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## INSECTS

### Asian Longhorned Beetle

Since first being detected in the Chicago metropolitan area over two years ago, the Asian longhorned beetle (ALB) has been under steady attack by city, state, and federal officials hoping to eradicate this destructive new pest. Intensive surveys using bucket trucks and U.S. Forest Service tree climbers have helped define the boundaries of infestation, but to prevent the spread of ALB outside these areas, more than 1,300 infested trees have been destroyed. While this strategy appears to be working, aesthetic and financial losses have been mounting, while ongoing surveys continue to detect infested trees. Regulatory officials and homeowners have been somewhat frustrated by the limited arsenal of weapons to battle the spread of ALB. Currently, tree removal is the only available means of control.

However, recent developments could change the course of this battle. Field tests of various systemic insecticides conducted by USDA and Chinese researchers in the beetle's homeland of China found that imidacloprid (commercially known in the United States as Merit or Imicide) may offer an effective means of protecting susceptible trees and help contain the spread of ALB. Preliminary results from tests in China showed both soil and trunk injections of imidacloprid readily transported the insecticide into stems, twigs, and foliage where newly emerged adult beetles feed before females deposit their eggs beneath the bark. This not only exposed many adult beetles to a lethal dose of insecticide but also produced some egg and early instar larvae mortality. This, of course, appears to be good news, but considerable testing in the United States will be necessary to determine the overall effectiveness of imidacloprid in the struggle against ALB. Will imidacloprid actually protect uninfested trees from future attack by ALB? If so, how long will it remain effective? What is the best application method? Will its effectiveness vary according to species of tree? Will imidacloprid help

trees already infested with the beetle? All these and probably more questions must be answered before imidacloprid can be labeled and recommended for use against ALB.

To answer these questions, APHIS (Animal and Plant Health Inspection Service of the U.S. Department of Agriculture) scientists will be conducting a combined research and operational study on the usefulness of imidacloprid in the current eradication program. The research component will compare the effectiveness of soil injection to trunk injection at four different locations within the Ravenswood core infestation. At each location, researchers will select 60 susceptible, uninfested trees to receive the following treatments: (1) soil injection (15 trees), (2) trunk injection (15 trees), and (3) 30 untreated check trees. Each tree will be regularly monitored for signs of beetle infestation; and bark, twig, and leaf samples will be collected monthly for laboratory assays of imidacloprid presence, activity, and persistence. Results of this study should provide many answers to questions concerning the potential use of imidacloprid as a protective treatment. The operational program can be viewed as a preemptive strike against the spread of ALB outside the known quarantine areas. Mass treatments of nearly 7,000 trees with trunk injections of imidacloprid are planned to create a "protected" buffer zone adjacent to the core infestation and at each of the outlying sites, including Addison and Summit. There is no guarantee that this approach will be effective, and infested trees will still be cut and chipped. But, based on results from the tests of imidacloprid in China and what we know about its use in the United States, there is reason for optimism. Imidacloprid is currently labeled for use against a wide range of sucking insect pests of trees and several soil and turf pests and has proved to be a safe, effective tool when properly used in sound integrated pest management programs. However, it is not yet legally approved for use against ALB; hence, the importance of the current studies. If it performs up to expectations, imidacloprid may prove to be another key weapon in the battle against this serious threat to our urban and national forests. (*Charlie Helm of the Illinois Natural History Survey and Phil Nixon*)

## Spruce Spider Mite

Spruce spider mite, *Oligonychus ununguis*, eggs have hatched now throughout the state. This hatching was observed during the first week of April in northeastern Illinois by Don Orton, Illinois Department of Agriculture. Now is the time to make spray applications before the mites have caused serious damage. Spruce spider mite is a cool-season mite in contrast to two-spotted spider mite, *Tetranychus urticae*, which is a warm-season mite. Spruce spider mite feeds on conifers such as spruce, arborvitae, hemlock, juniper, Douglas fir, and some pines. They use their piercing-sucking mouthparts to remove plant fluids and chlorophyll (green pigment). Injured foliage will generally appear bronze colored to brownish.

Adult mites are oval-shaped and approximately 1/60th of an inch long. Adults are black or tan, whereas the nymphs are light gray-green in color. Eggs, which are round and brown in color, are laid under bud scales or in the axils of needles. The overwintering eggs are laid on plants from September through November. These eggs hatch into nymphs. Spruce spider mites are present in high numbers from April through mid-May, although they are usually present into June in northern Illinois. It generally takes three to six days to go from egg to nymph. All motile or active stages primarily feed on needles, generally preferring older needles. There can be three generations per year.

Spruce spider mite presence can be verified by knocking them off branches onto a white sheet of paper where they are easily seen. They produce a green streak when smeared. Red streaks on the paper are indicative of predatory mites.

Management of spruce spider mite involves implementing proper cultural practices such as watering to minimize stress and the use of pest control materials. Pest control materials that may be used to manage spruce spider mite include bifenthrin (Talstar), dicofol (Kelthane), dimethoate (Cygon), summer oil, or insecticidal soap. Because these materials only work by contact activity, it is important to get thorough coverage. Be careful when using summer oils on blue-needled conifers as they may cause discoloration. (Raymond Cloyd)

## Greenhouse Management Workshop

The Second Annual Greenhouse Management Workshop will be held on June 20, 2000, at the Holiday Inn in Naperville, Illinois, from 10:00 a.m. to 4:00 p.m. Topics include keys to disease identification and

management, tips to keep plants nutritionally healthy, how to automate your pesticide record keeping, update on pest control materials, and guidelines to implement a biological control program in the greenhouse.

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## PLANT DISEASES \_\_\_\_\_

### Brown Spot and Dothistroma Blight of Pine

These two fungal needle diseases are very similar. Even with the aid of a microscope, we find it difficult to distinguish the spores of the causal fungi. Symptom expression is also similar. Infected pines may appear yellowed and sparsely foliated, especially near the bottom of the tree. Needles may have brown spots with yellow borders, and pinhead-sized fungal fruiting structures may appear embedded in the brown spots. Infection occurred last summer or fall and fungal fruiting bodies were formed at that time. This spring, as weather warms, the spores will be released and the infection cycle will continue. Fungicides are available to use in the management of these diseases but only in a protective mode of action. You need to identify the disease now and apply the fungicides to newly emerging needles to manage the diseases. Here are some tips on identification.

**Dothistroma needle blight** occurs most often on Austrian and Ponderosa pine. Both Scotch and red pine are resistant. The disease causes spots and bands on needles, especially on the lower part of the tree. The problem is more intense in a monoculture, such as a nursery or plantation, than in a landscaped area, but we have seen a fair amount of this needle blight the last several years in landscaped areas. I have confirmed two cases already this year.

Symptoms of Dothistroma first occur in the fall but may go unnoticed. Look closely at the needles now for yellow to brown bands or individual spots. If the disease is a problem, you won't have any trouble finding these lesions. Laboratory confirmation relies on finding the diagnostic fruiting bodies and spores within the spots. The fruiting bodies are black, pinhead-sized specks in the needle lesions. You can see these with a hand lens. If all that you see is brown needles, without spots, bands, or fruiting bodies, then Dothistroma blight and/or brown spot are not present.

As the disease progresses, needle tips turn brown and fall from the affected needles, leaving green needle bases. Early drop of entire needles is not uncommon.

**Brown spot needle blight** symptoms are nearly identical to those of *Dothistroma* blight. Scotch pine is the major host, and we generally make the distinction based on the presence of spores and the host species. Brown spot may begin in July with yellowing of needles, the development of brown spots in the yellowed areas, and sometimes the presence of a drop of resin on each spot. Brown bands with yellow halos are more often observed in the fall.

Management of these diseases may involve pruning surrounding plants for better air flow, thus allowing more rapid needle drying after rain, weed control, and proper plant spacing for the same reason; use of resistant varieties where available; working with trees in dry weather; and use of registered fungicides. Consult the *Illinois Commercial Landscape & Turfgrass Pest Management Handbook 2000* or the *Illinois Homeowner's Guide to Pest Management* for chemical options. Read the label of the product you choose carefully. Generally applications are made twice, and generally the label will say to spray when needles are half grown and again 30 days later. Still, each product differs slightly in timing of sprays. Also, there are more chemical options for preventing brown spot than for *Dothistroma*. The copper fungicides work for both diseases.

For more information on these needle blights, consult *Report on Plant Diseases* No. 624, *Needle Blights and Needle Casts of Pine*, available in Extension offices. It is also available free of charge on the Web at <http://www.ag.uiuc.edu/~vista/horticul.htm> (Nancy Pataky)

### Cedar-Apple and Related Rusts

The rust diseases cause yellow to orange to bronze colored spores in open pustules on the plant surface. They give the plant a rusty appearance; thus, the name of the disease. The cedar apple type of rusts in our area of the country usually refers to cedar-apple, cedar-hawthorn, and cedar-quince rusts. These are also known as the Gymnosporangium rust diseases. Each requires two host species to complete its life cycle, which is why the disease name is hyphenated with the name of two hosts.

The evergreen host for all three of these diseases is juniper or red cedar. That host now harbors brown galls of the rust fungus on its stems. Galls of cedar-apple rust are rounded and about 1 inch in diameter. Cedar-hawthorn rust galls are somewhat smaller and

more irregular. Cedar-quince galls are actually more of a swelling on the stem of the junipers rather than a gall. Any day now, you will see these galls begin to develop yellow to orange, gelatinous tendrils covering the gall surface. The spores on these tendrils blow to nearby broadleaf hosts in wet weather in April or May. Apple, crabapple, hawthorn, and quince are the major deciduous hosts in our area. Leaves, stems, or fruit might be infected, depending on the rust disease and host. The rusty colored spores once again make diagnosis easy on these hosts.

In most cases, control measures are focused on the deciduous host. Resistant cultivars would, of course, be the preferred method of control, but that is not always an option in an established landscape. If the disease occurs each year and trees are valuable specimens, fungicide protectants might be warranted. Consult the *Illinois Commercial Landscape & Turfgrass Pest Management Handbook 2000* or the *Illinois Homeowner's Guide to Pest Management* for chemical options. Landscapers who use fungicides complain most frequently about lack of disease control on hawthorns. The major issue is most often the timing of the chemical applications. The fungicides are used as protectants. Fungicide sprays to protect hawthorns must be started when new growth appears and flower buds begin to open. This varies with the location and weather conditions, so you will need to watch your hawthorns closely. Repeat applications also vary with the product chosen. Read the label on the chosen fungicide carefully for these details. If you have had problems with efficacy in the past, try one of the systemic fungicides that may give longer protection. Those listed in the commercial handbook as having some systemic activity include Banner, Bayleton, Duosan, Eagle, Spectro, Systhane, TwoSome, and Zyban.

More information on these rust diseases can be found in *Report on Plant Diseases* No. 802, *Rust Diseases of Apple, Crabapple, and Hawthorn*, available on the Web at <http://www.ag.uiuc.edu/~vista/horticul.htm> (Nancy Pataky)

### Rhizosphaera Needle Cast of Spruce

This fungal disease of spruce is aptly named "cast," because it causes needles one year and older to turn purple-brown and fall from the branches. Although this needle disease will not kill a tree, it will cause some serious aesthetic injury to the most majestic old spruce trees. Evergreens will not replace fallen needles, so infected trees often have holes of bare branches in their canopies.

If you have had trouble with this disease in the past, now is the time to take action to prevent its spread. If you think your spruce may be infected, read on to see what you can do now. Fungicides will stop this disease, but they must be applied when needles are half grown and again when fully grown.

The newest growth on infected spruce trees will be green and healthy. Last year's needles, however, will be brown or purple-brown and may still be attached to the tree branch. They will be cast soon. Other factors such as drought stress, root injury, flooding, fertilizer burn, and so forth could also cause similar symptoms. If the *Rhizosphaera* fungus is the cause of decline, it will be present in the purple-brown needles. When infected needles are moist, the fungal pathogen will form pinhead-sized fruiting structures (pycnidia) in rows on the needles. These stick up out of the needle like black pinheads. A simple test you can do is to place suspect needles in a plastic bag with a wet paper towel. Close the bag and seal with a twist tie. Wait for 24 hours and then use a hand lens to look for the diagnostic fungal structures.

Fungicides are used to protect healthy new growth, and that takes two sprays to accomplish. The critical factor is knowing when to apply the fungicide. Purchase the fungicide and have it ready to apply. You must watch your spruce to see when buds open and

new needles start to expand. Chemical options for control of *Rhizosphaera* of spruce need to be applied when the needles are half grown, so compare new growth to typical growth of the past year. There are many chemical options listed in the *Illinois Commercial Landscape & Turfgrass Pest Management Handbook 2000* and the *Illinois Homeowner's Guide to Pest Management*. (Nancy Pataky)

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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