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PLANT DISEASES

Disease Management Resources

Everywhere, there are signs that spring has arrived. As you go about your springtime activities, keep in mind that many plant pathogens are “anxious” to break out of winter dormancy.

University of Illinois Extension offers many resources to help you prevent, identify, and manage pest problems. Through our newsletters, diagnostic services, and a host of fact sheets, we stress the importance of understanding disease biology; and we promote an integrated pest management approach, which may include nonchemical as well as chemical options.

Sometimes pesticide applications are necessary to manage certain pests. When faced with shelves of pesticides, finding a legal and appropriate pesticide for the plant and pest can be daunting. Pesticide labels are frequently reviewed and changed for many reasons, including host additions or deletions, changes in rate or application method, and environmental and human-safety issues. Beyond the legal issues, we must also deal with new product names due to marketing tactics and company mergers. Most would agree that it is difficult to keep up with these changes.

When you’ve determined that you want to use a pesticide, how can you save some time? For the turfgrass and ornamental enthusiasts and professionals, U of I Extension offers two handbooks with pesticide recommendations: *Home, Yard and Garden Pest Guide* and the *Commercial Landscape and Turfgrass Pest Management Handbook*. These handbooks are revised every 2 or 3 years. This year, the *Home, Yard and Garden Pest Guide* was revised and will be available in late April.

In chapter 4 of the 2004 *Home, Yard and Garden Pest Guide*, you’ll find pesticide recommendations, timing comments, and references to detailed disease fact sheets for turfgrass, woody ornamentals, and flowers and other nonwoody ornamentals. Information is organized by host plant and then by disease. Following is a list of significant changes for 2004.

First, the labeled pesticides are now arranged by active ingredient, with specific product names in parentheses. This was done to increase the statewide

utility and “shelf life” of the publication. As previously mentioned, product names change often, yet the number and kinds of active ingredients on the market do not. If you can’t find the recommended product, look for the recommended active ingredient on other product labels. Just be sure the new product is labeled for the way you intend to use it (that is, site and plant). The 2004 version lists 44 fungicide products (up from 31 in 2001). Of these, 13 contain a systemic active ingredient (10 in 2001). However, the number of different active ingredients remained fairly stable. There was no change in the number of systemic active ingredients; myclobutanil, propiconazole, triforine, and thiophanate-methyl remain on the market.

Second, a new table lists products labeled for most ornamentals. Besides listing a few specific plants, these product labels indicate the product may be used on a wide range of similar ornamentals. This table is especially useful if you are looking for a fungicide to use on plants that are relatively uncommon nationwide or that have few disease problems. As always, read the label instructions and precautions carefully.

Finally, even though it’s not new to this version, please remember that there is a table at the end of the chapter providing more information about each pesticide and whether it is systemic or contact.

A final reminder: Keep in mind that a pesticide label is a legal document. Regardless of what you read online, in a recommendation guide/handbook, or elsewhere, the user is responsible for reading and following the label that accompanies the product at the time of purchase. (Bruce Paulsrud)

Cedar–Apple and Related Rusts Primer

There are various rust diseases on landscape trees. The cedar–apple and related rusts are most universal and therefore receive the most attention, at least in Illinois. Pine–pine rust galls and pine–oak rust galls also had some recent appearances in Illinois nurseries and landscapes. In addition, white pine blister rust has some historical significance but is currently rare in Illinois landscapes.

The three major cedar–apple and related rusts that we see in Illinois are cedar–apple rust, cedar–quince rust, and cedar–hawthorn rust. These are appropriately named for the alternate hosts on which they occur or

the hosts on which they were first reported. Landscapers and homeowners are most frequently concerned about crabapples with cedar–apple rust and hawthorns with cedar–hawthorn rust or cedar–quince rust. The cedar host (red-cedar and therefore actually a juniper species) is not significantly harmed, and management strategies are usually concentrated on the crabapple or hawthorn host. Hawthorns have been plagued by cedar–quince rust in the past 5 years. This rust does not affect the leaves but causes unsightly galls or swellings on the hawthorn stems. The galls turn black and may girdle and kill the twig from that point outward. Cedar–hawthorn rust causes only leaf spotting.

Details can be found in the Illinois publication, *Report on Plant Disease*, no. 802, “Rust Diseases of Apple, Crabapple, and Hawthorn,” available in an alphabetical listing under horticulture publications at <http://www.ag.uiuc.edu/%7Evista/>. Illinois Extension offices should also have this publication.

Management strategies include the use of resistant cultivars, removal of galls on junipers where feasible, and use of preventive fungicide. There are many choices of resistant crabapple cultivars. At this U of I Web site, http://www.extension.uiuc.edu/IPLANT/plant_select/trees.htm, you will find a very informative article on selecting crabapples, including a listing of cultivars that can be grown in Illinois. This list rates plant disease reaction to cedar–apple rust, as well as to scab and fire blight. An Ohio publication, *Cedar Rust Diseases of Ornamental Plants*, lists some resistant junipers, crabapples, and hawthorns. This publication can be found at <http://ohioline.osu.edu/hyg-fact/3000/3055.html>.

Chemical options are also available for disease control. Where problems have occurred in the past and resistance is not available, fungicides may be sprayed annually to prevent infection. The sprays must be applied before or soon after spores arrive on the crabapple or hawthorn. Most recommendations tell us to make the initial spray when crabapples are in pink bud and then to continue sprays through petal fall. For hawthorns, the recommendation is similar but lasting 2 weeks after petal fall. Read product labels for recommended spray intervals. The idea is to protect the plants from spores that are moving from junipers to the susceptible plants when those plants are most vulnerable to infection. If you have some infected junipers with rust galls, you can observe when the horns emerge and spores form. Protective fungicide sprays should be applied at that time. As this article is being written (April 16), cedar–apple rust galls in Champaign already have horns emerging from the galls. There are many chemical options available in the 2004 *Home, Yard, and Garden Pest Guide* and

the 2003 *Commercial Landscape & Turfgrass Pest Management Handbook*. For longer fungicide activity, a systemic product should be considered. Tables at the end of appropriate chapters provide mobility information on each chemical listed. (Nancy Pataky)

Spruce Needle Cast Confusion

There is only one major needle cast disease to deal with in Illinois, *Rhizosphaera* needle cast. We sometimes see spruce needle rust or another secondary fungus, but those instances are few. *Rhizosphaera* needle cast is most severe on Colorado blue spruce, with Norway spruce being resistant. The most diagnostic symptom is the yellow to brown color of 1-year-old needles, while newest needles remain green. Unfortunately, other problems can also cause these symptoms: spider mites, drought, and even scale insects. *Rhizosphaera* fungus readily forms characteristic fruiting bodies on affected needles placed in a moisture chamber for 24 hours. If you have seen the described discoloration followed by needle drop, place some of the brown needles (taken from the tree, not the ground) in a moisture chamber to determine whether fruiting bodies are present. You can also send a sample to the Plant Clinic. The clinic opens May 1 but can handle suspect *Rhizosphaera* samples now if sprays are being considered.

If you had problems with this disease in the past, keep in mind that spores will be infecting new growth as it emerges this spring. If the fungus is present, protective sprays can help keep the disease managed. Although the disease does not kill your spruce, repeated defoliation causes bare limbs, which soon result in an unsightly tree. Fungicides are applied when the new growth is 1/2 to 1 inch long and again when fully elongated. Stressed trees are more susceptible to infection. It is helpful to provide spruces with a well-drained site. Keep the tree mulched, well watered in drought, and fertilized annually. Prune surrounding plant material to promote air movement.

Pictures of infected needles and fruiting bodies of the *Rhizosphaera* fungus can be found in this forest service pest alert of the disease on fir: http://www.na.fs.fed.us/spfo/pubs/pest_al/rhizo/rhizo.htm. Another site to visit is the Kansas State fact sheet at http://www.oznet.ksu.edu/dp_hfrr/extensn/problems/rhizosph.htm. (Nancy Pataky)

INSECTS

Scouting Watch

Hemlock rust mites cause hemlock foliage, particularly the older needles, to turn yellow and fall off the tree. Heavy infestations can cause severe defoliation.

These are eriophyid mites, which are too small to be seen with the unaided eye: With a 10X hand lens, they appear as elongated, cigar-shaped mites with all four legs at the front of the body. Treatment at this time with bifenthrin (Talstar), insecticidal soap, or summer spray oil reduces damage through the season.

Juniper webworm and **arborvitae leafminer** overwinter as larvae and become active in the spring. At this time, they are active and can be controlled with thorough applications of acephate (Orthene). Juniper webworm causes the foliage on branches or entire plants to turn brown, usually in early summer. Fine silk webbing will be on the branches. Arborvitae leafminer mines in the scalelike leaves in late summer but becomes more exposed to insecticides when feeding resumes in the spring. Tips of branches turn whitish and then brown. With severe infestations, entire arborvitae shrubs or trees turn brown.

Northern pine weevil is primarily a pest to Christmas tree growers. This insect develops as larvae in old stumps, emerging at this time as adults that move to seedlings and other pines nearby. They feed on the bark of small branches, causing dieback. Seedlings are likely to die, and larger trees can lose branches, resulting in unsalable trees. Spraying the stumps at this time with cyfluthrin (Tempo) or permethrin (Pounce, Astro) kills the emerging beetles. Removing stumps or leaving one live branch to keep the stump alive, prevents this insect. Growers that harvest fields at one time do not have this insect problem, as stumps are not near growing trees and seedlings.

Multicolored Asian lady beetles are very numerous at this time inside buildings. These 1/4-inch-in-diameter, orange to red beetles, with typically 19 black spots, have spent the winter inside the walls. Now that the walls are warming due to higher outside temperatures, the beetles are becoming active. As it is still too cold to stay outdoors, they come to the inside, where it is warmer. They do not reproduce indoors and will move outside for summer when it gets a little warmer. Vacuuming the beetles and dumping them outdoors is the most effective control at this time. Small light traps for use indoors are available that attract and catch these beetles at night. (*Phil Nixon and Morton Arboretum*)

European Pine Sawfly

Now is the time for eggs of the European pine sawfly, *Neodiprion sertifer*, to hatch into young larvae (not caterpillars) that are 1/4 inch long, olive green, with a distinct black head. The older larvae are over 1 inch long, with green stripes. European pine sawfly larvae are gregarious, tending to feed in large groups. When disturbed, the larvae arch back on their hind legs,

almost forming an S shape. This behavior is a defensive response to avoid predation. The larvae feed on needles of a wide range of pines; however, they are particularly fond of Scotch, red, and mugo pine. Larvae strip the needles of mature foliage, leaving only a central core, which is white and then turns brown. These damaged needles eventually fall off. Larvae typically are done feeding by the time needles emerge from the candelabra. As a result, emerging needles will not be damaged. Sawflies are not a major concern, as there is minimal threat of branch or tree death due to their feeding. However, the loss of second- and third-year needles may be a concern, as this injury can ruin the aesthetic appearance of landscape and Christmas trees. Later in the spring, the larvae fall to the ground and pupate in brown, leathery cocoons near the base of trees. The adults, which resemble wasps, emerge in the fall and deposit eggs in the needles before winter. Females create yellow scars in the needles with their ovipositor when laying eggs. In Illinois, there is one generation per year.

European pine sawfly infestations can be controlled by hand removal (if feasible) or by washing larvae off plants with a hard stream of water. If necessary, a number of insecticides may be applied to infested trees, including acephate (Orthene), azadirachtin (Azatin/Ornazin), carbaryl (Sevin), or spinosad (Conserve).

Although European pine sawfly larvae resemble caterpillars (Order: Lepidoptera), they are actually larvae of insects related to wasps (Order: Hymenoptera). So what does this mean? It means that the bacterial insecticide *Bacillus thuringiensis* var. *kurstaki* (Dipel and Thuricide) is not effective in controlling European pine sawfly. (*Raymond A. Cloyd*)

European Pine Shoot Moth

For professionals working in nurseries or Christmas tree plantations, it is time to be on the lookout for the European pine shoot moth, *Rhyacionia buoliana*. Although European pine shoot moth attacks several different types of pines, including red, mugo, Scots, and Austrian, the insect prefers Austrian and mugo pines. Repeated infestations of European pine shoot moth can distort trees to the point of reducing their marketability. So it is critical that spray applications of insecticides be performed before the larvae or caterpillars bore into the growing shoot because once inside the growing tips they are well protected from any insecticide application.

It is during early spring (right now!!) that the overwintering larvae of European pine shoot moth crawl onto new shoots and tunnel into the base of buds or shoots. The larvae eventually undergo a pupal stage

within the shoot tissues. In late May to early June, the European pine shoot moth adult female deposits small, flattened eggs on new pine shoots near the base of needles or bud scales during a 2- to 3-week period. The eggs hatch in early June into larvae that tunnel into the needle sheaths and then mine needles at or near the base. Early injury symptoms include yellowing needles near the tips of twigs and masses of pitch near the base of new bud clusters. The mined needles eventually turn brown and die. The larvae kill terminal and lateral growth when tunneling into the base of needles, shoots, or buds. Infested trees may eventually appear reddish due to an abundance of dead tips. Additionally, European pine shoot moth larvae commonly cause the candle to form a “shepherd’s crook” shape. Small trees growing in nurseries and landscapes may be killed under heavy infestations. In Christmas tree plantations, repeated infestations may result in trees appearing distorted, unsightly, and potentially unmarketable.

Resin-coated webbing may be present near wounds or entry sites created by larvae. In later summer to early fall, larvae discontinue feeding for the growing season and prepare to overwinter in needles near shoot tips mined during the summer. The larvae, which are 1/12 to 1/8 inch long, turn a deep black, covered with resin-coated webbing. European pine shoot moth has one generation per year in Illinois.

Management of European pine shoot moth primarily involves pruning or using insecticides. Normal shearing or pruning of Christmas trees in mid-July provides some measure of control in Christmas tree

plantations. Insecticides recommended for controlling European pine shoot moth include permethrin (Astro or Pounce) or phosmet (Imidan). These insecticides should be applied before larvae enter the growing shoot, which is normally in early spring, as well as late June or when hills-of-snow hydrangea (*Hydrangea arborescens* ‘Grandiflora’) is in early bloom. Concentrate spray applications on branch ends, where the larvae are most likely to be located.

Pheromone traps, which are used to detect male moth activity in June, can be used to help time spray applications. After the peak trap catch, spray 7 to 10 days later. It is important to irrigate trees during extended drought because dry weather and poor soil conditions may lead to increased susceptibility. (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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