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Forest & Shade Tree - Insect & Disease Conditions for Maine June 15, 2012

Invasive Insect Arrives in Maine -Winter Moth Found in the Mid Coast

The invasive geometrid winter moth (*Operophtera brumata*) was found in Harpswell and Vinalhaven in the past month. This green inchworm defoliates a wide range of host trees, shrubs and understory plants. Favored hosts are oak, maple, birch, apple, cherry and blueberry.

Winter moth is native to Europe and was first found in North America in Nova Scotia back in the 1930's where it devastated the apple crop and killed large numbers of trees. Biocontrol in the form of two imported parasites have since brought it under control in the province. Winter moth was subsequently discovered in British Columbia, Oregon and Washington where the parasitic fly (*Cyzenis albicans*) has been released as a control mechanism. Most recently winter moth has defoliated tens of thousands of acres in eastern Massachusetts and is killing trees there. It is moving into surrounding states and western MA. Now it has been found in Maine.



At least several hundred acres in Harpswell and a small area in Vinalhaven have light to moderate defoliation on oak, maple, birch, cherry, apple, blueberry and other trees, shrubs and understory plants. There are other locations along the coast that still need to be checked for the presence of the moth. The larvae have completed their feeding now so confirmation of additional sites will need to wait until winter when the adults emerge, or next spring. Sites with defoliation from this spring should be noted so they can be part of future surveys for winter moth.

Winter moth larvae are small green inchworms that hatch in early spring and initially put out silk to 'balloon' on the wind dispersing to more hosts. They then feed first on the buds, webbing the new leaves together. As the leaves expand the feeding takes on the appearance of Swiss cheese and then the larvae consume all the foliage as the infestation progresses. Feeding is completed in early June when the larvae 'silk down' to the ground where they form cocoons and stay all summer and fall. The adults emerge from the ground in late November and December. The



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males fly and come to light. The females have no wings and so are flightless; they crawl up host trees to lay their eggs. Images of the larvae and feeding damage can be found at: www.maineforestservice.gov/InvasiveThreats.htm#wm.

Confounding the problem is that there is a closely related native insect, Bruce spanworm (*Operophtera bruceata*), that occasionally becomes a pest in Maine. Its population is on the rise right now and we are seeing light to moderate defoliation from this insect in north-central Maine. Bruce spanworm populations increase to damaging levels for three or four years and then subside, often for many years, before showing up again. Winter moth larvae just keep on eating as native parasites, predators and diseases apparently do not keep them under control.

We are delineating the extent of the current winter moth population and considering control strategies. Massachusetts is currently working to bring its winter moth population down using the fly *C. albicans* and we will be working with the researchers to possibly use the same strategy in Maine. This is something that takes years to establish but is potentially a long term solution to controlling this pest. There may be other solutions as well.

A concern is spreading the winter moth further. Larvae disperse to some extent by ballooning to nearby locations. But humans are probably a far greater factor in moving this insect than natural spread. Winter moth cocoons are in the soil from late May until November. Any landscape plants moved from infested areas can have winter moth in the soil. So don't move plants from areas infested with winter moth.

Three Ways of Monitoring for Emerald Ash Borer in 2012

Emerald ash borer (EAB) has not yet been found in Maine, but the Maine Forest Service is using three methods of looking for it.

Nine hundred and fifty-five **purple sticky traps** have been hung in ash trees throughout the state at sites pre-selected by a scientific model. The traps were placed in May and will be monitored throughout the summer, then removed in the fall. Several agencies at the federal, state and tribal level are assisting with this project. For more information, go to www.maineforestservice.gov/purpletraps.htm

In cooperation with the University of Maine, we are coordinating a volunteer-based **trap-tree network** throughout the state. In this program, landowners who are willing to sacrifice an ash tree on their property will girdle a tree in June. This will stress the tree, making it more attractive to any EAB in the area. In the winter, they will cut down the tree and bring it to one of our workshops where we will work with them to peel the bark off the trunk and look for signs of EAB. If you are interested in participating in this program, please contact Colleen Teerling (colleen.teerling@maine.gov) or Molly Lizotte (molly.lizotte@maine.edu) for more information.

And again, this year, we will be using **biosurveillance** to look for EAB. *Cerceris fumipennis* is a native non-stinging wasp that we are using to help us monitor for emerald ash borer (see www.maine.gov/cerceris). Usually we don't see *Cerceris* in Maine until July, but it may emerge earlier this year, due to the warm spring. This ground-nesting wasp prefers hard-packed sandy soil in sunny locations. It may also be a baseball fan, since we commonly find it in baseball diamonds. If you are concerned about EAB, a useful thing to do is check your local baseball diamonds near ash for *Cerceris*. If you find any possible colonies, please let Colleen know at colleen.teerling@maine.gov.

Summer Help

As in previous years we have help in this busy season from interns in the Maine State Government Summer Internship Program. Nathan Durant is a 2012 graduate of the University of Maine in Farmington with a major in biology. Benjamin Timm is a junior at Colby College majoring in biology with a

concentration in environmental sciences. Allison Tsomides is a junior at Bates College majoring in biology. They arrived late last month and immediately set to work sorting trap samples and surveying for hemlock woolly adelgid. In July they will have a major role in servicing the purple traps.

Insects

Arborvitae Leafminer Complex – Cedar in the northern part of the state is showing browning from the feeding of arborvitae leafminers as well as other problems as we have been saying for a number of years now. There are four species of leafminers that feed on cedar in Maine. The larvae feed inside the needles causing them to turn brown. There will be a small hole in each mine that can be seen with a hand lens. 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. The larvae overwinter in the needles then resume feeding in the spring. The moths will be flying soon to mate and lay eggs.

High value trees can be monitored for the presence of leafminer adults. From the end of June into early July periodically shake the branches of the trees and if clouds of tiny moths fly out, it is time to treat. Use a contact insecticide to kill the moths – they do not feed.

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.

***Balsam Gall Midge** (*Paradiplosis tumifex*) - Adults of this species have now laid their eggs and the developing galls containing larvae are evident as swellings on the needles. Control at this time will still help even if not as effective as earlier treatment.

***Balsam Shootborer Sawfly** (*Pleroneura brunneicornis*) - This sawfly causes the buds of balsam and Fraser fir to turn brown and have a 'button' appearance. If you break off the tiny shoot the stem will be hollow. It looks similar to frost damage but has the hollow stem where the sawfly larvae fed. The buds often fall off or can be pruned off but the reduced growth can cause Christmas trees to be misshapen. It is a difficult pest to control in Christmas tree plantations; it is never a problem in the forest. Larvae have now dropped to the soil and it is too late to control the problem this season.

Blackheaded Ash Sawfly (*Tethida cordigera*) – This is an occasional defoliator of white ash – the most common species of ash in Maine. The larvae are cream-colored with, of course, a black head. As with many Maine insects there is just one generation a year with the larvae feeding in May and June. The larvae drop to the ground when finished feeding and pupate in the soil. Adult sawflies, they look like fat-waisted wasps, emerge in the spring and lay their eggs on host trees. Not having seen this sawfly before I do not know what the prognosis for damage is or how widespread it might be. It was identified from ash in Farmingdale but there is currently no defoliation.



***Browntail Moth** (*Euproctis chrysorrhoea*) – The browntail issue has both good and bad news. The wet weather in May created the right conditions for an epizootic (disease outbreak) in the browntail moth population killing at least some of the caterpillars in Freeport. During cold wet weather the browntail moth caterpillars huddle together on their webs and, just like people in the winter time: if one of them gets sick, then they all catch it. The causal agent, a naturally occurring fungus (*Entomophoga aulicae*) that infects only browntail moths, requires moisture to spread throughout the caterpillar population. People

that have had browntail last year (or this) still need to be cautious mowing and raking as the hairs stay active for a year or more.

Unfortunately, the unusual spring weather meant that the caterpillar development was as much as three weeks ahead of normal and some of them may have avoided the fungus because they were already beginning to pupate by the time the cool, wet weather hit in earnest. We will have to wait until this winter to see what the population has done. Browntail continues to be an issue in Falmouth and Yarmouth. Another outlier population has developed in Vassalboro in white oaks to add to the inland locations of Turner and Augusta.

We do not know what drives the browntail moth populations and are concerned about continuing to find populations thriving away from the coast. This may be weather related or there could be some other factor that is not keeping the caterpillars under control inland at this time.

The biocontrol work using the virus EcNPV was overrun again by the fungus epizootic in Freeport. This is good and bad. It makes evaluating the product impossible but also means relief for the area residents.

***Bruce Spanworm** (*Operophtera bruceata*) – Light to moderate damage from this early season defoliator was again found in T2 R8 NWP west of Lincoln with another report from Alder Brook Twp near Jackman. Feeding was on sugar and red maples, birch, beech and aspen. Damage may be more widespread and as yet undetected.

The small green ‘inchworms’ start feeding on the buds even before the leaves open. Often by the time damage is noticed, the larvae are almost done feeding. This pest prefers maples and poplar but will also feed on willow, beech, white birch, red oak, pine and choke cherries. The larvae have now finished feeding and have dropped to the ground to pupate. They will spend all summer and fall in the soil.

Outbreaks are most often localized and usually last three to four years before natural control factors such as parasites, predators and disease cause the population to collapse. Trees subjected to two or more years of heavy defoliation may exhibit noticeable growth reduction, especially those that are weak or growing on poor sites. Heavy defoliation of sugar maple may result in some reduction of sap flow or sugar content.

The male moths fly in November (one of the ‘hunter’s moths) and readily come to lights. The females have no wings and so are flightless. This species is very closely related to the invasive winter moths that have recently been found on the coast. If you see clouds of moths in November or December it could be one of these two pests or the fall cankerworm (see next entry). Reports of this activity would be greatly appreciated.

Fall Cankerworm (*Alsophila pometaria*) – This hardwood defoliator has periodically appeared in Maine in damaging numbers. Tens of acres at least (aerial survey is scheduled for later this week to see how extensive the area is) of red oak and other hardwoods have been defoliated in Clinton and Burnham. In the past outbreaks have been localized lasting three or four years. Trees that are heavily defoliated for two or more years can have reduced growth, branch dieback or tree mortality. The last outbreak was in 2006-08 in southern Maine covering over 13,000 acres.



This insect is similar to the winter moth and Bruce spanworm. The males fly in October and November - the females are flightless and climb up host trees to lay their eggs. The eggs overwinter and hatch in early spring as the buds begin to swell on the trees. The larvae are pale green to dark brownish-green inchworms that first feed on buds then skeletonize the leaves and finally eat all but the midribs. By mid-June the feeding is done and the larvae drop to the ground to pupate in the soil until late fall.

***Gypsy Moth** (*Lymantria dispar*) – Gypsy moth egg mass counts were up slightly last fall, however sightings of the larvae are way up this spring. As the hairy larvae develop, they can be recognized by the characteristic paired blue and red spots along their backs (photo, right). Please report any significant defoliation by this pest to our office.



***Hemlock Woolly Adelgid** (*Adelges tsugae*) – Due to a cooperative agreement between our division and the USDA Animal and Plant Health Inspection Service two releases of 5000 hemlock woolly adelgid predator beetles were conducted this spring. The lab-reared *Sasajiscymnus tsugae* lady beetles were used to augment populations released last year at Vaughan Woods Memorial State Park in South Berwick and Wolfe’s Neck Woods State Park in Freeport. Augmentative releases were chosen in part because of a recent USFS shift towards releasing more beetles at fewer release sites.

The US Forest Service has a new publication detailing biological control of hemlock woolly adelgid titled *Implementation and Status of Biological Control of Hemlock Woolly Adelgid*. The electronic version of the book can be found at: <http://www.na.fs.fed.us/pubs/fhp/hwa/bio-control.pdf>. A limited number of hard copies were produced and a copy can be requested from Brad Onken or Richard Reardon at the US Forest Service in Morgantown, WV, bonken@fs.fed.us or rreardon@fs.fed.us, (304) 285-1546.

Oak Olethreutid Leafroller (*Pseudexentera cressoniana*) – This is another native hardwood defoliator!



It is reported to rarely cause major problems and little is known about it. This is true of most insects; they are around in low numbers with only a few species that have explosive populations. This one caused some defoliation on red oak last year in Cherryfield. This year a landowner called in April asking what the clouds of moths were. He sent in a sample and they proved to be the oak olethreutid leafroller adults. The larvae have since hatched and caused moderate defoliation on hundreds of acres (this will be flown, too) These leafrollers were also found in Augusta causing light defoliation on a just a few acres.

The larvae first roll the tips of the oak leaves, feed within the roll and then go on to consume all but the ribs of the leaves. The larvae are tan with a black head and are finishing feeding now. They will drop to the ground where they will stay in cocoons until next spring.

Satin Moth (*Leucoma salicis*) – Just a few reports of satin moth on poplar have come in so far this year. The satin moth caterpillars are quite striking – brown with large white dots running down their backs and hairy red bumps sticking out from their sides. The caterpillars overwinter so they are ready to feed as soon as the leaves come out and will completely consume the leaves except the larger veins. They make their cocoons on the trees and the moths emerge in July. The eggs hatch, the tiny caterpillars skeletonize leaves in late summer and then hibernate on the trees.



Spiny Oak Sawfly (*Periclista* sp. probably *albicollis*) – This occasional defoliator of red oak was found in Cornville on a yard tree. As with many other early season defoliators it spends July through April in cocoons in the soil. The adult sawfly emerge in early spring, lay eggs on host trees where the larvae emerge and feed on the new foliage.

Spruce Budworm (*Choristoneura fumiferana*) – Not here in noticeable numbers YET. Quebec’s infestation continues to expand southward toward Maine. New Brunswick has found some budworm larvae east of Maine and seen a rise in the catches of spruce budworm moths in their pheromone traps. Our budworm trap catches are on the rise as well. Budworm is not a problem this year in Maine but it is on the horizon in the not too distant future.

Please send in reports (as well as photos and/or samples if possible) of any fir or spruce in northern Maine that have foliage webbed together and chewed as the larvae should be finished feeding now. The moths will be flying in June so report any unusual amounts of small brown moths. Catch and send some in if possible. We do have traps out but they are not everywhere and any additional eyes in the woods are appreciated.

***Yellowheaded Spruce Sawfly** (*Pikonema alaskensis*) – This insect has not been seen much in the past few years but if it is going to show up, now is when it would begin feeding. As the month progresses look for the tiny striped larvae feeding on new foliage on ornamental spruce and in black spruce plantations. The larvae are hard to see and bare shoots or frass on the ground may be the first indicator of a problem. These insects generally return to trees that have been fed on by yellowheaded spruce sawfly in the past.

Diseases and Injuries

Anthracnose Diseases of Hardwoods – As this spring season developed into yet another one with higher than normal precipitation, an increase in the incidence and severity of many foliage diseases has occurred. Specific locations of occurrence are listed here, but the diseases are widespread, and may be found anywhere in the State where the susceptible tree species grow. Maple anthracnose, most commonly caused by *Kabatella apocrypta*, has been observed on red maples from Linneus and Naples, and on sugar maples in Portland and Alfred. Oak anthracnose, commonly caused by the pathogen *Apiognomonina quercina*, has been reported from Newfield and Poland. The most damaging anthracnose disease occurs on sycamore, and is caused by the pathogen *Apiognomonina veneta*. Sycamore anthracnose can result in substantial branch and twig cankering and dieback, along with the usual leaf symptoms associated with all anthracnose diseases. Sycamore anthracnose was reported from Hallowell.

Protectant fungicides need to be applied before leaf infection occurs, so in most cases it is now too late in the season for chemical control to be effective. The one exception may be sycamore anthracnose, as severely defoliated trees can often re-foliate by late spring or early summer. Protection of these newly developing leaves may be worthwhile, and would help to reduce the level of twig and branch dieback which often follows.

Armillaria Root Rot (*Armillaria* spp.) – Increased attention to the ash resource due to the threat of emerald ash borer being spread to Maine has resulted in several requests for inspection of ash trees and stands. Declining white ash was most recently observed in Owls Head and in Warren. The decline in both cases resulted from older mechanical injuries to the root crown, and subsequent infection by *Armillaria* root rot. In both instances individual tree decline was apparent, but not a general stand decline.

Balsam Fir Mortality – Some Christmas tree plantations continue to be plagued with occasional mortality of trees from causes difficult to explain. Apparently healthy individuals will undergo a rapid decline, with needles often turning first a pale yellow then an orange-red. Trees of all ages, including those within a year or two of market size, can be affected. Attempts to find *Armillaria* root rot is sometimes, but not always successful. *Phytophthora* root rot, also suspected in some cases, has not yet been confirmed from any plantation location. The most consistent explanation has been that most mortality has occurred on poorly drained, heavier soils, or in “wet runs,” where soil has remained saturated. The syndrome was most recently observed in Presque Isle and Standish, but is known also to affect many balsam fir plantations in the mid- and south-coastal region.

Balsam Fir Needlecast (*Lirula* spp., *Rhizosphaera pini*) – Needlecast diseases of balsam fir are expected to be prevalent again this year and next year, as well. The most recent observation of the disease was reported from Canton. Conditions of high moisture, conducive to needle infections, have been the rule this spring. Current-season needles infected this year will discolor and fall in 2013 or 2014. Growers should monitor for “pockets” of needlecast in their plantations, and plan a treatment strategy for next spring where warranted.

Blossom Blight on Ornamental Cherries (*Monilinia* spp.) - Blossom blight, sometimes also referred to as brown rot, was observed on ornamental cherries in Brunswick and Camden. Normally, this disease is most damaging to the fruits of cherries, peaches, and other stone fruit varieties. Infection of flower buds and flowers can also result in branch dieback and stem cankering. Infection of spur shoots results in blackening and death of flowers and leaves.

Crown Rust (*Puccinia coronata*) – An unusual disease of buckthorn (*Frangula alnus*) was noted by entomologist Allison Kanoti this past week. She observed buckthorn infected with crown rust in Freeport, at Wolfe’s Neck Woods State Park. The primary hosts for this disease are oats and barley grasses. Several species of buckthorn can serve as the alternate host for this rust (see photo). Note that both leaves and flower buds can be infected. The disease is of most concern to those growing either oats or barley as crops. Unfortunately, it is unlikely to be damaging enough to exert any significant level of biological control on buckthorn.



Dothistroma Needle Blight (*Dothistroma pini*) – Red-band needle blight was reported on Austrian pine from Prouts Neck in Scarborough. Common to many hard (two- and three-needle) pines the disease is most severe on non-native species such as Ponderosa, Austrian, and Mugho pines in Maine.



Fir Tip Blight (*Delphinella balsameae*) – Fir tip blight, which was prevalent in northern Maine in 2010, was observed in natural stands of balsam fir in Township 19 ED BPP, and on Concolor fir from Gorham (see photo). Concolor fir is apparently more susceptible to damage, but the disease can also cause concern in balsam fir Christmas tree plantations. Stand characteristics which may be conducive to fir tip blight have not been documented. It is of interest to note that the affected natural stand in T-19 MD BPP was pre-commercially thinned many years earlier, and developed similarly (perhaps) to that of a

plantation, with well-developed crowns and high crown ratios.

Phomopsis Branch and Stem Galls (*Phomopsis* spp.) - Oaks infected with *Phomopsis* galls tend to be spatially clustered, or defined by stand or location infection centers. Galls develop over a long period of time, and may be of almost any size, from smaller than a marble, to golf ball or basketball sized (see photo). Multiple galls on individual trees can result in branch dieback and even in tree mortality. The disease is poorly understood, and the only practical management option is to remove the galls through pruning, or harvesting of severely affected trees. The disease has been reported in a stand of red oaks in Whitefield.



Powdery Mildew (*Sphaerotheca macularis*) – A sample of ninebark (*Physocarpus opulifolius*) infected with powdery mildew was submitted from Biddeford. This is another example of a foliage disease that has benefitted from the wet spring weather. As with most leaf disease, fungicide controls would need to be applied early in the spring, at the time of budbreak and leaf expansion.

Rhododendron Leaf Spot (*Colletotrichum gloeosporioides*) – *Rhododendrons* appeared to have come through the winter in better condition than usual, probably as a result of the lack of extreme cold weather. While there have been no reports of leaf burn from winter desiccation, several reports of leaf spots have been submitted this spring. The common leaf spot caused by *Colletotrichum gloeosporioides* appears to be the most frequently occurring problem. A sample of this was most recently submitted from Saco.

Sapsucker Damage (*Sphyrapicus varius*) - Sapsuckers are a subclass of woodpeckers that can damage trees by their feeding activity. Most new damage occurs in early spring, when the birds create regular rows of holes through the bark. Favored trees include hemlocks, aspens, and especially fruit trees of almost any kind. Heavy damage was observed on flowering crabapples in Auburn a few weeks ago. For more information on sapsucker injury to trees, consult:

http://www.na.fs.fed.us/spfo/pubs/howtos/ht_sap/sap.htm.

White Pine Needle Cast and Needle Blight (*Canavirgella banfieldii*, *Bifusella linearis*, and *Mycosphaerella dearnessii*) - For the past two weeks, needle browning in the crowns of white pines has become more apparent. White pine needle damage has been of critical concern in Maine and throughout the northeastern states for several years. From observations around the state, and indications from other forest health personnel in other states, this is likely to be another year when heavy defoliation of one-year-old needles will occur. Needles infected the previous year start to yellow and turn brown around mid-to late May. The discolored one-year-old needles are most obvious through the month of June, but are quickly shed. In Maine, usually by the Fourth of July most infected needles have been shed from the trees and the tree crowns will appear extremely “thin.” White pines compromised by other factors such as poor site, soil compaction, mechanical damage, etc. are especially at risk from the needle diseases, and some mortality may occur. A Pest Alert on white pine needle damage is available and can be requested from our office at the following address: **Maine Forest Service 168 State House Station, Augusta, Maine 04333-0168**. It is also available on-line at: <http://nrs.fs.fed.us/pubs/5247>

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Maine Forest Service

Forest Health and Monitoring

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