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PLANT DISEASES

Disease Information Tidbits

Bacterial leaf scorch (BLS) is a devastating disease that has been shown to infect pin, bur, white, and shingle oaks in at least two areas of Illinois. The disease is discussed in issues no. 13 and 18 of this newsletter. One tidbit of information that was not mentioned in earlier issues is the theory that oak trees under drought stress show more damage from bacterial leaf scorch. If you are concerned about the threat of BLS to your oaks, consider supplying water regularly to your trees to encourage plant health. Research has shown that Virginia creeper plants infected with BLS showed more damage when under drought stress (article in *Plant Disease*, 85:1160-1164). This fact, along with field observations of the same tendency on oaks in Kentucky, suggests watering regularly may help oak tree health, which may help slow disease spread.

Foliar nematodes were confirmed in Illinois on hosta this season. This is not the first report for Illinois, but occurrences are still rather rare. These nematodes were discussed in issue no. 15. If you have hostas with symptoms of this nematode, try to get the problem confirmed and then remove plants if other hostas are nearby. The nematodes will live in the leaves until the foliage breaks down in the fall. As leaves drop and degrade, the nematode will move into the soil. At the very least, if you have suspect plants, remove old hosta foliage now, before the nematodes move into the soil to overwinter.

Phytoplasmas are not all bad. They are pathogens that can cause diseases such as ash yellows, aster yellows, and elm yellows (phloem necrosis). Phytoplasmas cannot be cultured on artificial media, making them more difficult to confirm in conventional labs. They can be extracted from the phloem tissues in which they reside and purified, and serological techniques have been developed for their identification. Such tests can be done by labs with capabilities to do these specialized techniques, but usually the cost is more than that of standard sample diagnosis. An interesting tidbit of information about phytoplasmas is that they are not always undesirable. Naturally grown poinsettias will become trees reaching 10 feet in height. Poinsettia growers strive to develop plants with a dwarfed, moderate branching growth habit for potted plants. Research initiated in 1995 has shown that the free-branching commercial poinsettia cultivars are actually infected with a phytoplasma that conveys these desirable traits. While free branching is actually a disease symptom in poinsettia, it is not harmful to the poinsettia and is very beneficial to the grower. *(Nancy Pataky)*

Verticillium or Look-Alike?

We saw a fair number of positive *Verticillium* cases at the Plant Clinic in 2003. A sample is considered positive when the *Verticillium* fungus is actually isolated from the plant sample in the lab. There is no doubt that Verticillium wilt continues to be a relatively common problem among shade trees such as maple, ash, catalpa, magnolia, redbud, and fragrant sumac. However, it is important to remember that the basic "Vert" symptoms such as wilted, yellowed, scorched or dead leaves; early fall color; dieback; and even discolored vascular tissue can indicate a number of different plant problems. These problems might include root rot, cankers, deep planting, girdling (encircling) roots, damaged branches or roots, poor soil-water drainage, and drought stress. All too frequently, *Verticillium* is blamed because that is the easy out. It might be interesting to note that of 55 woody samples submitted to the Plant Clinic for *Verticillium* culturing this summer, only 12 tested positive. The only way to prove the symptoms are due to Verticillium wilt is to culture for the fungus (see issue no. 6 of this newsletter for details). Laboratory culturing is reliable in identifying the presence of the *Verticillium* fungus, but only if the tissue is alive and vascular streaking is present. In many cases, woody tissue exhibiting vascular discoloration was not submitted. The fungus is not uniformly distributed throughout the plant; and it is most likely to be recovered from areas of vascular streaking.

To some, it may not matter why the tree is dying. In fact, however, we can often learn something from the dying tree. Root collar excavation work by Gary Johnson at the University of Minnesota showed that

many trees diagnosed with Verticillium wilt were often misdiagnosed. In many cases, the trees were actually declining or dying from a problem that is preventable—deep planting and girdling roots. Keep in mind that even if Verticillium wilt is positively identified in the tree, you should investigate the site for stress factors that may have predisposed the roots to infection. Trees that have been planted too deeply or that have girdling roots may exhibit canopy symptoms such as early fall color, thin canopy, or reduced annual twig growth. In addition, the trunk may be leaning, have no noticeable flare roots, or have one or more flat sides at the base. Dr. Johnson has observed Littleleaf Linden 'Greenspire' to be one of the more problematic trees with these problems, although Norway maple and members of the *Prunus* genus are commonly affected as well. Deep planting has been observed on clinic samples on ash, maple, and even spruce.

When you plant a new tree or shrub, first locate the main root/trunk junction. The first root should be buried just below the soil line. When you get your tree or shrub for planting, loosen the burlap or root ball covering and carefully probe near the trunk to find the first large root. You may find that you will need to remove some soil (sometimes several inches) from the top of the root ball before figuring the depth of the hole and placing the plant. Do this carefully so as not to injure the trunk or the roots. This process should help prevent later problems associated with deep planting.

The *Verticillium* fungus lives for many years in the soil. If the fungus is confirmed in the plant sample, it is also present in the soil. Only plants with resistance to Verticillium wilt should be planted in infested sites. This is another benefit to knowing the cause of tree decline.

When making a statement that a plant is infected with Verticillium wilt, be certain that symptoms fit, vascular streaking is present, and other site, environmental, and mechanical possibilities have not been overlooked. For details about Verticillium wilt, refer to *Report on Plant Disease*, no. 1010, available in Extension offices or on the Vista Web site, which you can locate under links of interest on the Plant Clinic Web site: **http://plantclinic.cropsci.uiuc.edu/.** *(Nancy Pataky)*

Rose Cankers

Rose cankers appear any time of year but especially when the plants are under stress. Three canker diseases (brown canker, stem or common canker, and brand canker) are common in Illinois and are generally confused with weather injury or other problems. Cane infections may approach 100 percent (all canes infected) where control measures are not practiced. Identifying particular canker species is not important, but it is important to identify a problem as a canker. The first symptoms are small, roundish lesions in the canes; the spots are pale yellow, reddish, or bluish purple. They gradually enlarge, turn brown or grayish white (often with a darker margin), and may partially or completely girdle the cane. Complete girdling results in dieback or poor growth of the plant parts above the affected areas. Cankered areas are sprinkled with black, speck-sized, fungus-fruiting bodies. When left unchecked, infections may spread downward into the crown, causing entire rose plants to wilt, wither, and die. Infection occurs chiefly through a wide variety of wounds, including thorn abrasions. Infections may also occur on the leaves and flowers.

Management of rose cankers starts with good sanitation. Prune the canes now and in early spring according to the type and cultivar grown. For example, it is important to leave shrub rose stems intact as long as possible, deferring pruning until spring. Remove and burn or haul away with the trash all infected, dead, and weak parts of canes, as well as infected leaves, flowers, buds, and hips. When pruning cankerous stems, cut back to a strongly growing shoot or branch at least 2 to 3 inches below any sign of infection. Some suggest that pruners be disinfected between cuts, but that can be quite time consuming and possibly unnecessary. Prune in dry weather and disinfect pruners at least between plants. Use sharp tools to make clean, slanting pruning cuts no more than 1/4 inch above a node.

New plants should be only top-quality, disease-free plants from a reputable nursery. The plants should be free of cane bruises or colored spots. Bargain roses are often infected when purchased. Maintain plants in high vigor by proper planting, spacing, fertilizing, watering, winter protection, and thorough spraying with fungicides. Start as the buds break open in the spring and continue at 7- to 10-day intervals into September or early October. The fungicides that control black spot usually control cankers as well, so no additional spraying is required. Adding a spreader–sticker material to the spray helps wet the canes for better protection. Consult *Report on Plant Disease*, no. 626, "Rose Cane Cankers," for details. This report is available in Extension offices or on the Vista Web site, accessible through the Plant Clinic site, **http://plantclinic.cropsci.uiuc.edu/.** *(Nancy Pataky)*

INSECTS

Periodical Cicada

There have been queries as to whether periodical cicadas will be numerous in Illinois next year. Brood X, the Great Eastern Brood, is a major 17-year cicada brood that is expected to emerge next spring. It occurs over much of the eastern United States but in Illinois gets into only Iroquois, Vermilion, and Edgar counties in the east-central portion of the state. Most of the area of these counties will be affected, as well as a narrow band just north of I-74 extending about half-way across Champaign County from the east.

Expect a large number of news reports on this insect next spring because the Great Eastern Brood occurs in Washington, D.C., and in New Jersey, close to New York City. With the high concentration of news reporters in these two cities, many stories are likely to be produced. If the news reports are like they were in 1987, they will make it sound like cicadas are coming out all over the United States, and there will be numerous calls to Illinois arborists and landscapers.

The next major cicada emergence in Illinois will be Brood XIII, the northern Illinois brood, which will cover much of the northern half of Illinois in 2007. The relatively small emergence of periodical cicadas in northeastern Illinois in spring 2003 was a portion of this brood that emerged after 13 years in 1969 and has been emerging every 17 years since that time.

Periodical cicadas have a major impact on small, newly planted trees. They lay eggs into the trunk, causing it to weaken and snap off. We recommend the avoidance of major tree planting during the year before a major emergence. If practical, delay planting trees this fall and next spring in Iroquois, Vermilion, and Edgar counties in areas where there are established trees that had the cicadas in 1987. New housing developments on agricultural land or other treeless areas are unlikely to have serious cicada problems. Similarly, if all of the shrubs and trees were removed before houses were built, any cicada nymphs in the soil would have starved to death when the trees and shrubs were removed, so those areas will also not have cicada problems. *(Phil Nixon)*

Why Use Dormant Oils?

Insect and mite pests normally survive the winter months in an overwintering stage such as an egg or a mature female that emerges in the spring. Instead of waiting until spring to initiate control measures, making an application of dormant oil may be beneficial. The advantages of using a dormant oil are (1) a wide range of activity against most species of mites and scales, including activity on eggs; (2) minimal likelihood of insects' or mites' developing resistance; (3) a tendency to be less harmful to beneficial insects and predatory mites (= natural enemies) than other pest-control materials with long residual activity; and (4) relatively safe to birds, humans, and other mammals. The disadvantages of using a dormant oil are (1) potential phytotoxicity during the growing season and (2) minimal residual activity or less persistence.

Dormant oils, which are derived from paraffinic crude oil, are the heaviest of the petroleum oil sprays and have a low unsulfonated residue (UR). Unsulfonated residue is a measure of phytotoxic compounds remaining after distillation and refining. A high UR (greater than 92%) indicates a highly refined product with less probability of phytotoxicity. Dormant oils have a UR value below 92%.

Applications of dormant oils are directed primarily at killing overwintering pests, including mites and scales, before they can become active in the spring and cause plant injury. Applications are made in winter to minimize phytotoxicity to plants. Usually a 2 to 4% rate is used in the late fall to early spring. Dormant oils either suffocate, by blocking the breathing pores (spiracles), or penetrate and destroy cells of exposed insects or mites. Oils are contact materials with mini-mal residual activity once the material has dried, so thorough coverage is essential.

Dormant oil sprays are generally applied to plant parts, which means that the pest's overwintering stage is located on the plant. However, not all insect and mite pests overwinter on plants. For example, dormant oil applications are not effective on twospotted spider mite, *Tetranychus urticae*, because the mite overwinters as a female in plant debris, mulch, or other nonplant protected places. In contrast, the spruce spider mite, *Oligonychus ununguis*, overwinters as an egg on plants, primarily evergreens such as arborvitae, juniper, hemlock, and pine. As a result, this mite is susceptible to dormant oil sprays.

Dormant oils are highly effective in killing the overwintering stages of scales, particularly first- and second-instar nymphs (for example, cottony maple scale, *Pulvinaria innumerabilis)*. Euonymus scale, *Unaspis euonymi*, overwinters as a second instar or mature female and is relatively easy to control with dormant oil sprays. However, scales that overwinter as eggs, such as oystershell scale, *Lepidosaphes ulmi*, and pine needle scale, *Chionaspis pinifoliae*, may be more difficult to control. The reason for this is that eggs are generally stacked on top of each other, and

the dormant oil may not contact the bottom layer. As a result, additional insecticide applications after egg hatch are generally required.

A concern with the use of dormant oils is phytotoxicity (= plant injury). Some plants, including arborvitae, beech, redbud, and certain maples (Japanese, red, sugar, and amur), are very sensitive to oil sprays. For example, the needles of Colorado blue spruce can be discolored (change from blue to green) from dormant-oil applications. Phytotoxicity is generally prevalent when higher rates (over 4%) are used and when applications are made in early fall before dormancy or in late spring at bud-break. Fewer problems occur when applications are made in late October through February, when plants are completely dormant. To minimize the potential for phytotoxicity, make sure the spray solution is continually agitated.

Dormant oils should never be applied when there is danger of freezing. Dormant oils should be applied to deciduous plants when the ambient temperature will stay above freezing for at least 24 hours. Evergreens are more susceptible to damage, so applications are safe when temperatures stay above 40°F over a 24-hour period. Additionally, dormant oils should never be applied to plants that are stressed, as they are more susceptible to phytotoxicity. Lack of moisture, extreme temperatures, sudden change in temperature after spraying, prolonged winds, or poor conditions due to disease or insect infestation predispose plants to phytotoxicity.

It is generally thought that using dormant oils is less likely to result in insect or mite populations' developing resistance. However, this may not be true. For example, a Christmas tree plantation of Scots pines was sprayed with dormant oils for more than 10 years to control pine needle scale. Eventually the scales became more and more difficult to control. It was discovered that the scale covers were thicker than normal, making it harder for the dormant oil to penetrate.

Preventive dormant oil applications can save time later in dealing with insect or mite pests. Treatments may not be needed in early spring, or the number of applications may be reduced. Reducing the number of insecticide applications preserves natural enemies of mites and scales, including parasitoids and predators, which usually supply sufficient control of these pests. *(Raymond A. Cloyd)*

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