UNIVERSITY OF ILLINOIS EXTENSION
# HOME, YARD & GARDEN PEST
College of Agricultural, Consumer and Environmental Sciences, University of Illinois at Urbana-Champaign
Illinois Natural History Survey, Champaign
NEWSLETTER

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## PLANT DISEASES

### Is My Spruce Diseased?

Over the past few months, I have received phone calls about spruce trees with brown needles. The growers are concerned that a disease is or possibly was involved. Here are a few tips to determining whether your spruce has been invaded by a pathogen or affected by other factors.

In our area of the Midwest, we usually see only two spruce diseases: Rhizosphaera needle cast and Leucostoma (Cytospora) canker. I have occasionally seen spruce needle rust in the northern counties of Illinois. We are also watching for a rather new but weak pathogen associated with spruce needle drop. That fungus is *Setomelanomma holmii.* If it is present in Illinois, it has not been identified as a major problem.

**Rhizosphaera needle cast** is a fungal disease that we usually don't notice until June, but reports from Morton Arboretum (northern Illinois) confirm its presence this year. One-year-old needles turn a purplish brown color, but the newest growth remains green. The appearance of new, green growth in mid-May helps us notice this disease. Affected branches occur in patches around the tree, usually worst at the bottom of the tree. The presence of the fungus can be confirmed by placing some of the brown/purple needles in a moisture chamber (plastic bag with moist paper toweling) overnight and observing the characteristic fruiting bodies emerging in rows down the needles the next day. These fruiting bodies, which look like black pinheads sticking out of the stomata, are indications of a fungus, *Rhizosphaera kalkhoffii,* the cause of Rhizosphaera needle cast. Tree species also helps in narrowing the cause of symptoms. Blue spruce is most often infected, while white spruce is moderately susceptible and Norway spruces are resistant to this disease. Keep in mind that there may be more than one problem on a tree. *Rhizosphaera* often accompanies other problems. For some very nice pictures of the symptoms and fruiting bodies, visit this Forest Service Web site: http://www.na.fs.fed.us/spfo/pubs/pest_al/rhizo/rhizo.pdf.

**Leucostoma (Cytospora) canker** also occurs frequently on spruce trees in Illinois, especially trees on stressful growing sites or in stressful environmental conditions. In fact, this disease is most common on stressed trees at least 15 years old. Because drought-stressed trees seem to be most susceptible, and most of Illinois was under drought conditions in 2005, we would expect to see more of this disease in 2006. Cankers are dead areas of branches or trunks. They may girdle and kill the branch, or they may only limit movement of water and nutrients. On spruce, there is usually a sappy exudate associated with the canker; but this sap is a thin layer, not the large blobs of sap associated with some insect pests such as pine shoot moths. The wood under the bark of a tree with Leucostoma canker is brown, rather than green or white. Species affected include mostly Colorado blue and Norway, but other spruce species (as well as Douglas-fir, balsam fir, hemlock, larch, and red and Eastern white pine) may have this canker disease. The symptoms start on the lowest branches and move upward, branch by branch, over a number of years. Unlike Rhizosphaera, Leucostoma causes both old and new needles to be discolored. A University of Illinois fact sheet, "Cytospora or Leucostoma Canker of Spruce, *Report on Plant Disease (RPD),* no. 604, is available on the Internet at http://www.ag.uiuc.edu/%7Evista/horticul.htm. Most Illinois Extension offices also have copies of this fact sheet. Two species of the *Chrysomyxa* rust fungus usually cause needle rust on spruce. The disease is common on black, white, and Colorado blue spruce in Minnesota and occasionally occurs on Norway spruce. It is not very common in Illinois.

**Spruce needle rust** causes yellowing of the foliage. On close inspection, needles have small, raised pustules about one-third the needle thickness. These pustules contain orange spores. Often the edges of the pustules have a white, paperlike appearance, so you may see white, paperlike structures sticking out of the needles. These structures may be as long as the needle is wide. Yellowing and sporulation does not occur until midsummer, so you probably won't mistake this disease with early-season problems. A USDA fact

sheet available at http://www.fs.fed.us/r10/spf/fhp/leaflets/Sprneerus.htm provides images of this disease and pathogen.

Plant diseases are not always the cause of spruce decline. The spruce samples that I have worked with this spring have not been infected with the above-mentioned fungal pathogens. Incubated tissue did not yield disease pathogens. Instead, **environmental stress factors** have been implicated. It is often difficult to prove environmental stress. Look at the pattern of brown needles. The noninfectious cases we have seen exhibited needle necrosis that was somewhat scattered on branches but was most intense on the south and west side of the trees. All of the spruce trees in the landscape were affected, though not necessarily in neighboring landscapes. The south and west sides are usually desiccated by sun and wind. The drought of 2005 may also have contributed to the needle necrosis. Look for live buds and green tissue in new stems as indicators that the tree is still healthy. Such trees may need supplemental water this season in periods of drought. There are many other noninfectious problems that can mimic disease. A few possibilities include an imbalance in soil pH, poor fertility, fertilizer or chemical burn, root injury, root rot, drought stress, and spider mite infestations.

If you are uncertain of your diagnosis, consult a University Extension office anytime or the Plant Clinic (http://plantclinic.cropsci.uiuc.edu/) after May 1. *(Nancy Pataky)*

### Why Shouldn't I Prune Oaks Now?

You have probably heard that it is not wise to prune oaks during the active growing season. The actual act of pruning does not harm the tree. The problem involves what you will attract to the tree—insects that may carry the oak wilt fungus. The Forest Service recommends that we halt any pruning of oak trees during April, May, and June. Others extend that ban through July. Fresh cuts in those months produce sap that attracts sap-feeding nitidulid beetles that may have visited sporulating mats of the oak wilt fungus on diseased trees. If that is the case, they bring the oak wilt fungus to your tree. If you are certain there is no oak wilt disease in your area, you do not have to follow this guideline.

Become familiar with oak wilt symptoms so that you can recognize it in your area. The most dependable symptom, present in all affected tree species, is vascular staining. Stained tissue is used to prepare test cultures in the lab. Refer to *Report on Plant Disease (RPD)*, no. 618, for pictures and details about oak wilt detection. You can obtain this report on the Web (http://www.ag.uiuc.edu/%7Evista/horticul.htm) or at local Extension offices.

Leaf symptoms vary depending on the oak species involved. Generally oaks in the red or black oak group (pointed leaf lobes) develop discolored and wilted leaves at the top of the tree or at the tips of the lateral branches in late spring and early summer. The leaves curl slightly and turn a dull pale green, bronze, or tan, starting at the margins. Usually by late summer, an infected tree has dropped all its leaves. In some years, we have seen red oaks progress from scorched foliage to total defoliation in as little as 3 weeks.

The white and bur oak group (rounded leaf lobes) generally shows symptoms on scattered branches of the crown. The disease is often confused with general dieback and decline. Leaves on infected white oaks become light brown or straw-colored from the leaf tip toward the base. The leaves curl and remain attached to the branches. This tree group may die in one season but is much more likely to survive for many years with dieback and stressed appearance.

Oak wilt is particularly threatening because there is no complete control or cure once the fungus infects. The fungus infects through fresh wounds by a beetle vector, and it can spread by root grafts between trees. The infected tree cannot be saved; but you may be able to save surrounding trees, so a positive diagnosis is important in many cases. *(Nancy Pataky)*

## INSECTS

### Scouting Watch

As saucer magnolia *(Magnolia x soulangiana)* develops into bloom, a number of insects become susceptible to control. This tree is finishing bloom in southern Illinois, is in full bloom in central Illinois, and is close to bloom in northern Illinois.

**Pales weevil and northern pine weevil** emerge at this time from stumps left from the previous year to feed on the bark of seedlings and twigs of pines, causing them to turn brown and die. Spraying stumps that were present last summer with chlorpyrifos (Lorsban, Dursban) or dimethoate (Cygon) in Christmas tree farms helps reduce the number of adults that survive. Seedlings and the foliage of older trees can also be sprayed with the same insecticides at this time to protect them. Remember to rogue out any stumps this spring so that you won't need to spray next spring. Northern pine weevil larvae live beneath the bark of dead pine trunks, and Pales weevil larvae live beneath the bark of the underground portion of dead pine

trunks. Christmas tree farms and nurseries that do not leave stumps through the summer have very few if any of these insects.

**European pine sawfly** eggs hatch as saucer magnolia drops its petals. Watch for these green-striped larvae that look like caterpillars and feed in groups on Scots, mugo, and other pines. Although they look like caterpillars, they are related to wasps. Control them with hand-removal or sprays of carbaryl (Sevin) or pyrethroids.

**Eastern tent caterpillar** hatches on crabapple, hawthorn, and other rose family trees as saucer magnolia blooms. Look for the silk tents in the twig crotches. Because eastern tent caterpillar is a true caterpillar, *Bacillus thuringiensis kurstaki* (Dipel, Thuricide), as well as other insecticides, is effective against this insect, as is hand-removal of the caterpillar-containing tents at night and on cloudy days.

**Cooley spruce gall and eastern spruce gall adelgids** on spruce are susceptible to pyrethroid sprays at this time of year before they have caused the protective galls to form around themselves. *(Phil Nixon)*

## Zimmerman Pine Moth

Can you believe it is that time of year to be cognizant of the Zimmerman pine moth *(Dioryctria zimmermani)* caterpillars, which are (this very moment) actively crawling on the bark of susceptible host trees? It is during this period that the caterpillars are exposed and susceptible to sprays of insecticides, after they have been overwintering in bark crevices inside silken webs, which are often referred to as *hibernacula.* Zimmerman pine moth is not finicky in regards to the pines it feeds on; however, it tends to prefer Scotch and Austrian pines. Young caterpillars, which are 1/16 inch long, are very difficult to detect with the naked eye. Their bodies are covered with small black spots, each containing a single bristle, and tend to be located at the base of terminal buds or under bark flakes. The caterpillars eventually tunnel into trees, creating wounds that exude masses of pitch at the branch whorls on the trunk or on shoots near the terminal leader. These pitch masses may resemble galls. Caterpillars are about ¾ inch in length when full grown. Excessive tunneling by the caterpillar can kill terminal leaders. Heavily infested terminals curve downward, resembling a fishhook. Successive trunk attacks by the caterpillars may cause the tops to break off, reducing the salability of the tree. In general, young trees are more susceptible to attack by Zimmerman pine moth caterpillars and are more attractive to adult females for egg-laying.

To successfully manage Zimmerman pine moth with insecticides, it is important to use high-volume sprays and thoroughly saturate the stem and bark, where the caterpillars are primarily located. High-volume spray applications are also better because a thick canopy of pine needles may deter sprays from reaching the trunk. Pyrethroid-based insecticides such as permethrin (Astro) are typically recommended and most effective in killing Zimmerman pine moth caterpillars this time of year. *(Raymond A. Cloyd)*

## White Pine Weevil

White pine weevil larvae tunnel through the terminals of white pine, other pines, most spruces, and occasionally firs. The center of the candle is hollowed out, causing it to bend over and form a shepherd's crook. This insect is found primarily in the northeastern United States, but it has become more common in Illinois during the last few years and is found throughout the state. Damaged terminals die and lateral buds break, causing the trees to be multi-trunked or have crooked trunks. This damage greatly reduces the quality of landscape trees, nursery plants, and Christmas trees. In areas of the northeastern United States, infestation can be so severe that the trees become bushy from all the growing lateral buds.

At this time of year, the adult weevils leave debris under the tree where they have spent the winter and climb to the terminals to lay eggs. These are hard-shelled, cylindrical, ¼-inch-long, dark brown beetles with scattered light spots and an elongated "snout." Tiny jaws at the tip of the snout chew holes into buds; the weevil lays her eggs into these holes. The resulting legless white larvae tunnel through the bud, hollowing it out as it grows into a candle, eventually killing the shoot. The larvae pupate in the shoot, emerge as adults in mid-August to late September, and burrow into the debris below the tree to spend the winter.

Spraying the trees at this time with a pyrethroid insecticide kills the egg-laying weevils. On nursery and Christmas trees, phosmet (Imidan), chlorpyrifos (Lorsban, Dursban), and dimethoate (Cygon) can be used, as well as pyrethroids. Pruning off and destroying infested shoots during the summer is also effective in eliminating the larvae inside. This can be particularly effective in Illinois, where populations of weevils tend to be small, and there are few nearby pines to produce additional weevils. Sprays of the above-mentioned insecticides can also be used in mid-August and September to kill emerging adults. *(Phil Nixon)*

## European Pine Shoot Moth

European pine shoot moth larvae tunnel through the shoots of pines, killing the terminals and commonly causing the candles in the spring to bend over, forming shepherd's crooks. The loss of the terminal causes lateral buds to break and form a new leader. A crooked trunk or multi-trunked tree results, making the tree less valuable for sale as a nursery plant or Christmas tree, as well as changing the tree's appearance in the landscape. Red, mugo, Scots, Austrian, and other two- and three-needle pines are attacked.

At this time, partially grown larvae that have overwintered on the trunk and branches move to terminal buds and tunnel into them. By late spring, the larvae pupate and ¼-inch, orangish moths emerge to mate and lay more eggs. Shoots that were attacked will be hollow inside. The moths do not fly very high, so the terminals of younger trees less than 12 feet tall are primarily attacked, as well as the lower side branch terminals of taller trees. Eggs are laid on terminals, and the resulting larvae tunnel into them. Summer attack is identifiable by several brown needles at the tip, with their bases surrounded by masses of milky-clear pitch.

Scout in the spring for this insect by looking for these brown terminal needles and basal clear pitch. The caterpillars search for new terminals to attack in April when the buds of *Magnolia x soulangiana* (saucer magnolia) are showing pink. The magnolia is in this phenological stage at this time in northern Illinois, where European pine shoot moth is most prevalent. Treatment now with phosmet (Imidan) or pyrethroids should be effective. There is another opportunity in early summer to control this insect when the newly hatched larvae enter shoots. *(Phil Nixon)*

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