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PLANT DISEASES

Oozing Trees

Nearly a month ago, I looked out the window at my favorite pagoda dogwood to see a wet trail seeping from the trunk. I thought this was merely the pattern of drying from a recent rain. Several days later, the seeping continued and convinced me that the tree must have a canker disease and that it might decline this season. Unfortunately, pagoda dogwoods in our area usually do become infected with canker fungi, which starts the mortality spiral leading to death. I spoke to several specialists about this seeping and found an interesting article in the Morton Arboretum newsletter, *The Plant Health Care Report*, **http://www.mortonarb.org/plantinfo/index.htm.** My tree may have a canker problem, but I was relieved to know that other apparently healthy trees were showing the same phenomenon.

According to *The Plant Health Care* Report, George Ware, a well-known and respected dendrologist, explains that the xylem in thin-barked trees heats up quickly, sometimes causing sap to be exuded from weak or injured areas in a tree in late winter or early spring. The seeping I observed coincided with record-high temperatures, so I suspect that Ware's description is correct for my tree. If you see similar symptoms on your thin-barked trees, do not panic. This is most likely a harmless occurrence. Still, you might want to pamper such trees to help them thrive this year.

Although similar, this condition is not bacterial wetwood or slime flux. I did not see any oozing in the known wetwood-infected trees in our area. For information on wetwood, consult *Report on Plant Disease*, no. 656, "Bacterial Wetwood and Slime Flux of Landscape Trees," available on the Extension VISTA Web site or in local Extension offices. *(Nancy Pataky)*

Choose Disease Resistance

As this season progresses, we will be confronted with many plant disease problems. Some will be harmless, some a nuisance, and some quite devastating. If we could choose a preferred method of disease control, it would be resistance. Of course, that is not always possible.

Disease resistance is the capacity of a plant to lessen the harmful effects of a pathogen. We see fewer disease symptoms on plants with some level of resistance. Resistance is an inherited trait. It seems most useful in preventing diseases such as rust, powdery mildew, vascular wilts, and scab; but there are available varieties resistant against many other diseases.

If a pathogen is able to cause only a small amount of disease on a plant, that plant is *resistant.* If the pathogen causes a large amount of disease, the host is *susceptible.* Resistance is a continuum from mild disease to severe disease, with all levels in between.

In terms of disease-control options, resistance is preferred over other methods because it

- Reduces expense (no labor or chemical costs)
- Eliminates inconvenience of other disease-control activities, such as pruning
- Eliminates side effects, such as impact of chemicals on the environment
- May be the only disease-control option, as may be the case with Verticillium wilt or crown gall diseases

Disease resistance may be rated in many ways. There is no uniform rating scale. The usual scales are numerical or ordinal. Many companies that rate their plants for resistance level use a 1-to-9 scale, with 1 indicating most susceptible and 9 most resistant. Beware, however, that other companies use a 9-to-1 scale or other variation. Ordinal scales include ratings using words such as high, medium, or low disease resistance. Word scales are easy to understand but are not always as precise as numerical ratings. *HR* for highly resistant, *R* for resistant, *MR* for moderately resistant, *MS* for moderately susceptible, and *S* for susceptible are commonly used. When using resistant plant material, look for the rating provided by the seller, but also look for an explanation of the scale.

Where do we find disease-resistance information? There is no one central location. It can be found in a variety of places, some highly visible and some difficult to find. Web searches have made this information more available. Some sources to try include university publications; botanic garden trials; breeding and selection programs, such as the U.S. National

Arboretum, land-grant universities, and the private sector; plant societies, such as the hosta society.

There are also textbooks and other publications that list resistance information. Some of this information will last for many years; and some will be short-lived, as new pathogen races develop. An excellent book that discusses available disease-resistant cultivars is *Diseases of Woody Ornamentals & Trees in Nurseries*, by APS Press, St. Paul, MN. Some journals and newsletters that discuss current resistance information include *California Agriculture, Greenhouse Grower, Mycologist, Plant Disease*, and the *Ohio Florists Association Bulletin*. Always be open to these and other sources of information. The U of I *Report on Plant Disease* series provides a starting point.

Who sells resistant plant material? Identifying the resistant plants is useless if the plants are not available. Often it is best to start with operators of local garden centers that know the disease problems in an area and try to find sources of resistance in locally adapted plants. A program called Chicagoland Grows, Inc., evaluates plants that do well in northern Illinois and provides a list of retail businesses that sell them. The Center for Development of Hardy Landscape Plants provides similar information in Minnesota. Undoubtedly, there are other such sources.

Try to find disease-resistant varieties in the plants you purchase this spring, especially for areas where you had problems in the past. As an example, there are many varieties of phlox with powdery mildew resistance. Some tomatoes have resistance to *Verticillium* and *Fusarium* infection. Most new crabapples are resistant to scab. There are hundreds of other examples, so look into disease resistance now, before you purchase or plant. *(Nancy Pataky)*

Daylily Problems

A few growers have complained of water-soaked tips to daylily leaves. We are all a bit concerned about the threat of daylily rust, but that disease starts as yellow flecks scattered on the leaves, followed by rust pustules. In addition, the specific requirements for daylily rust spores to germinate and infect are not known, but it is too early in the season for rust in Illinois. Even if the fungus were able to overwinter in Illinois, conditions have not yet been conducive for infection.

It is likely that the water-soaked tips of leaves are symptoms of frost injury or at least cold injury. Such environmental injury may affect all daylilies or a group of similarly exposed plants. Keep the plants watered in drought, and they should recover nicely. For details on daylily rust, refer to articles in the past 2 years of this newsletter. *(Nancy Pataky)*

Boxwood Injury

Boxwood plants are often susceptible to winter injury in central and northern Illinois; and this injury has been evident already in 2003. Most boxwood species are hardy in zones 5 to 6, but some cultivar selections have been developed to tolerate colder temperatures fof zone 4. Sensitive boxwoods suffer winter injury if planted out of their natural zones. Even those in the correct zone sometimes show winter injury.

Winter injury causes bronze to reddish brown foliage, especially on parts of the plant exposed to winter winds or winter sun. In addition, temperature extremes cause splits in the bark, and entire branches may die to the crown of the plant. Look for injury now and prune out any dead wood.

Volutella (syn. Psuedonectria) blight can be confused with winter-injury symptoms. In fact, the fungus often infects wounds from winter injury. Volutella blight is a fungal disease that infects leaves at the tips of stems. The leaves are reddish to bronze, and stem tips may die. *Volutella* moves down the stem, whereas winter injury happens seemingly at once and does not progress down the stem. If affected foliage is placed in a plastic bag with damp paper toweling (moisture chamber) for 24 hours, the salmon pink fruiting bodies of *Volutella* will clinch the diagnosis. Prune out dead wood and thin the plant to allow better air circulation, which discourages fungal growth.

Boxwoods have fairly shallow roots. Cultivating around them or over-applying fertilizer may injure or kill roots, also resulting in top dieback and plant decline. It is suggested that boxwoods be mulched, but not too deeply. Two problems could result from thick mulch. Roots grow into the mulch and become susceptible to drought stress when the mulch dries; voles are known to live in mulch and feed on the trunk of this plant. For these reasons, keep mulch shallow and away from the trunk. *(Nancy Pataky)*

INSECTS

Pine Needle Scale

In many parts of Illinois, it is time to treat for pine needle scale, *Chionaspis pinifoliae*. Generally, egg hatch occurs when Vanhoutte spirea is in bloom. The young crawlers, which move around on the plant, are susceptible to insecticide applications. Mugo, Austrian, Scots, and red pines are most susceptible to attack by pine needle scale.

Mature pine needle scales are small (about 2 to 3 millimeters long), elongated, white scales on the needles of evergreens. The eggs overwinter underneath the mated adult female scale cover. Females lay

up to 100 eggs. The eggs hatch into crawlers from late April to June. The crawlers move around on the plant foliage before finding a place to settle and feed. They extract plant juices from the mesophyll layer of needles, which causes the needles to turn yellow, then brown. Whole branches may be killed; heavy scale infestations can kill entire trees. The young crawlers may be blown onto other plants by wind. There are two generations per year in Illinois.

Pine needle scale management involves maintaining plant health and using insecticides. Properly implementing cultural practices—including irrigation, fertility, and mulching—minimizes stress and allows plants to tolerate low to moderate populations without suffering injury. Insecticides recommended include acephate (Orthene), insecticidal soap, and summer oil. These materials are applied when Vanhoutte spirea is in bloom. Second-generation crawlers can be treated as hills-of-snow hydrangea blooms turn from white to green. Repeat spray applications 7 to 10 days later because the second-generation eggs hatch over a longer period. Be careful when applying summer oil, as it may discolor foliage. *(Raymond A. Cloyd)*

Emerald Ash Borer

Emerald ash borer is a new insect from China. Arborists, landscapers, and other horticulturists should be watchful for this pest and its damage. Recent newspaper accounts have increased the public's interest in the emerald ash borer.

Emerald ash borer was detected in southeast Michigan in 2002. It has also been detected in Windsor, Ontario, and was discovered in Toledo during the winter. It is originally from Asia. In the United States, it is known to attack only white, black, and green ashes.

Adults are slender, dark metallic green, 1/2-inch beetles that are present from mid-May to late July. The creamy white larvae are found under the bark.

Infestation results in severe dieback of the upper third of the canopy, with the tree being killed in 2 years. The adult beetles make a D-shaped exit hole when they emerge. Tissue produced by the tree in response to larval feeding may cause vertical splits to occur in the bark. Distinct S-shaped tunnels may also be apparent under the bark.

Because this pest is highly destructive, the Michigan Department of Agriculture placed a quarantine on all ash trees and ash wood products, including firewood, in the affected counties to prevent and control its spread. If this beetle is detected, contact the Illinois Department of Agriculture or your local University of Illinois Extension Office. *(Nancy Pataky)*

Iris Borer

Iris borer tunnels into the rhizomes of iris, causing dieback of the plants. Moths emerge and lay their eggs in the spring on the developing iris fans. The hatching larvae tunnel into the leaves and live as leafminers, causing brown, water-soaked-appearing streaks down the leaves. Once the caterpillars mine to the base of the leaves, they enter the rhizome. Tunneling in the rhizome increases the likelihood of rot in the rhizome. Both the borer and the rotting contribute to the potential decline and death of the iris.

Tall bearded iris is very susceptible to iris borer, but its large rhizomes allow it to survive attack; it may still grow and flower with moderate infestation. Many varieties with small rhizomes, such as Siberian, Louisiana, and Japanese irises, are much less likely to be attacked; however, even small infestations severely harm or kill these small-rhizome varieties.

Many growers successfully dig up the rhizomes in mid- to late summer, remove the borers, and replant the rhizomes. Other growers do not have much success with this method.

Iris borers are most susceptible to insecticides when traveling down the leaves as leafminers. When the fans are about 6 inches high, applying a systemic insecticide such as acephate (sold as Orthene) or spinosad (Conserve) is effective. *(Phil Nixon)*

Insect Development and Plant Phenology

Insects and plants are influenced by environmental conditions, including temperature, moisture, and day length. Temperature has a major impact, as both insects and plants develop faster as temperature increases and more slowly as temperature decreases. Knowing the influence of temperature can be useful in successfully managing insect pests. The key factors involved are growing degree-days (GDD) and plant phenology, which can be used to properly time scouting practices, placement of pheromone traps, and insecticide applications at the most susceptible life stage of many plant-feeding insects. These practices can lead to fewer insecticide applications and thus preserve existing natural enemies.

Growing degree-days accumulate when the average high temperature is greater than the base temperature of 50°F because insect growth and activity is reduced below this temperature. The formula for GDD involves adding the maximum and minimum daily temperatures, dividing by two, and then subtracting the base temperature of 50°F. This results in the GDD for a particular day. For example, if for a given day the high is 75°F and the low is 60°F, then the average is 67.5°F. Subtracting the baseline temperature of

50°F results in 17.5 GDD. If the average temperature is less than 50°F, then the GDD is 0. Growing degree-days accumulate over the year, determining the appearance and development of insects. Forecasting models based on GDD have been developed for many landscape insects pests, including the elm leaf beetle, bronze birch borer, flatheaded appletree borer, dogwood borer, lilac/ash borer, Nantucket pine tip moth, bagworm, and pine needle scale. GDDs vary from one location to another due to microclimates.

Plant phenology is used to estimate pest emergence based on the synchronization of plant growth stages (that is, bud swell, leaf emergence, flowering, and/or fruiting). Plants used for phenological observations are often called indicator plants. Indicator plants need to be common to a wide geographical area and easy to grow and recognize. The flowering of a certain plant species indicates when the most susceptible life stage of many insects is present. Following are insects and certain stages that are present during the blooming cycle of Vanhoutte spirea *(Spiraea x vanhouttei):*

Full bloom: Birch leafminer young larvae, elm leaf beetle young larvae, European pine sawfly feeding larvae, gypsy moth feeding larvae, pine needle scale crawlers (first generation)

Full to late bloom: Lilac/ash borer newly hatched larvae, oystershell scale (brown) crawlers

Finishing bloom: Bronze birch borer newly hatched larvae

Most blossoms brown, a few still white: Flatheaded appletree borer larval hatch; peach tree borer newly hatched larvae; viburnum borer newly hatched larvae

Finished bloom: Oystershell scale (gray) crawlers

Predicting the stage of insect development based on the flowering of particular plant species is well documented in the book *Coincide* by Donald A. Orton, a retired Illinois Department of Agriculture nursery inspector. This book is published by Labor of Love Conservatory, 468 South President, Suite 103, Carol Stream, IL 60188-2894; phone, (630)668-8597. *(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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