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Pest Management Retailer Training Website

Previous studies have shown that most homeowners buy pesticides from retail stores with lawn and garden centers and that store employees are often asked to make pest management recommendations.

Responsible Pest Management for Retailers

(<http://web.extension.uiuc.edu/rpmr>) is an online training course that will take retailers through various aspects of Integrated Pest Management (IPM) and discuss options for pest control. The website consists of five training components covering: Integrated Pest Management, understanding pesticides, understanding labels, human pesticide protection, and store safety. Participants must register online and pay a fee to take the course. The online class should take about three hours to complete, but individuals can work at their own pace and come back to each section at any time. After successfully finishing all five modules, they will receive a certificate of completion.

As retail store employees become more knowledgeable about IPM, this should improve their ability to make recommendations and ultimately reduce risk to consumers and the environment. The web site was developed by University of Illinois Extension and was

partially funded by a grant from U.S. EPA Region 5 in cooperation with the Illinois Department of Agriculture. For more information, please contact George Czapar at (217) 782-6515 or gfc@illinois.edu.--*Phil Nixon, slightly modified fact sheet*

Coincide

Don Orton's original edition of this book was published in 1989. *Coincide* addresses the prediction of pest occurrence on ornamental plants by using phenology. With phenology, stages of plant development (usually bloom time) are used to predict stages in pest development. This method is more accurate than using calendar dates because the plant is exposed to the same climatic conditions as the insect. Thus, "early" and "late" springs associated with unusually high or low temperatures, respectively, cause similar responses in both plant and insect. Degree days can also be used to accurately predict pest occurrence, and *Coincide* provides these numbers as well.

Phenology helps predict when pest stages susceptible to control are likely to be present, but it is not a spray guide. When a phenological event predicts that a pest is susceptible to control, one needs to scout to verify that the pest is

present and in a susceptible stage before using a control measure.

A major revision of this book was published in 2007 that contains a few additional insects, but also covers diseases. The name of the book was changed to *Coincide: The Orton System of Pest and Disease Management*. It is still available from Dennis W. Jamieson, Labor of Love Conservatory, 723 Dawes Avenue, Wheaton, IL 60189-6587. The publisher can also be contacted at 630-668-8597 and dennyjam@aol.com. The price per book is \$39.00 plus \$5.00 shipping and handling. *Coincide* is also available through some trade organizations and bookstores, including The Morton Arboretum Gift Shop.--*Phil Nixon*

Scouting Watch

Bridal wreath spirea, or Vanhoutte spirea (*Spiraea x vanhouttei*), is blooming in southern and central Illinois. This is a major phenology plant in Don Orton's book *Coincide*. Following are the most common pests that are in susceptible treatment stages during Vanhoutte spirea bloom.

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; euonymus caterpillar early webbing, oystershell scale (brown) crawlers.

Finishing bloom: Bronze birch borer newly hatched larvae.

Most blossoms brown, still a few white: Flat-headed appletree borer larval hatch; peach tree borer newly hatched larvae; viburnum borer newly hatched larvae.

Bloom finished: Oystershell scale (gray) crawlers. --*Phil Nixon*

Black Turfgrass Ataenius

Black turfgrass ataenius is primarily a pest of highly-irrigated, highly-maintained turfgrass. Although the white grubs can be found in home lawns, they are rarely numerous enough to be a problem. They are a serious problem on golf courses, particularly in high-irrigated areas such as greens, tees, and swales in fairways.

Black turfgrass ataenius grubs look similar to other white grubs and cause similar root-feeding damage. They cause brown turf areas that can easily be pulled up with the first generation damage being heaviest in late June and early July. However, the grubs are smaller than other grubs, with full size being about one-quarter inch long. They do not have a raster pattern on the underside of the last abdominal segment. Instead, they have two large pads in that location.

Adults overwinter under leaf litter and other debris in moist areas. On a golf course, this is commonly under trees between fairways where drainage from the fairways keeps the area moist much of the year. In the spring, as bridal wreath spirea is in full bloom, the

beetles fly onto the greens, tees, and fairways to lay eggs. The beetles are cylindrical and about one-quarter inch long. When they emerge from pupae, they are brownish and take several days to mature to black. When the beetles are on the course laying eggs in the soil, they are easily seen in the clippings baskets of the greens mowers. This is the scouting method that we recommend.

If beetles are numerous in the clippings baskets, apply a long-lasting grub insecticide about two weeks later. Effective insecticides include imidacloprid (Merit), halofenozide (Mach 2), thiamethoxam (Meridian), clothianidin (Arena), and chlorantraniliprole (Acelepryn). These insecticides should control the black turfgrass *ataenius* first generation grubs and remain effective to control second generation black turfgrass *ataenius* grubs as well as Japanese beetle and masked chafer grubs in August--*Phil Nixon*

White Pine Problems

Over the last 25 or more years, white pine samples have arrived at the Plant Clinic fairly regularly. The problem is an apparently sudden change from healthy, dark green foliage to pale, sickly looking foliage. This early in the season growers complain that affected white pines are growing very slowly or appear dead like the one in the image.

Of course, most want to blame this condition on a plant disease. That would be fine with me too, if I could find one to blame. For the record, white pines are not common hosts for pinewood nematodes. Yes, we have found

pinewood nematodes on a couple of white pines over the last thirty years, but these trees were already near death. It is thought that the nematodes were secondary in those few cases. It is highly unlikely that pinewood nematodes are involved in your white pine problems.

There are few needle blight diseases on white pine. Additionally, if there were, you would certainly see spots, band, or fruiting bodies. Incubated tissue yields nothing pathogenic. Keep in mind that all plant material will rot when you incubate it long enough. Fungal pathogens will show their fruiting bodies or spores in 24-48 hours of incubation.

Two root rots do affect white pine. Both require poor drainage and extended wet soil conditions. *Phytophthora* and *Procerum* are found in these conditions and cause black, soft root rot. Both are also considered to be secondary to the site problems listed.

So, what is causing the decline of many white pines in Illinois? The Plant Clinic staff has assayed samples for the presence of pinewood nematodes; has cultured for fungal pathogens of needles, stems, and roots; and inspected for insect infestations or injuries. The only common factor seems to be root decline. Few live white roots have been found, but fungal pathogens cannot be correlated with poor rooting. It appears that roots are on the decline for other reasons. Some possibilities include heat, drought, flooding, deep planting, and sudden extremes in temperature and moisture. The image shows the difference between a healthy white pine root system and one from a tree with decline.

Because these problems in white pine are not usually the result of an infectious disease, immediate removal of the tree is not necessary. Instead, try to keep the tree watered in periods of drought, and see how it responds. Also, try digging into a bit of the root system for a better picture of the situation. If roots are brown in cross-section and the outer layer easily pulls off or is not present, then root injury has occurred. If the roots are white and healthy, then the problem is aboveground and our theory is wrong, at least in your case.

Another factor that may be involved in Illinois is the pH of the soil. Our landscape soils have a fairly high pH level whereas pines prefer more acid soils. It may be helpful to fertilize with an acidic fertilizer specifically packaged for pines or acid loving plants. Follow the directions so as not to burn the roots by applying too much fertilizer. Fertilization is usually recommended in early spring or late fall.--*Nancy Pataky*

Holly Leaf Discoloration

Holly species in Illinois are not typically bothered by many diseases. The leaves pictured were submitted recently to the University of Illinois Plant Clinic as a disease suspect. We did not find a pathogen associated with these leaves. The black blotches are most likely environmental in origin. We see blotching on holly leaves in winter, especially in heavily shaded locations. Scorch would appear as leaf edge burn. No fungicides were warranted. Hollies grow best in light, well-drained, slightly acidic soils, so action recommended was to try to maintain these conditions.

The foliar diseases found on holly include tar spot (*Phacidium curtisii*), Coniothyrium leaf spot (*Coniothyrium ilicinum*), and Alternaria leaf spot. Sometimes hollies also have algal leaf spot. These pathogens cause distinct spots as compared to the general black blotching of the image. Although all occur in Illinois, we rarely see these diseases.

The light color of the foliage suggests a possible root problem or possibly low nitrogen. It is suggested that growers inspect roots in these cases. Root decline from wet conditions, root rot pathogens, mechanical injury, etc could cause smaller than normal leaves that are light in color and exhibit weak growth. There are two root diseases that occur on holly. These are black root rot (*Thielaviopsis basicola*) and Phytophthora root rot (*Phytophthora cinnamomi*). Both will cause roots to turn black, internally and externally. If roots are rotted, consult the help of a diagnostic lab.

Commercial growers might also be concerned with root feeding nematodes on hollies. These nematodes are microscopic. They feed on roots causing aboveground symptoms that include chlorosis, stunting, leaf drop, and plant decline. Most diagnostic labs can test the soil or potting medium for the presence of high populations of nematodes. Of concern are ring, root-knot, and stunt nematodes. Nematodes are more of a problem in field grown hollies where the soil is light textured and sandy. --*Nancy Pataky*

Dothistroma Needle Blight

This fungal disease occurs mainly on Austrian pine in Illinois. Infection of old and new needles may occur from May

into October. If you have identified this as a problem on your pine, fungicide applications should be considered. They are applied just before buds begin to elongate/swell and repeated in wet seasons according to label directions. Affected needles from past years can serve as a source of inoculum on new needles. Spores are spread from infected needles by wind and water.

Unfortunately, the products registered specifically for control of this pathogen are all protective/contact chemicals. They will wash off with rain and may need to be repeated more frequently to continue to protect foliage. None have systemic activity. They include Camelot, Junction, Kocide, and Phyton 27. Copper, copper sulfate, and mancozeb available in home gardener package sizes can be used by home growers trying to control the disease in the home landscape.

There are a few products with a more general, ornamental label. Read the label carefully to be certain the product is registered for the host (pine) and the disease (*Dothistroma* needle blight).

Of course, before you start spraying, be certain of your diagnosis. *Dothistroma* blight causes the lower needles in the tree to have bands of brown or yellow tissue. Often the tissue beyond those bands dries out, resulting in death of the needle tips as seen in the image. The overall appearance is browning of the lower third to half of the tree. Early defoliation may occur in spring and summer. Do not confuse these symptoms with salt burn or scorch which cause needle tips to turn brown on the exposed side of the tree. If *Dothistroma* is present, fruiting bodies of the fungus (see image) will be found embedded in the needles. A diagnostic

lab can examine spores within those fruiting bodies to confirm this fungus.

Cultural controls to promote more rapid drying of foliage may help. Suggestions are to prune overgrown plants in the area, control weeds, and use proper spacing of plants.

In the home landscape some control of *Dothistroma* blight may be attained by removing fallen needles and helping tree vitality through fertilization and watering practices.

For more information, consult report on plant disease no. 624, Needle Blights and Needle Casts of Pines. This report is available on the web at <http://www.aces.uiuc.edu/~vista/abstracts/a624.html> or in your local extension office.--*Nancy Pataky*

Invasive Species Spotlight: Hemlock Woolly Adelgid

The hemlock woolly adelgid was first identified in 1924 in the Pacific Northwest and in the 1950's in Richmond, Virginia. Infested areas of eastern and Carolina hemlocks in the eastern United States are increasing in number (http://na.fs.fed.us/fhp/hwa/distribution_maps.shtm).

Adelgids are mostly associated with coniferous trees. Hemlock is the primary host, with spruce being a possible secondary (alternative) host. The adelgid feeds on the sap of these trees, which can deplete its essential fluid and nutrient supplies, and produces saliva which contains toxins harmful to the trees.

These small aphid-like insects are less than 1/16 in long, black in color, and usually covered in a white puffy wax which progressively becomes thicker during their one year life cycle. The wax serves as a barrier to protect them from predators as well as to keep them from drying out during low humidity. They are usually found in great numbers almost covering entire sections of tree branches.

Figure 1. Hemlock woolly adelgid (photo courtesy of Connecticut Agricultural Experiment Station Archive, Connecticut Agricultural Experiment Station, Bugwood.org)

This particular species often undergoes a brief period of dormancy during the heat of the summer but can still be found on the stems of the plant. Adelgids, like many aphids, reproduce parthenogenetically, that is, the entire population is female and undergoes asexual reproduction. It can reproduce in large numbers very quickly. A typical adelgid can produce up to 300 eggs at a time and can reproduce twice in one year. While their populations increase on a tree, growth becomes stunted and needles begin to fade and fall off the tree. Within a few years a highly infested tree will perish.

Although the natural growing range of hemlock trees is just to the east of Illinois, these plants are quite adapted to landscape use and are popular in many areas within the state. Hemlocks make interesting trees in the cultivated landscape. They provide year-round color and soft textures. These insects have spread rapidly through the Appalachians, mostly by wind or carried by migratory birds, mammals, and

humans. However, infested nursery stock has also carried the insect into some areas. This is a concern within the state of Illinois.

Because the hemlock woolly adelgid has no real natural predators in the eastern United States, its populations have grown rapidly, allowing it to cause large amounts of damage to hemlock stands. Researchers are investigating the benefits and efficiency of introducing predatory insects into infested areas to serve as a control measure in large forested areas. Other treatments successfully used for individual trees include systemic insecticides, horticultural oils, and insecticidal soaps.

More information on the hemlock woolly adelgid can be found at Invasive.Org (<http://www.invasive.org/species/subject.cfm?sub=289>) or visit the Illinois CAPS website (<http://www.inhs.illinois.edu/research/CAPS/>) for all the latest news on invasive pests in Illinois.--*Kelly Estes*