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PLANT DISEASES

Pine Wilt Watch

Pine wilt is a disease caused by pinewood nematodes *(Bursaphelenchus xylophilus).* The microscopic nematode is found in the wood of the tree. It plugs up the resin canal system in the host. These nematodes reproduce rapidly in the resin canals, damaging the resin canal cells and disrupting resin flow. The water-transport system becomes clogged, as with Dutch elm disease or oak wilt. The difference is that pine wilt is caused by a nematode, the others are caused by fungi.

Pine wilt symptoms to watch for at this time include gray–green foliage or needles that appear dull, off color. The tree will not improve. Instead, as the summer progresses, the foliage will turn yellow and then brown and remain attached for a long time. Trees that were infected last fall may not develop any new growth this spring. Although eventually the entire tree will be affected, initial symptoms may appear on one branch or area of the tree.

Many other problems can mimic this disease. Any factor that stresses roots, trunk, or water movement in the tree could cause similar symptoms. Transplant shock on young trees may cause these symptoms, as could drought stress or injury to roots by compaction. Sometimes chemical injury causes similar symptoms.

Pine wilt occurs on any of the pines we grow in Illinois except for white pine. Even that species may become infested after it has succumbed to other problems. In general, though, we do not see white pines infested with pinewood nematodes. Scotch and Austrian pines seem to be the common hosts in Illinois, but they are also the most commonly grown in our state.

There is no cure for a tree infested with pinewood nematodes. As soon as possible after a confirmation of pine wilt, the infested tree should be removed and burned or buried. The nematodes move from an infested tree to a healthy tree only on or in the vector, a sawyer beetle in the *Monochamus* species. This is why you may observe only one infested tree in a row of healthy pines. The beetle carrying the nematodes probably fed only on that tree before moving to another feeding site. You can help break this infection chain by removing infested trees. This helps remove nematodes that beetles may pick up and move from tree to tree. It is also helpful to maintain the health of other pines. Stressed or dying trees attract beetles that may carry nematodes to your trees.

Wood can be assayed in about 24 hours for the presence of this nematode. The Plant Clinic at the University of Illinois offers this service. Send wood from the suspect tree. Branch sections 8 to 10 inches long and 2 inches in diameter are ideal. The branches chosen should have brown needles that are still attached. These are the areas of the tree most likely to be infested. As a note, trees with pine wilt usually have very little sap flow, so the wood seems dry. In addition, the blue stain fungus quickly moves into wood of infested trees. For more information on pine wilt, consult *Report on Plant Disease,* no. 1104, "Pine Wilt Disease," available on the Web at http://www.ag.uiuc.edu/%7Evista/horticul.htm, or in most Extension offices. Information on submitting samples to the Plant Clinic can be found at http://plantclinic.cropsci.uiuc.edu/. *(Nancy Pataky)*

Fire Blight or Frost

Fire blight is a disease caused by a bacterium, *Erwinia amylovora*. It appears in the spring as rapid death of stem tips, often with a shepherd's-crook, scorching of leaves, and a canker at the base of the affected stem area. Common hosts include crabapple, edible apple, pear, cotoneaster, hawthorn, mountain ash, spirea, and pyracantha (firethorn).

Each spring, the cankers from the previous year's infection exude an amber, sappy-looking mass of bacteria. Insects and splashing rain move the bacterium to blossoms and branches. Blossoms are the most likely site of infection. Tender new growth may also be infected, as may any stem tissue that has been wounded (such as by insects, hail, or pruning). Fire blight is usually most severe in the spring when above normal temperatures and frequent rains occur simultaneously.

Fire blight causes the entire stem tip to die, with a distinct separation of the affected and healthy tissue. Pear foliage and stems turn black, whereas apple foliage and stems turn brown. Fire blight may continue to spread down the stem and usually ends in a dark, sunken canker at the base of the affected tissue.

Frost damage has been common this spring. Plants began to break buds early in March and April, and

succulent growth followed. A sudden temperature drop (in some areas below freezing) killed much of the newly expanding tissue. Damage was sudden, appearing over night. Sometimes only the newest growth was affected. Many plants exhibited blackened new growth that remained (and may still remain) attached to the plants. More recently, new growth has emerged from the same stems. In most cases, the stem tissue was not killed. Adventitious buds have since developed, and many plants are recovering.

Fire blight and frost symptoms often appear similar and may be difficult to distinguish. First look at the host involved. Fire blight affects only plants in the rosaceae family. Check the University of Illinois fact sheet on fire blight at http://www.ag.uiuc.edu/%7Evista/horticul.htm for a list of susceptible plants to help you eliminate fire blight as a possibility. Next, look at other plants in the area. Frost is not selective. It affects any of the deciduous plants in the same type of site exposure. If the spirea in your front yard is frosted, other nearby deciduous plants should also show some leaf, bud, or stem injury. Look specifically at plants that are not hosts of fire blight. Finally, cut into some stem tissue to determine whether only leaves are affected (more typical of frost) or stem tissue is discolored (more typical of fire blight).

If you are still in doubt, send a sample to a plant lab such as the University of Illinois Plant Clinic (http://plantclinic.cropsci.uiuc.edu/). Stem terminals from the affected tips down to an inch into healthy tissue would be ideal. Quick ooze tests with a microscope can confirm the presence of a bacterium. Further culturing is used to confirm the presence of the fire blight organism. As a precaution, always dip shears in disinfectant between cuts when taking these samples. *(Nancy Pataky)*

Focusing on Images

The U of I has a Plant Clinic where physical plant material can be sent for diagnosis and management recommendations (http://plantclinic.cropsci.uiuc.edu/). Extension offices also offer a distance digital diagnostic service, taking images of plant problems and sending the images to specialists throughout the state for comment.

An image *may* tell the whole story, such as an insect or weed identification, some obvious diseases, or possibly a case of improper plant placement. Still, it is often necessary to work with a physical sample to look for fruiting bodies, spores, or bacterial exudate, or to culture for pathogens that might not be visible by the naked eye or with a microscope. Even insect identification may require some manipulation with the physical insect.

The ideal case for accurate diagnosis would be to receive a physical sample along with supporting images. If you have a plant problem that you are sending to the Plant Clinic, send images with the sample. Here are few tips to follow.

Focus and lighting are the two most frequent image problems. Take the time to get the picture in focus. That seems fairly rudimentary, but we receive many blurred images. If they are blurred, don't send them. Hold the camera still and squeeze the shutter release button rather than moving the whole camera as you push the button to take a picture. Always have the sun or major source of lighting behind you. When the light source comes from behind the subject, the image is dark, looks like a shadow, and masks details needed for diagnosis.

How do you know what pictures to take if you don't know the cause of the problem? Try to use the pictures to show the diagnostician the complete problem. We will try to determine the cause. Three good pictures are usually all that are needed. Pictures should show (1) the overall pattern in the landscape, (2) the pattern on one plant, and (3) a close-up of the symptoms. Please don't send more pictures because these take a long time to download and generally don't add much information.

Imagine that you have no idea of the cause of the problem. Be the eyes for the diagnostician. Stand back and get a picture of the entire lawn or garden. This shows the diagnostician the condition of nearby plants, overall damage, possible site problems, and many features you might not think to mention or describe.

Next, move closer and take a picture of the entire plant, from the soil line to the top of the plant. For trees, it is important to see how the trunk enters the soil, tree shape and branching pattern, and the pattern of injury. Pull back foliage from around the base of the plant, and take a picture of the base of the plant as it enters the soil.

Finally, take an image of the insects, spots, blights, lesions, odd coloring, or whatever particular problem you see. In a few cases, it helps to put the insect or lesion under a microscope to see insect parts or fruiting bodies of fungi. Extension offices are set up to take digital images through dissecting microscopes for more detailed diagnostic work. Often, however, it is not necessary to show that much detail. Although pictures are not necessary to obtain a plant problem diagnosis, they certainly add to accuracy. If nothing else, pictures convey the extent of the problem. Don't forget to include the data form and supporting document as well, as you would without the images. *(Nancy Pataky)*

INSECTS

Scouting Watch

European pine sawfly larvae continue to be common throughout the state. These greenish larvae with dark green stripes and black heads occur in groups on the tips of scotch, mugo, and other pines. They can be removed by hand, pruned off, or sprayed with many chemical insecticides. Although they look similar to caterpillars, they are wasp larvae and not controlled with *Bacillus thuringiensis kurstaki*.

Alder leafminers, hawthorn leafminers, and **columbine leafminers** have been found as small, young, white mines in northern Illinois. As long as the mines are still small and white, removing and destroying the leaves reduce the amount of damage later in the season caused by subsequent generations. These leafminers typically do not cause enough damage to affect the health of the plant. For that reason, insecticide applications are usually not recommended.

Viburnum crown borer adult males are being caught in pheromone traps in northern Illinois. Application of permethrin (Astro) is recommended to the stems and base of the plants 1 week after peak adult male catch.

Rose slug is being found on roses. This is not a true slug but is a sawfly larva. Both the rose slug and bristly rose slug cause window-feeding and skeletonization on rose leaflets. Damage is commonly severe enough to remove half or more of the foliage. Older larvae do not have the slime coating of the young larvae, appearing more like caterpillars than slugs. As with European pine sawfly, this is not a true caterpillar and is not controlled with Btk. Carbaryl (Sevin), permethrin (Astro), and other pyrethroid insecticides are effective against this wasplike insect. *(Phil Nixon and Morton Arboretum)*

Euonymus Caterpillar

Euonymus caterpillars are numerous in northeastern Illinois. This insect rarely occurs in Illinois south of Kankakee or west of Rockford. Its main host in Illinois is European euonymus, *Euonymus europaea*. It is listed as also attacking spreading euonymus, *E. kiautschovicus,* and winged euonymus, *E. alatus;* but I have not received reports of it feeding on those hosts. European euonymus is a slender, large shrub to small tree.

Euonymus caterpillar lives in a colonial silk tent that the caterpillars web between leaves. As the caterpillars grow, they expand the web to cover more leaves and branches. The caterpillars are whitish, with two rows of large black dots. When full grown, they are slightly over 3/4 inch long. The caterpillars pupate in the silt tent in June, forming rows of vertical silk cocoons.

Moths emerge and lay eggs on the twigs and branches and in bud axils in July. The slender moths have white wings peppered with small black spots. They are relatively small, with a wingspan of 1 inch. Within a few weeks, their eggs hatch into caterpillars, which crawl under their empty eggshells to spend the fall and winter. The caterpillars become active feeders and silk-tent constructors as the leaves emerge in the spring.

A wide range of insecticides are effective, but sprays must be applied with enough pressure to penetrate the silk webbing to reach the caterpillars. *Bacillus thuringiensis kurstaki* (Dipel, Thuricide) is the insecticide of choice, due to its specificity on caterpillars. *(Phil Nixon and James Schuster)*

Periodical Cicada

We are receiving reports of periodical cicadas emerging in northern Illinois during the week of May 20. Detailed reports are of hundreds of nymphal exuviae (skins) and wings on the ground in scattered locations. These early-emerging cicadas, even though there may be hundreds, are easy prey for birds and other predators, accounting for the detached wings being found. We expect full emergence to occur over the observed Memorial Day Weekend, so they should be out by the time this issue is received during the last week of May.

This northern Illinois periodical cicada brood emergence will be north of a line from the junction of Iroquois and Kankakee counties on the eastern edge of Illinois southwest to north Sangamon County and northwest to the Rock Island area. The emergence extends into eastern Iowa and north into Wisconsin to a line extending east from the north edge of Iowa.

Both sexes of cicadas will be present for 2 to 3 weeks, with the males dying by mid-June. Only the males sing, so that will stop by that time. While the males are singing is a good time to check your clientele areas to determine whether small trees need to be protected. Periodical cicadas expand their range by only about one-half mile at each emergence; and egg-laying is heavier where the cicadas are more numerous, that is, where the male singing is louder. Based on previous experience, egg-laying will be heavy within 1/8 mile of heavy infestations and dwindle to almost nothing 1/2 mile away.

Although a few eggs will be laid before the males die, most egg-laying occurs from mid-June through mid- to late July. As a result, while the males are singing is the best time to protect young trees from egg-laying damage. The female cicadas use ovipositors (egg-laying devices) to slit twigs and insert eggs. Most attacked twigs are about 1/4 inch (pencil-sized) in diameter, but eggs can be laid in branches up to about 2-1/2 inches in diameter. This egg-laying damage weakens the stems, making them susceptible to breaking by high winds. Broken branches will be replaced by new branches, but broken trunks will not. Broken stems of shrubs will be replaced by the root system.

Protect trunks of young trees with cheesecloth, shade cloth, nylon screening, or other flexible mesh that keeps the female cicadas from laying eggs. This protection should extend from the soil line to the first branches. Tie it at the top and bottom to keep cicadas from getting under the mesh. Ties along the trunk may also be needed if there are openings where cicadas could enter.

Insecticide application is not recommended. Although pyrethroid and other insecticides kill large numbers of periodical cicadas, research has shown that they have little effect on the amount of egg-laying and subsequent tree damage. *(Phil Nixon and James Schuster)*

CHEMICALS

Household Products Database

On the heels of my recent article, "Disposing of Household Hazardous Waste," I'll share with you a related database I recently discovered. The *Household Products Database,* at http://householdproducts.nlm.nih.gov/index.htm, contains a wealth of health and safety information about the chemicals under your sink and in your garage. This free database was created by the National Institutes of Health and the National Library of Medicine Special Information Services. One of the nine categories featured among auto products and home maintenance is pesticides.

Of course, the best source of information about a pesticide is the product label. However, further health and safety information can be found on the product's MSDS, the Material Safety Data Sheets, which are available by request from the manufacturer. This database combines information from both of these resources and puts it into a searchable format. Manufacturers are always changing formulations, and as a result labels do change. This database is updated at least twice a year. With so many products available, not everything is included in the database. However, there are more than 7,000 brands included, which is impressive. According to the site's FAQ page, "Products included in the database are selected by market share and shelf presence in retail stores." The bulk of the pesticides included are products for homeowners, but some are professional use.

Ever wonder what the chronic health effects are from applying a certain garden weed preventer or what preexisting medical conditions may be aggravated by handling or applying the product? You can learn this information and much more using the database. It is worth mentioning that the LD50's that are given on the MSDS and the signal words that are stated on the label are not listed in the database. Instead, they use what they call an HMIS Health Rating which is "based on the toxicity of chemicals contained in a specific brand and its ability to cause skin and eye irritation". The scale focuses on acute exposures: 0 = minimal; 1 = slight; 2 = moderate; 3 = serious; 4 = severe; N = no information provided by manufacturer. The addition of an asterisk (*) after the number indicates that exposure to chemicals in the specific brand could also pose a chronic hazard (such as emphysema or kidney damage).

Another interesting feature of the database is that one can search by health effects. For example, suppose that you were exposed to a pesticide application your neighbor just made and now your head hurts. You could search the database for "headache." Unfortunately, the numerous results may not help your headache, as 62 records were found when I did the search. Learning about a mystery rash may be a little easier. There were only 12 products that popped up when I typed in the term "rash." But you get the idea. It would be best to simply ask your neighbor what pesticide he applied, and then you can research the product. *(Michelle Wiesbrook)*

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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