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Forest & Shade Tree Insect & Disease Conditions for Maine
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It All Takes Energy

While the subject of energy is a leading concern for most of us now, it is also an issue that trees must cope with on a continual basis. Trees, of course, gather all their energy from the sun through the process of photosynthesis. Trees then allocate that energy to several processes, including growth (new wood formation and shoot extension), reproduction (pollen and seeds), and defense. Survival is a programmed priority for all life forms, so it makes sense that allocation of energy resources to defense and protection is a top priority for trees. Insects and diseases compete directly for the energy that trees have acquired. By feeding on or infecting tree tissues, energy that the tree has stored is compromised by pests in two ways. Direct loss of energy may occur by the consumption of sugars (carbohydrates) and other nutrients by the insects and microorganisms. In addition, is energy is used by the tree to defend against infection, or to produce secondary chemicals to protect against further insect damage.

By keeping trees healthy by reducing or eliminating wounding, and by protecting trees from excessive damage from insects and diseases, more of the energy trees need to continue their other life processes will be available. Think of the application of recommended pest management strategies as an important step towards responsible energy conservation!

**Maine Forest Service Publishes 100th Anniversary Edition of
“Forest Trees of Maine”**

The Department of Conservation’s Maine Forest Service announced the release of the centennial edition of its most popular publication, “Forest Trees of Maine.” The Maine Forest Service published the first edition of “Forest Trees of Maine” in 1908 as a small black and white booklet that detailed how to identify about 50 of Maine’s important trees. It was immediately popular with the public.

In celebration of the book’s centennial, the Maine Forest Service has completely revised the book, incorporating many changes asked for by the public over the years. The new book has over 250 color photographs of Maine’s trees in all four seasons as well as the traditional pen and ink line drawings from previous editions. The book also includes historic photographs from Maine Forest Service archives, illustrating Maine’s rich logging and forest products history.

Single copies of the book can be obtained by contacting the Maine Forest Service at (207) 287-2791.

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INSECTS

Arborvitae leafminer (4 species) – Leafminers are still around this year so check your cedar for their presence. Foliage with recent mines will range from tan to light yellow, or even green. This damage is easily confused with winter injury or damage from fungal pathogens. Mined tips will be hollow and will appear translucent if held up to a strong light. In the Augusta area, most leafminers are in the pupal stage this time of the year. Adults should peak around the last week of June or the first week in July. To check for the presence of adults, gently shake the foliage to force flight.

On lightly infested trees, this pest can be controlled by clipping and burning mine- containing leaves in fall or very early spring. In heavier infestations, treatment to control the moth stage is fairly effective and will prevent egg-laying. Repeated treatments may be necessary to control the adults as their flights may extend over several weeks. Another option is to wait until new mines appear in early August and treat at that time. Chlorpyrifos (Chlorpyrifos), Bifenthrin (Talstar) and Permethrin (Permethrin) are some of the contact insecticides registered for control of leafminers. These contact insecticides can be used on both adults and larvae. Control of larvae in mines using a contact insecticide is best achieved with an emulsifiable concentrate, however wettable powder sprays will provide adequate control and are less toxic for applications around home grounds. Acephate (Orthene) and Imidacloprid (Merit 75 WP) systemic insecticides are also registered for larval control within the mines.

Aspen Problems – The leafroller complex was back again on the quaking aspen in central Maine. Defoliation was particularly noticeable along the interstate from Clinton to Bangor.

***Balsam Gall Midge** (*Paradiplosis tumifex*) - Check Christmas tree plantings now for signs of galls. The population is low to moderate but does not seem to be a problem in forested stands. Treat with Diazinon or chlorpyrifos (Lorsban) after the new growth flares.

***Balsam Twig Aphid** (*Mindarus abietinus*) – Twig aphid populations in forested stands are higher this year than they have been in recent years. The aphids feed on the newly emerging foliage causing it to twist and distort. The tips of the branches then look unsightly – not good for Christmas trees or wreaths but the aphids do not damage the trees. It is too late to control the damage. Wreath makers may need to work harder gathering suitable foliage this fall.

***Birch Leafminers** (*Messa nana* and *Fenusa pusilla*) - Trees in central Maine have relatively few leafminers on them but some locations in the northern part of the state have heavier populations. The larvae are now actively mining the leaves. Soil systemics for these miners should already have been applied. Foliar treatments to preserve aesthetic quality of birch should be made as soon as the tiny mines appear although it is getting late to protect trees in the southern half of the state. Acephate (Orthene) and carbaryl (Sevin) are registered for this purpose. Don't confuse developing blotch mines of the leafminers with translucent spot mines of the casebearer. Control for casebearer should have been applied in May.

***Browntail Moth** (*Euproctis chrysorrhoea*) - The browntail moth population is centered around the lower portion of Merrymeeting Bay in Bath, Brunswick, Topsham, West Bath and Bowdoinham. The population is doing very well and may be on the increase again. Caterpillars are now entering the fifth instar and are at the stage where the danger to people of developing dermatitis and respiratory problems from contact with toxic hairs has increased significantly in infested areas. Spraying at this time will not prevent allergic reactions, as dead caterpillars have hairs too and those hairs will still be around.

***Fall Cankerworm** (*Alsophila pometaria*) – The fall cankerworm infestation in southern Maine has crashed. Although some larvae were found earlier in the season, no defoliation resulted.

***Gypsy Moth** (*Lymantria dispar*) – Winter egg mass surveys indicated continued low populations of gypsy moth this year. But every time I look at hardwood trees I find a gypsy moth caterpillar munching away. There are not very many caterpillars in any one location but they are widely present on the trees. I would expect to see the population increase significantly and next year they may be a problem.

***Hemlock Woolly Adelgid** (*Adelges tsugae*) – The mobile stage of hemlock woolly adelgid, the crawler, is active this time of year and is easily transported. Take precautions, such as washing equipment and clothing, when moving from working around infested hemlocks to working around uninfested hemlocks. Crawlers will settle by early August. *Please report any suspected findings of hemlock woolly adelgid to the Insect and Disease Lab.*

***Spruce Galls** (*Adelges abietis* and others) - Galls are starting to form on the new foliage of spruce trees. Now is the time to prune and destroy the galls to reduce the population and preserve the aesthetic appearance of the trees. It may be better to replace trees that are heavily infested by galls year after year.

***White Pine Weevil** (*Pissodes strobi*) - Infested terminal shoots on pine and spruce will begin wilting by the end of the month. Early detection and corrective pruning can minimize the long term impact of this pest. Wilting terminals should be cut off and destroyed - do not just leave them on the ground; the larvae will survive perfectly well lying on the ground.

DISEASES AND INJURIES

Hail Damage -During last August, an intense hailstorm occurred in central Maine that was centered in the town of Rome (Kennebec County). Hail as large as two inches in diameter was reported. Foliage was stripped from trees, and significant branch and stem wounding occurred on all species. The affected area included 7,817 acres of mixed hardwood stands. Observations in October of 2007 indicated that many trees, in particular the aspens, had re-foliated. This response so late in the growing season significantly depleted the starch (food) reserves of the trees. This spring, most of the damaged trees are struggling to re-grow new foliage and crowns. The aspens are under severe stress, and most will not likely recover, because of the energy lost from re-foliating last fall. The intensity of the damage is obvious to anyone travelling along Route 27 through Rome. Many trees have very thin crowns, and both small and mature pine have been killed outright from the mechanical damage and loss of foliage that the hail caused.

Maple Anthracnose (*Kabatiella apocrypta*) - Last week, for the first time this season, we have obtained samples of maple anthracnose. The disease was found in Whitefield and Rome. It has also been reported from Readfield, Freeport and the greater Portland area. Red, sugar, and Norway maples can be affected; the samples we observed were from red and sugar maples. Symptoms include blackened, irregular areas of leaf tissue along the leaf veins, and irregular black spots on the leaf blade itself. Some infected leaves may also be dropping prematurely. It is too late in the season to control with fungicides, but we expect most occurrences of this will cause minimal damage. Weather conditions this season have not been especially conducive to disease development. However, maples in localized areas or even some individual trees may experience some notable leaf damage.

Ash Leaf Rust (*Puccinia sparganioides*) – The first ash leaf rust infections of this year were found late last week on white ash trees in Bucksport and Castine. It is likely to be found elsewhere along the mid-and south-coastal regions, and may become much more noticeable over the next several weeks. The alternate hosts of this rust are species of the salt marsh grasses in the genus *Spartina*. This is the reason that the disease is largely limited to and most severe in coastal areas. Infection levels appear to be low to moderate so far.

The rust develops as bright yellow spots on the leaves and petioles, and can infect all ash species in Maine (white, green, and brown (black) ash). Eventually, the infected leaves curl, turn brown, and fall. Extensive defoliation from this disease has not occurred since the mid- to late 1990's

Cytospora Canker of Maple (*Cytospora chrysosperma*) - An unusual occurrence of *Cytospora* canker was observed from an ornamental Norway maple in Yarmouth. *Cytospora* canker is more commonly found on aspen, poplars, and willows, but can occur on a variety of maples, birches, ashes and elms, as well. The fungus can infect trees or parts of trees that are injured or in a weak or stressed condition. Trees affected by drought, insects, sunscald, herbicides, or mechanical injury are susceptible to *Cytospora* infection. The disease especially affects trees with mechanical root or stem damage.

The symptoms of this disease are yellow to orange-brown discolored areas on the bark of the trunk and branches. Liquid oozing from bark wounds is common. Cankers, sunken dead areas of bark, with black fruiting structures of the fungus (pycnidia) may be evident. Under moist conditions, masses of spores ooze from the pycnidia in long, orange, coiled, thread-like spore tendrils. Reddish brown discoloration of the wood and inner bark also may be evident.

Because this canker usually occurs on a weakened host, the most effective method of control is to prevent stress on the tree. Drought and soil compaction are common causes of stress to trees in landscapes. Wounds caused by lawnmowers and weed trimmers are also prime targets for infection. Insect borers and insects causing defoliation will also reduce tree vigor.

Once infection occurs, the best treatment is to increase plant vigor and follow disease sanitation procedures. Remove all infected limbs. Remove branches by making a smooth cut at the base of the limb, without damaging the branch collar (the swollen area at base of branch). Jagged and rough cut surfaces facilitate infection. Clean wounds to avoid further spread of infection. Allow the wounds to dry naturally. Wound dressings are not recommended, as they often promote moisture retention which favors disease development.

Balsam Fir Needle Casts (*Lirula nervata* and others) - Several needle cast diseases of balsam fir have now become evident in forest areas, in landscape plantings, and in Christmas tree plantations. Three common needle diseases are caused by the fungi *Lirula nervata*, *Lirula mirabilis*, and *Isthmiella faullii*. Symptoms of all three are similar, and include needle browning or reddening of last year's needles, and tanning, bleaching, and early shedding of needles from two years ago. Current season foliage will appear green, even though infection may have already taken place. If infected, these needles will not turn a visible red or brown until next year. Samples of *Lirula nervata* observed on two and three year-old needles have been received most recently from Lincoln and Kennebec counties, but this and the other needle cast fungi are known to occur throughout the state.

These diseases are usually not seriously damaging to the long-term health of the trees in forest or landscape settings, but can be an especially significant problem for Christmas tree growers. There are no effective chemical controls available or recommended, but several cultural techniques may be helpful. Most importantly, shearing Christmas trees in wet weather during late spring and summer should be avoided, since spores can be spread from tree to tree on shearing tools. Shearing disease-free trees first and affected trees last can also help reduce the spread of these pathogens.

Weir's Rust on Spruce (*Chrysomyxa weirii*) - We have received reports from the University of Maine, Cooperative Extension, of the occurrence of Weir's rust affecting blue spruce in the towns of Skowhegan, Oxford, and Cumberland Foreside. This pathogen causes a needle disease on several spruce species, including white, blue, Englemann, and black spruce. Current season foliage becomes infected in early spring. By June, the infected needles will appear with banded yellow spots. These infected needles remain on the tree until the following spring, when the spores that are produced on thick cushion-like structures within the yellow bands are released. Weir's rust is a microcyclic rust, which means that only two spore stages are present (unlike macrocyclic rusts, such as white pine blister rust, with five different spore types). There is no alternate host. This disease is not considered to be a serious threat to tree health, but occasionally may be severe enough to cause a loss in aesthetic value to ornamentals. No chemical controls are available or required.

Root Rot of Red Pine (*Heterobasidion annosum* [= *Fomes annosus*]) - Root rot caused by the decay fungus *Heterobasidion annosum* has occasionally resulted in high mortality and substantial losses in many red pine (and white spruce) plantation stands throughout Maine for many decades. The disease continues to be a problem for plantation management. Most recently, two stands in Winthrop have been found to be damaged by *H. annosum*.

Once the pathogen becomes established in recently-cut stumps and roots, the site remains at high risk for disease development for at least a rotation. This often necessitates conversion of infected stands to other, non-susceptible species (usually hardwoods).

Bleeding Canker of Maples (*Phytophthora* spp.) – Another unusual canker disease, commonly called bleeding canker, was found in Randolph, Maine this spring. The infected sugar maple tree exhibited a distinctive coffee-brown or dark rusty reddish-brown to black discoloration of the bark. Infection had apparently occurred around stem basal wounds resulting from equipment damage. Affected bark tissues were oozing a dark reddish-brown exudate, especially at the

advancing margins of the infection. Lesions are known to advance rapidly upward from the groundline (several feet in a matter of weeks or months) and may progress well into the scaffold branches. Infected trees can be killed quickly or may remain green for months before eventually wilting and dying. Norway and red maples are generally considered more susceptible than sugar maples, but most maple species are susceptible. However, in Maine this disease is only rarely encountered. No specific recommendations for control are available for trees that have already become infected. Prevention of stem and basal wounding, and keeping trees in good vigor free from agents of stress (including excessive moisture and flooding, drought, insect defoliation, etc.) are considered the best management options.

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