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### **Worker Protection Standard Resources**

The Worker Protection Standard (WPS) is a regulation issued by the U.S. Environmental Protection Agency. It is designed to limit workers' exposure to pesticides, reduce adverse health effects when exposure occurs, and inform and educate workers about hazards associated with occupational pesticide exposure.

If you employ even one person and produce agricultural plants on a farm or in a forest, nursery, or greenhouse, you must comply with all or part of the WPS provisions. This definition includes sod production as well as the production of ornamental and bedding plants. The provisions do not apply to landscape maintenance operations, home gardens, or greenhouses.

During 1999, the Illinois Department of Agriculture will be conducting WPS-specific compliance inspections. To find out more about the WPS provisions, consider accessing the University of Illinois Pesticide Safety Education Web site (<http://www.aces.uiuc.edu/~pse>; then select "Other Resources"). At this site, you can read and print the following publications: *The WPS: A Quick Guide to the Rule*, a new trifold introductory brochure; *The Worker Protection Standard in Illinois*, a new 19-page summary of EPA's *How to Comply Manual*; and *The WPS Resource Guide for Illinois Agricultural Employers* (recently revised). If you do not have Internet access, stop by your local U of I Extension office and ask for a printed copy of these materials. There may be a small printing fee. (Bruce Paulsrud and Phil Nixon)

## **INSECTS**

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### **European Pine Sawfly**

European pine sawfly larvae have been reported by The Morton Arboretum in northeastern Illinois and also in Bloomington. These insects feed mostly on mugo and scotch pine, but they will also attack other pines. In northern Illinois, they are only about 1/4

inch long, but already you can see black heads. When fully grown, sawflies will be from 3/4 to 1 inch long and will have several light and dark green stripes on each side of their body. Their head and first three pairs of legs are black. The larvae feed for weeks on old conifer needles but are finished feeding before the current year's needles emerge.

Birds feed on the larvae and rodents eat the pupae in the soil, but these predators are usually inadequate to control the larvae in urban areas. The larvae can easily be removed by hand because they feed in groups that usually number 20 or more. For chemical recommendations, refer to the *Illinois Commercial Landscape Turfgrass Pest & Management Handbook 1998-1999*. (The Morton Arboretum and Phil Nixon)

### **Elm Bark Beetle**

Adult elm bark beetles started appearing in pheromone traps at The Morton Arboretum on April 21. Remember, this is the insect that spreads Dutch elm disease. They are dark brown, only about 1/8 inch long, and they breed in dead or dying elm trees that still have bark attached. There are several generations each year so adults emerge at various times throughout the growing season. Although insecticide sprays can be used to control this insect, we recommend controlling Dutch elm disease through pruning out dead and dying branches and promptly removing dead trees. (The Morton Arboretum and Phil Nixon)

### **Eastern Tent Caterpillars**

Eastern tent caterpillars are present throughout the state. Some of the tents in southern Illinois are already several inches across and contain older caterpillars. Even in the southern part of the state, late-hatching eggs are responsible for small webs with young caterpillars as well. At The Morton Arboretum they are about 1/4 inch long, indicating that they haven't been out long. They will grow to 2 inches and become hairy with a white stripe down their backs and blue spots between longitudinal yellow lines. The larvae gather at a fork of a tree and build a web or "tent," but they leave the web to feed. Because they create a strand of silk wherever they go, the web enlarges as

the caterpillars eat. Severe defoliation only occurs when populations are high.

Control the caterpillar by tearing or pruning the webs out of the tree. This should be done when the caterpillars are in the nest and not out feeding; we suggest cloudy or rainy days or at night. Another option is to remove the overwintering egg masses before spring if you can find them. The egg masses are dark gray to black and are wrapped around twigs that are about the circumference of a pencil. *Bacillus thuringiensis kurstaki* (Bt) can also be sprayed on young larvae, but it will not kill mature larvae. For other chemical recommendations, refer to the *Illinois Commercial Landscape Turfgrass Pest & Management Handbook, 1998–1999*. (The Morton Arboretum and Phil Nixon)

## PLANT DISEASES

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### Plant Clinic Changes for 1999

In the first issue of this newsletter, we discussed the Plant Clinic at the University of Illinois and talked about its services. Please pass this information along to secretaries in your offices. These people are traditionally the ones who need the information to help clients. For some reason, secretaries are the last to hear about changes.

Since the late 1970s, we have been charging for samples submitted to the Plant Clinic. The charge pays a portion of clinic costs and allows the clinic to remain open. To be able to break even, we will have to raise the fees this season. We have tried to keep the increase minimal. The fees for 1999 follow:

\$12.50 for regular samples

\$18.75 for samples involving soybean cyst nematode, pinewood nematode, and special virus testing

\$40 for corn nematode assays

The fees must accompany the samples (no change) and will not be processed by the clinic until the diagnosis is completed. Fees should be paid by checks made payable to the University of Illinois or the Plant Clinic. Remember, the clinic does not open until May 3, so hold samples until that date.

If you have questions about the clinic, feel free to contact Nancy Pataky at patakyn@mail.aces.uiuc.edu. Before May 1, I can be reached by telephone at (217) 333-2478. The Plant Clinic telephone number is (217) 333-0519. (Nancy Pataky)

### Why Are My White Pines Dying?

We continue to see decline of white pines in Illinois, and I imagine this trend will continue as long as the tree exists in this state. No, this is not an epidemic. It is not even an infectious disease problem. It is a problem directly related to soil type, pH, water, and the white pine species requirements.

Symptoms vary but generally include some pattern of needle yellowing or browning, shriveled bark on branches or trunk, sap exudate on branches, and, in some cases, death of the tree. Affected trees have ranged in size from 2 feet to more than 20 feet.

Over the past 10 years or so, the Plant Clinic has assayed various white pine 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, and sudden extremes in temperature and moisture.

White pines thrive as understory trees in the cool, moist, well-drained soils of Wisconsin, although they grow with intermittent success in Illinois. Many of the problem trees we have seen have been situated on clay sites or exposed to the elements (for example, planted in new housing developments or used as windbreaks). It is also likely that site stress has contributed to the decline of these trees. The excessive rains of the past several springs may have contributed to root injury and decline by saturating the soil and causing a lack of soil oxygen.

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 drought stress 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, the problem is above ground and our theory is wrong, at least in your case. There are two root pathogens that are sometimes associated with this decline, but they are thought to follow the other problems mentioned. Both *Phytophthora* and *Verticillium* (*Procer*) have been found on occasion. Fungicides are not recommended because these root pathogens are not the cause of the decline.

Another factor that may be involved in Illinois is the pH of the soil. Our soils have a fairly high pH level, whereas pines prefer more acid soils. Start with a soil test to determine the pH level of the soil around your trees. It may be helpful to fertilize with an acid fertilizer specifically packaged for pines or acid-loving plants. Follow the directions so you don't burn the roots by applying too much fertilizer.

(Nancy Pataky)

### Common Queries in April

Maybe you have some of these questions. Some have clear answers and others do not.

**With a disease such as apple scab, I would like to use a systemic fungicide. Which of the recommended chemicals are systemic?**

If you refer to the *Illinois Commercial Landscape and Turfgrass Pest Management Handbook*, you will find the chemical options to protect against apple scab on crabapple listed on page 90. They include Banner, bordeaux, captan, Cleary 3336, copper, Domain, Eagle, Fore, Fungo, ISK Daconil, lime-sulfur, mancozeb, maneb, Phyton 27, Rubigan, sulfur, and Systhane. These products have been recommended after many hours of work looking through chemical company books. Most of this work was done by Bruce Paulsrud, pesticide applicator training specialist. The list includes products registered for this use and does not indicate efficacy. If you look on page 110 of the same manual, you will find a very helpful chart listing common and trade names of fungicides, as well as mobility in the plant—protective-contact, local penetrant, and systemic. The scab fungicides with systemic mobility include Banner, Cleary 3336, Domain, Eagle, Fungo, Rubigan, and Systhane.

**Many fungicide labels tell us to start applications at bud break. What does this mean? Is it flower buds or leaf buds?**

Bud break is the point at which buds swell and bud scales split apart. Usually, you can see some green tissue in the bud because leaves are beginning to emerge. The term refers to leaf buds. Flower buds have their own terms, including tight cluster, pink, bloom, and petal fall.

**I want to get a fungicide on my tree but rain is expected. If I wait until after the rain, I will be late with the fungicide. Should I spray now?**

This is a difficult decision to make. Chemicals have different rain-fast periods. And it is true that stickers applied with the chemical will help hold them to the

foliage. It is never appropriate to spray during rain or mist because the chemical will wash off the foliage. Without knowing the specific rain-fast period for your chemical (call the manufacturer), a general rule is that there should be 4 hours between the application and the next rain. Bruce Paulsrud checked with a few manufacturers and found that the rain-fast period for Banner Maxx is 4 hours; for Eagle, it is 4 hours; and Rubigan is rain-fast as soon as it dries.

**What is the reach-back effect?**

Some systemic fungicides have a so-called reach-back effect, meaning that they can eradicate a pathogen that has recently entered a plant. For example, Eagle is a fungicide that has a reach back of 96 hours (4 days). Applying it now is the same as if you had put the active ingredient in the plant 4 days earlier. Most products do not offer this sort of reach-back benefit.

(Nancy Pataky)

### Fungicide Updates

As new information about fungicides becomes available, we will try to pass it on to you. Bruce Paulsrud, pesticide applicator training specialist in plant pathology, has compiled the following information, adapted from *Agricultural Chemical News*, January and February 1999. This registration status information should not be considered a pesticide recommendation by the University of Illinois Extension; instead, it is an update on changes occurring in the green industry—changes we think you should be aware of. For more information, consult the *Pesticide Review Newsletter*, which can be viewed at <http://www.aces.uiuc.edu/~pse/newsletter/newsletter.html>.

Camelot (copper salts of fatty and rosin acids), Griffin. A new formulation developed for usage on ornamentals.

Chipco 26019 (iprodione), Rhone-Poulenc. The company has agreed to delete from their label all residential uses for this product.

Decree 50 WDG (fenhexamid), SePro. A new fungicide being developed for use on ornamentals to control botrytis.

Heritage (azoxystrobin), Zeneca. Received EPA approval to use for disease control on lawns and sports turf. Previously, it was only registered for golf courses and sod farms.

Junction (mancozeb/copper hydroxide), Griffin. A new formulation developed for use on ornamentals and turf.

Rovrol (iprodisone), Rhone-Poulenc. The manufacturer has proposed to EPA to cancel all residential uses, and, on strawberries, to increase the preharvest interval from 0 days to "Do not apply after first flower." On stone fruit, they propose to increase the 7-day preharvest interval up to "Do not apply after petal fall." On table grapes, they propose reducing the application rate from four times per season to one application per season at early to midbloom. On turf and ornamentals, they propose limiting the maximum number of applications to six per year (24 lb. ai/acre/year) and to cancel all uses on herbaceous ornamental seed.

If you have questions about specific chemicals, it is always best to get the information straight from the manufacturer. Look at your label, find the company's product information telephone number, and call them with your questions. (*Nancy Pataky and Bruce Paulsrud*)

## HORTICULTURE

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### Yellow-Bellied Sapsucker

Yellow-bellied sapsuckers overwinter in the southern United States and migrate north through the lower Midwest between late March and mid-May. During the summer, they live in the northern United States and southern Canada and migrate south through the lower Midwest between mid-September and mid-October. These are the only times that trees are damaged in Illinois, although the same bird apparently visits the same tree year after year.

These woodpeckers are almost 8 inches long with black-and-white backs and off-white breasts. The yellow belly is evident only on some birds in just the right lighting situation. Males have red on the throat and top of the head. Females have little or no red coloration.

Sapsucker damage is found on many ornamental and fruit trees; they commonly attack pine, birch, maple, and apple. They drill a series of holes in either horizontal or vertical rows in tree trunks or large limbs. Because they sit vertically on the trunk or along the long axis of the limb, these holes are located between branches. As sap flows into the holes, the sapsucker uses its brushlike tongue to draw the sap up along with any insects that are attracted to the sap. Sapsuckers will also periodically enlarge the holes and eat portions of the cambium, inner bark, and fresh sap.

In areas where the sapsuckers migrate only, such as Illinois, damage is rarely extensive enough to warrant control action. Trees in these areas where damage is very visible, such as near building entrances, may warrant control actions to reduce aesthetic damage. Where the birds spend the summer or winter, they can feed heavily enough on trees to kill them.

Woodpeckers are classified under the Migratory Bird Treaty Act as migratory insectivorous birds and are protected by both state and federal law. As a result, certain activities affecting them are subject to legal restriction. It is illegal for any person to kill, take, possess, transport, sell, or purchase them or their parts, such as feathers, nest, or eggs without a permit issued by the Illinois Department of Natural Resources or the U.S. Fish and Wildlife Service. However, a state or federal permit is not required to scare or harass a woodpecker that is causing damage.

Prompt and persistent action is required to deter a woodpecker that is attracted to a particular tree or area. The use of a combination of scaring techniques is more successful than relying on just one scaring technique or device. Strips of aluminum foil 3 to 4 inches wide and 3 to 4 feet long or similar-sized strips of cloth or plastic can be hung in front of the damaged area. Tin can lids or aluminum pie pans tied to heavy string so they will rattle and flash in the sun can also be used. Raptor silhouettes or effigies have been successfully used in some cases.

Repellents such as Tanglefoot, Bird Stop, and Roost-No-More can be applied to tree limbs and trunks to discourage sapsuckers. Or the repellents can first be applied to a thin piece of pressed board, ridged clear plastic sheets, or other suitable material, which is then fastened to the areas where damage is occurring.

Loosely wrapping sapsucker-damaged limbs in burlap, hardware cloth, or plastic will protect the area from further damage. Be sure to remove this wrapping after the birds have migrated through the area and before the weather becomes consistently warm. Treating the damaged areas with asphalt-based roofing paint has successfully repelled sapsuckers that were damaging fruit trees. (*Phil Nixon and Robert Corrigan; adapted and modified from Rex Marsh, University of California, Davis*)

### Preventing Crabgrass Invasions of Turf

Crabgrass was a common invader of turfgrass stands in 1998. Many turf managers and homeowners are concerned about a possible repeat performance in

Illinois during 1999. There are both cultural and chemical control options to consider.

Remember, crabgrass is a warm-season annual; no matter how many crabgrass plants appeared in turf last year, those plants are all dead now. Crabgrass seed germinates in late spring and summer, and the plant dies as temperatures cool and days become shorter in autumn. In between, the plant flowers and produces seed that will be the source of weed invasion for years to come. In order for crabgrass to return in 1999, seeds in the soil must germinate into new plants. This will not occur until soil temperatures get close to 60°F at the 1/4-inch level and remain there for several consecutive days.

Several turf management practices will help prevent crabgrass from appearing. One critical management area is mowing height, which has a major impact on crabgrass. Mowing between 2-1/2 and 3 inches will typically result in fewer crabgrass plants appearing in lawns and other turf areas. Crabgrass also likes frequent watering, especially frequent light sprinklings. Proper watering can help reduce crabgrass potential. Finally, complete cultivation activities before crabgrass seed germinates.

Crabgrass often invades bare soil or areas where the turf is thin. Avoid practices that damage the turfgrass stands in late spring or early summer. If possible, delay turf establishment or renovation work until late summer to avoid potential crabgrass problems. This also holds true for destructive practices such as dethatching.

Several preemergence herbicides are available to use in spring for crabgrass control. Specific herbicides include benefin, benefin/trifluralin, bensulide, dithiopyr, oxadiazon, pendimethalin, prodiamine, and siduron. Apply preemergence herbicides in mid- to late April in southern Illinois and early to mid-May (or sometimes later) in the northern part of the state. Although forsythia bloom is often mentioned as the time to apply preemergence herbicides, forsythia flower petal drop is often a better indicator. Remember to always read, understand, and follow pesticide label directions for the safest and most effective method of pest control.

One management problem associated with preemergence herbicides is seeding or overseeding practices. With the exception of siduron (Tupersan), all preemergence annual-grass weedkillers will also damage germinating desirable grass seed. Siduron can often be found in combination with a lawn-starter fertilizer as a weed-and-feed product in garden centers.

For homeowner use, many available preemergence crabgrass herbicides are found in combination with lawn fertilizer. These combination weed-and-feed products can provide crabgrass prevention and spring fertilization in a single application. Follow the rates given on the bag.

Homeowners have also been asking about corn gluten for crabgrass control. Corn gluten, available through mail-order catalogs (one example is W.O.W. or WithOut Weeds), is a byproduct of processing corn for animal feed. It does have some herbicidal activity and is also a source of organic nitrogen fertilizer. In the first few seasons of application, corn gluten does not usually provide crabgrass control that is as acceptable as most synthetic products. Subsequent use each season may provide improved crabgrass control. (Bruce Spangenberg and Tom Voigt)

### **Bulb-Forming Weeds in Turf**

Star-of-Bethlehem and wild garlic are two bulb-forming weeds that commonly invade turf areas. **Star-of-Bethlehem** (*Ornithogalum umbellatum*), also known as summer snowflake and starflower, is a common early-spring weed problem that occurs throughout Illinois. A member of the lily family, star-of-Bethlehem is a perennial bulb-former that has escaped old ornamental beds to invade lawns and also landscape and waste areas. Seed propagation is rare; it is primarily spread by small bulbs or bulblets. It is reported that all parts of star-of-Bethlehem are poisonous.

**Description:** The oval bulbs of star-of-Bethlehem are 1/2 to 1-1/2 inches long with fibrous roots at the base. Commonly, the bulbs will increase to form clumps. In early spring, tufts of fleshy, dark green linear leaves, approximately 4 to 12 inches long and up to 1/4 inch wide, emerge from the ground. Each leaf has a light-colored midrib. Shortly after the leaves emerge, branched, leafless flower stalks (scapes), similar in length to the leaves, appear. At the end of each branched stalk is a star-shaped flower appearing to have six white petals, each with a green stripe on the underside.

**Control:** Controlling star-of-Bethlehem is difficult; it emerges, flowers, and dies to the ground early in the spring growing period. A perusal of weed-control literature failed to identify any labeled chemical control options. Digging, drying, and discarding the bulbs is the most commonly recommended control practice. Occasionally, spring beauty (*Claytonia virginica*), a similar species, is mistaken for star-of-

Bethlehem. Spring beauty is a member of the purslane family and is a commonly found Illinois native. It emerges from fleshy, tuberous roots and produces elongated leaves approximately 6 inches long and 1/2 inch wide. Individual flowers of spring beauty have five petals (star-of-Bethlehem flowers have six) and are white tinged with pink. They occur in branched inflorescences at the ends of flowering stalks and usually bloom during March and April. Spring beauty is often found in moist woods or shaded areas.

Like star-of-Bethlehem, **wild garlic** (*Allium vineale*) is a cool-season, bulb-forming perennial member of the lily family that commonly reproduces by aerial and underground bulblets. Reproduction by seed in northern states is uncommon. A strong odor of garlic or onion is produced by all plant parts when smashed. Wild garlic is commonly found in fertile, poorly drained, fine-textured soils and thin turf areas.

**Description:** Beginning growth in early spring, the leaves of wild garlic develop from the bulbs into upright, grasslike plants. Stems can grow to more than 3 feet. The leaves of wild garlic are two-ranked, slender, hollow, nearly round, and attached halfway down on a waxy stem. The inflorescence is an umbel, 1 to 2 inches in diameter. The small, greenish white flowers are found on stems above the aerial bulblets. Flowering occurs during May and June. Less common is wild onion (*Allium canadense*). Wild onion appears and smells similar to wild garlic but has solid leaves.

**Control:** To control wild garlic without chemicals, maintain turf density and health through proper culture. Mow frequently and mechanically remove all portions of plants. Apply ester formulations of postemergence broadleaf herbicides containing combinations of 2,4-D, MCPP, MCPA, dicamba, triclopyr, or clopyralid during early to mid-spring when weeds are actively growing. (Tom Voigt, Bruce Spangenberg, Bruce Branham, and Tom Fermanian)

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