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INSECTS

Pest Watch

Oak slug sawfly larvae are numerous on red oak at The Morton Arboretum in northeastern Illinois. They are called slug sawflies because the larvae have a superficial resemblance to slugs. They grow to about 3/4 inch long, are pale yellow, and are covered with a translucent slime. Because these insects are gregarious, the entire group of young larvae will likely be located on just one or two leaves that can be removed, ridding the tree of the entire infestation in the process. Many labeled insecticides are effective.

Bagworms have hatched throughout southern and central Illinois. Remember that control is most efficient if you wait for about two weeks after the caterpillars hatch. This allows all of the eggs to hatch and the caterpillars to finish blowing from tree to tree.

Adult Japanese beetles should be present in the Collinsville area as well as other areas of infestation in southern Illinois. They should show up in the rest of Illinois by the end of June. There are indications that Japanese beetle adults are attracted to previous feeding damage so control in these early days of infestation may reduce later damage. *(Phil Nixon and staff at The Morton Arboretum)*

Lilac/Ash Borer

This time of year, plants such as lilac, ash, and privet are susceptible to attack by the lilac borer, also known as the ash borer. Male moths have been present in pheromone traps at The Morton Arboretum for over a week, so we should be approaching peak emergence in northern Illinois.

Lilac borer adults are brown, slender, clearwing moths that resemble paper wasps. Peak moth flight occurs in early June. Females lay tan, oval eggs in cracks and crevices or wounds at the base of plant stems. Females live for approximately one week and can lay 300 to 400 eggs. Eggs hatch into cream-colored larvae with brown heads.

Larvae cause plant injury by creating tunnels and feeding within the bark. They also bore deeper into the wood to feed within the sapwood and heartwood. Their feeding restricts the flow of water and nutrients, causing shoots to die. The lilac borer generally feeds at the base of plant canes and at branch crotches, creating swollen areas or cracks in these areas. Larval feeding is evident by the light-colored sawdust below infected areas. Lilac borer overwinters as late instar larvae in the tunnels of stems. There is one generation per year.

Stressed plants are very susceptible to lilac borer infestations. Maintain proper cultural practices such as watering and fertilization. Avoid pruning plants in late spring and early summer when moths are present. A 2- to 3-foot-wide mulched area around the base of trees and shrubs will prevent plant injury from lawn mowers and weed whackers.

Chlorpyrifos (Dursban) can be applied to control lilac borer larvae before they enter the plant. Pheromone traps that capture adult males are available. Spray about 2 weeks after male moth catch in pheromone traps peaks. This should be close to when eggs are hatching. Another management option is the use of beneficial nematodes. Nematodes are applied as a heavy spray to the larval entry points. They will attack the larvae feeding within the tunnels. *(Raymond Cloyd and Phil Nixon)*

Western Flower Thrips

Western flower thrips (WFT) are major insect pests in greenhouse crop-production systems. These insects attack a wide range of horticultural crops, preferring plants with blue, purple, yellow, orange, and white flowers. Western flower thrips damage plants directly by feeding on leaves and flowers, and indirectly by vectoring the tospoviruses, tomato spotted wilt virus, and impatiens necrotic spot virus. Thrips are difficult to control in greenhouses because of their high reproductive capacity, short development time, a cryptic habit (they hide in unopened buds), resistance to many insecticides, and a high immigration rate.

The life cycle consists of an egg stage, two larval (immature) stages, two pupal stages, and the adult

stage. Adult western flower thrips are 2.0 mm long, and light yellow to brown in color. Development from egg to adult is temperature dependent. If temperatures are normal for June through August, the life cycle can be completed in 7 to 13 days. In general, the life cycle takes two to three weeks. Females live approximately 45 days and can lay up to 300 eggs during their lifetime. Eggs are inserted into plant leaves where they hatch into larvae that feed on plant foliage. The first larval stage lasts one to two days, and the second stage lasts two to four days. Western flower thrips then pupate in growing medium, leaf litter, or flowers. Adults emerge from pupae after approximately six days. They are generally found in flowers as they are heavy pollen feeders. The females require pollen for reproduction (egg laying).

Management of WFT involves a combination of diligently applied strategies. Scouting crops early helps detect populations before they get out of hand. Use either yellow or blue sticky cards. I prefer yellow cards because WFT are easier to see on them. Place the cards above the crop canopy to catch winged adults. This will help determine the effectiveness of your management strategies. When scouting, pay particular attention to plants located near openings such as doors, vents, and side walls. Concentrate scouting efforts on plants with blue, purple, yellow, orange, and white flowers. Greenhouse operations with gravel or soil floors should have sticky cards placed beneath benches to help detect thrips that may be pupating in the gravel or soil.

Proper sanitation is important in managing WFT. Remove all plant debris and old growing medium because these provide sites for thrips to hide and pupate. Control all weeds inside and outside the greenhouse. An Indiana grower and I demonstrated that thrips could easily immigrate into the greenhouse from weeds just outside vents. Removing flowers from plants that are not yet ready for sale will also help minimize thrips problems.

Many insecticides are used to control WFT (Table 1); these materials must be applied, however, before thrips enter unopened flower buds. After that point, it is very difficult to control them. Knowing this, you will want to control thrips before plants enter the bud stage. Clifford S. Sadof and I conducted research over the last three years at Purdue University that showed that Conserve is very effective in controlling WFT. However, don't base your thrips control program on one insecticide. It is important to rotate different chemical classes with different modes of action to minimize the potential for resistance. Three examples of possible rotation schemes follow.

Avid->Talstar->Mesurol->Conserve
Conserve->Orthene->Tame->Mesurol
Orthene->Talstar->Avid->Conserve

Remember that the organophosphates (Orthene and Duraguard) and carbamates (Dycarb and Mesurol) have similar modes of action, so spraying with Orthene, then switching to Mesurol is not a rotation scheme. Frequency of application is very important as most of the insecticides have no activity on the eggs and pupae stages. When generations overlap, more frequent applications, such as spraying every three to five days, may be necessary.

Biological control of WFT is another management, but it is difficult due to the characteristics mentioned. It is possible, however, under certain crop-production situations. I will discuss biological control of WFT in a future issue of this newsletter.

Table 1. Materials used to control western flower thrips.

Organophosphates:	**Chlorinated hydrocarbon:**
Acephate (Orthene)	Endosulfan (Endosulfan)
Chlorpyrifos (Duraguard)	**Macrocyclic lactone:**
Diazinon (Knox Out)	Abamectin (Avid)
Carbamates:	**Others:**
Bendiocarb (Dycarb)	Azadirachtin (Azatin)
Methiocarb (Mesurol)	Chlorpyrifos + Cyfluthrin (Duraplex)
Pyrethroids:	Insecticidal soap
Bifenthrin (Talstar/ Attain)	Spinosad (Conserve)
	Biologicals:
Cyfluthrin (Decathlon)	*Beauveria bassiana*
Fenpropathrin (Tame)	(Botanigard/Naturalis)
Lambda-Cyhalothrin (Topcide)	
Permethrin (Astro)	

(Raymond Cloyd)

PLANT DISEASES

Dutch Elm Disease

We have had a few confirmed cases of Dutch elm disease (DED) at the Plant Clinic this year, and The Morton Arboretum in the Chicago area has seen a few as well. Many believe this disease is a thing of the past because there are so few elms around now. Not so! Each year, at the Plant Clinic, we receive many

requests for testing for this fungus. Unfortunately, we are still able to make many positive isolations.

Dutch elm disease (DED) is caused by a fungal pathogen, *Ceratocystis ulmi*. The fungus works much like the other vascular pathogens, causing plugging of the vascular tissues and resultant wilting and death of foliage. American elms are very susceptible to this pathogen. Although Chinese elm and Siberian elm are known to be more resistant, infection of these species can occur as well. Work is still under way to develop resistant elms. So far, this work has produced the more resistant Sapporo Autumn Gold, American Liberty, and Urban elms.

Watch the elm for yellowing of the leaves, followed by wilting and browning. A single branch will usually show symptoms first (called flagging) with rapid spread to adjacent branches and the entire tree. Look for vascular discoloration to help with diagnosis of this disease. As with oak wilt (discussed last week), DED causes a streaking of the sapwood. Peel back the bark of a symptomatic branch to reveal the brown streaks in the otherwise tan outer sapwood. We generally select branches that are about as thick as a thumb with wilted leaves. Verticillium wilt and Dothiorella wilt can also cause this streaking in elm. Positive identification requires laboratory culturing of the fungus. Cut several 6- to 8-inch-long sections from wilting, but living, branches that show definite streaking in the sapwood. The fresh wood sections should be thumb thickness and can be sent in plastic or foil to the Plant Clinic for testing. Chilling the wood should not be necessary with suspect samples. Expect about seven days of lab time for the fungus to grow to the point where it can be positively identified. There is a $12.50 fee for this service, and payment must accompany the sample, or it will not be processed.

For more information on DED, including control procedures, consult *Report on Plant Disease* No. 647. A similar disease caused by a phytoplasma is discussed in RPD No. 660, "Elm Yellows or Phloem Necrosis and Its Control." *(Nancy Pataky)*

Brown Patch of Turf

Weather conditions in many parts of Illinois have been conducive to the development of brown patch on turf. This fungal disease is caused by a *Rhizoctonia* species. It commonly occurs in hot, muggy weather when night temperatures are at least 70°F and daytime temperatures are in the 80s and 90s. It is favored by heavy rains or watering and by grass that is dense and at least adequately fertilized.

Brown patch is easier to diagnose in the field than in the lab. Symptoms usually stand out most vividly in hot, moist, overcast weather. The disease appears in patches, up to 2 or 3 feet across. These patches may be dark blue initially, as though turf is under drought stress. The color quickly changes to purple-brown, then light brown. Patches may develop green centers and resemble summer patch and necrotic ring spot. In light infections, the turf generally recovers in 2 or 3 weeks. When the attack is severe, the crowns, rhizomes, stolons, and roots may turn brown and rot, causing turf to be thinned or killed in large areas.

Brown patch can be prevented by using cultural practices listed in *Report on Plant Disease* No. 411. If the disease occurs, chemicals may keep it from spreading, but long-term control requires following cultural recommendations. Chemical options are listed in the *Illinois Commercial Landscape & Turfgrass Pest Management Handbook* or the *Illinois Homeowners' Guide to Pest Management*. Read the label on the product for recommended formulation, rates, and timing for your turf conditions. Because such applications usually require sprays at 5- to 14-day intervals throughout the summer, fungicide control of brown patch is usually reserved for golf courses. Products are not always available in quantities suitable for homeowner use. For a severe infection in a home lawn, rake and remove the dead areas, follow cultural recommendations in the *Report on Plant Disease* and re-seed with a blend of resistant turf grasses suitable for the light requirements of the lawn. *(Nancy Pataky)*

Root Rots of Herbaceous Plants

Excessively wet soils early in the season have led to many cases of rotted roots on annuals, perennials, and nonwoody plants in the landscape. Plants may be stunted or low in vigor, may grow slowly, or may wilt easily on a warm day. Dry conditions following infection by a root rot pathogen cause plants to decline more rapidly. The foliage may turn yellow to brown and drop prematurely, usually starting with the older leaves and moving up the plant. Severity of the root rot depends on the fungal pathogen, the host's susceptibility, and the soil and moisture conditions.

If a root rot is suspected, the plant should be carefully removed from the soil, placed in a bucket of water, and the roots carefully washed of soil so they can be examined for indications of rotting. If roots are washed too vigorously, all of the rotted tissue is washed off, often leaving a white root interior that appears healthy. Close examination shows that such

roots are much thinner than healthy white roots. Wash the roots by gently moving the plant up and down in a bucket of water until soil is removed. A healthy plant has numerous white roots that appear fibrous. Roots of a diseased plant show various degrees of water soaking and usually are some shade of brown or black. The discolored roots are often soft and mushy while healthy roots are firm.

There are many root rot pathogens, but the major root rot fungi encountered in Illinois landscapes are *Rhizoctonia, Fusarium, Pythium,* and *Phytophthora*. In a very simplified scheme, we can group the first two fungi as those causing a dry rot, often with a reddish pink cast to affected roots. *Pythium* and *Phytophthora* can be grouped as the types causing a soft, brown-to-black rot of roots.

Control of root rots should be aimed at prevention: use of resistant varieties when root rots are known to be a problem, use of healthy transplants, proper site preparation to provide good water drainage away from roots, use of balanced fertilizer, and rotation in the garden plantings for two or three years with unrelated plants to help prevent the buildup of pathogens in one area. Remove crop residue at the end of the season to help reduce pathogen survival.

Even if all of these practices are followed, root rot may still occur. Fungicides are available to control the major groups of fungi discussed here. The fungicides protect plant stems and roots not yet affected. Their use seems most significant in cases where a root rot is discovered in a flower bed and the goal is to preserve remaining healthy plants to the end of the season. Specific chemicals are listed by host crop in the *Illinois Commercial Landscape and Turfgrass Pest Management Handbook* or the *Illinois Homeowners' Guide to Pest Management*. Consult *Report on Plant Disease* No. 615 for more details on root rots of garden plants. *(Nancy Pataky)*

Home, Yard & 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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