fatty acid chain, and concentration in many laundry and dish soaps is not known. Also, the insecticidal effectiveness may be compromised by coloring agents or perfumes, oftentimes leading to inconsistent results. Certain laundry and dish soaps precipitate in "hard" water, thus reducing their effectiveness.

Despite the activity of some dishwashing liquids and laundry soaps on insect and mite pests, their use in landscapes and nurseries should be avoided primarily because they are not registered insecticides. Even more important is that a pest control company generally stands behind a product when there is a problem. If dish or laundry soap is used and plants are injured, there is no recourse. *(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 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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