Northeast Wisconsin Forest Pest Update

April 14, 2011

Topics covered this month:

Insects:
Cynipid wasps in oak branches
Eastern tent caterpillar
Emerald ash borer
Gypsy moth
Mountain pine beetle jumps to jack pine
Ticks

Diseases:
Annosum infection
Beech bark disease resistance
Dutch elm disease tolerant cultivars
Oak wilt online tool updated
Sudden oak death online meeting

Other:
DNR's urban forestry program hiring
Squirrel damage on sugar maple
Spider heart or star shake in oak
Storm damage

Insects

*information and photos in this document from Linda Williams unless otherwise noted.

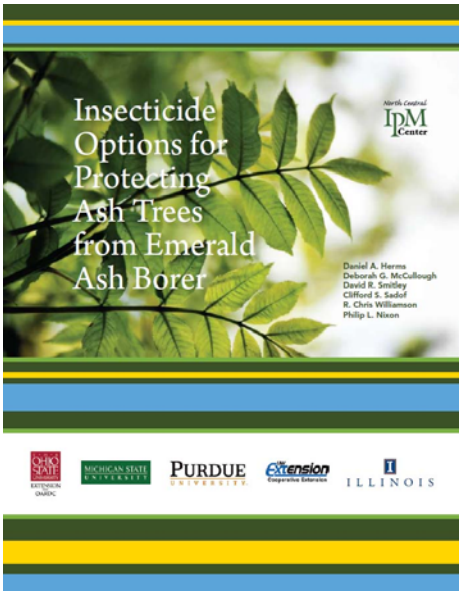
Cynipid wasps in oak branches – these branches, from bur/swamp white oak crosses, where from the Green Bay area and are just riddled with tiny cynipid wasps (about 12-20 per square inch). Many cynipid wasps create galls on trees. These tiny wasps were infesting the branches of mature trees and the woodpeckers had found them and caused significant damage to the branches. I'm unsure if the wasps alone would have created enough damage to the branches to cause any significant dieback but the damage from the woodpeckers, which removed much of the outer bark and damaged much of the inner bark and cambium, will definitely be a problem for the tree. Phil Pellitteri has observed that some of the bur/swamp white oak crosses seem to be highly susceptible to cynipid wasp attack, possibly indicating genetic predisposition.


Cynipid wasps infesting branches, scale markers are in millimeters.

Branches heavily infested with cynipid wasps and damaged by woodpeckers.

Eastern Tent Caterpillar - small webs created by Eastern Tent Caterpillar will be appearing soon on wild cherry trees (right). I noticed the first webs in Oconto County on a crabapple tree on April 11 last year, but that early emergence was due to the warm spring that we had last year. Typically hatch will occur near the end of April. The caterpillars are capable of completely defoliating the tree that their web nest is located in. They will feed outside the web nest and return to the nest to rest. Cherry is a favored species and you'll often see Eastern Tent Caterpillar webs in small cherries along roadsides during the spring. Cherry generally handles this defoliation well, sending out a second set of leaves later in the season. Homeowners should avoid using fire to remove nests from trees, as this is a good way to start a wildfire. Instead, homeowners can use a rake to pull the web out of the tree and dump it into a bucket of soapy water to kill any caterpillars inside. People may mistake eastern tent caterpillar for gypsy moth but gypsy moths do not create webs like Eastern Tent Caterpillar does.

Emerald Ash Borer – from Bill McNee. Property owners who are considering treating their ash trees with insecticide should apply them during the spring. A detailed brochure is available online at: https://onlineservices.datcp.wi.gov/eab/articleassets/InsecticideOptionsForProtectingTreesFromEAB.pdf. The current recommendation is to consider treating high-value trees with insecticide if within 15 miles of a known EAB infestation. More information on insecticides is found in the gypsy moth section of this pest update.



A pesticide webinar worth watching - Deb McCullough, Professor of Entomology at Michigan State University, recently spoke about current EAB insecticide research on a webinar, available at www.emeraldashborer.info, EAB University. The title to search for is "EAB pesticides for professionals."

The Wisconsin Dept. of Agriculture, Trade and Consumer Protection will begin hanging purple EAB traps in late April. There will be about 6,000 traps hung around the state. In addition, some of the state parks will have a 'double-decker' EAB trap present this summer.

Scientists at the US Dept. of Agriculture recently reported finding a chemical attractant for EAB that may improve the effectiveness of EAB traps. The chemical of interest is released by female EAB adults as they feed on the foliage. For more information, visit: http://www.sciencedaily.com/releases/2011/04/110407121341.htm.

The video at this YouTube link describes the three parasitic wasps being released in the Midwest to fight emerald ash borer. The entire video is good, but if you want to skip to the portion specifically related to wasps, fast forward to 3:52.
http://www.youtube.com/watch?feature=player_embedded&v=Jc668J_TxYs

Gypsy Moth – from Bill McNee. On May 1, Juneau and Price Counties will be added to the gypsy moth quarantine. The map at right shows the new gypsy moth quarantine area.

Gypsy moth quarantine area (red) as of May 1, 2011.

Gypsy moths will be hatching soon. The spring of 2011 has been cooler than last year, so we are going to have a later hatch in 2011. Last year, our first report of hatch was from Beloit on April 9. As of April 14, 2011 no hatch has yet been reported in Wisconsin.

Maps of the proposed DNR suppression program treatment areas are now available online at www.gypsymoth.wi.gov. This year the program plans to spray approximately 3,000 acres in 8 counties, including Brown, Marinette, Menominee and Shawano Counties in NER. For more information, visit www.gypsymoth.wi.gov.

Homeowners who are interested in reducing gypsy moth populations should oil or remove egg masses before they start hatching. Horticultural oils that suffocate the eggs are available at many garden centers and large retailers. In general, these are applied when temperatures are above 40^{o} and freezing is not imminent. If removing egg masses, scrape them into a bucket of soapy water and then let them soak for a few days before discarding in the trash. Additional management options for homeowners and woodlot owners (sticky barriers, burlap bands, etc.) are available at www.gypsymoth.wi.gov.

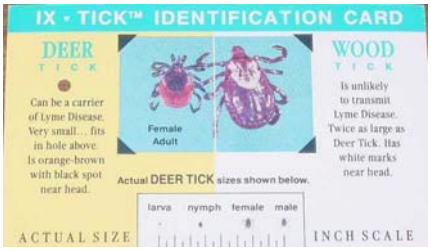
Female gypsy moth laying egg mass.

Homeowners considering insecticide treatments this spring should contact an arborist or tree service soon. The Wisconsin Arborist Association has a list of certified arborists available at www.waa-isa.org. Additional businesses offering insecticide treatments may be found in the phone book under 'Tree Service.' Homeowners can also purchase insecticides at garden centers, hardware stores and large retailers.

If you receive calls from property owners interested aerial spraying this spring, a list of for-hire aerial applicators is available on the state's gypsy moth website, www.gypsymoth.wi.gov. Callers interested in aerial spraying for gypsy moth or other defoliating insects can be referred to this website for the list and a guide to organizing private spraying. There are currently only two applicators licensed for aerial spraying in residential areas (defined as more than one residence per five acres being sprayed). It's too late to add any treatment areas to the DNR Suppression Program for spraying this spring. Applicators should be contacted immediately. Questions about how to organize an aerial spray project should be referred to Bill McNee (bill.mcnee@wisconsin.gov).

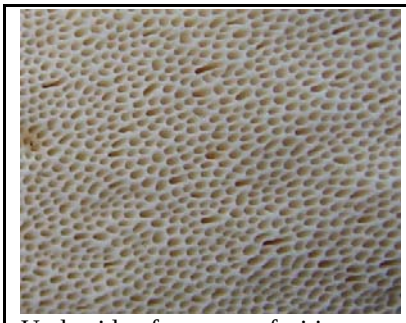
Mountain pine beetle from foresteryimages.org

Mountain pine beetle jumps to jack pine – from Bill McNee. This probably won't affect you but it will likely affect future generations of foresters. Mountain pine beetle, a devastating pine killer in western North America, has spread into central Alberta, where jack pine and lodgepole pine overlap and hybridize. A recent study confirmed that the beetle was breeding in native jack pine stands, and as a result could spread eastward throughout the range of jack pine. Mountain pine beetle has also recently spread into western Nebraska and was first detected there in 2009, and has also been found infesting trees in far western Kansas. For more info read this story: http://www.edmontonjournal.com/technology/Tree+jumping+pine+beetle+spreads+misery/4559673/story.html.



Ticks – ticks are out and looking for you! If anyone needs Tick ID Cards (right) which compare a Deer Tick with a Wood Tick you can order up to 100 for free from Gunderson Lutheran at http://www.gundluth.org/?id=3933&sid=1 Also, I have now collected specimens from all the nymphal stages of the deer tick, including the tiny 6-legged 1st instar nymph (all other immature stages have 8 legs as the adults do). If you would like to see these specimens stop by my office the next time you're at the DNR Headquarters in Green Bay. Sometimes it's hard to picture just how tiny deer ticks are (especially the immature ticks) until you see them in person.

Diseases



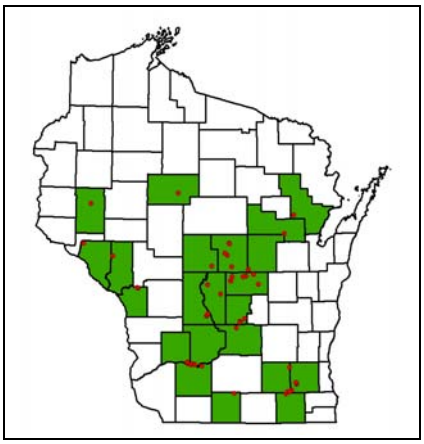
Underside of annosum fruiting body, close-up.

Annosum infection – ever wondered how quickly annosum root disease (*Heterobasidion irregulare*) can really take hold in a stand? Ever wondered if your stand was really at risk and if you should really bother doing the preventative treatments to keep it out of your stand? Some observations were made recently in a stand that was confirmed to have annosum in 2007. A thinning had been done in 2001, which was possibly when annosum entered the stand, or perhaps even before then. Stump treatments to prevent new infections were not applied at the time of the thinning. Currently there are 60 pockets of mortality in the 40 acre plantation. This is just observational, no scientific study was done here, I just wanted to make the point that this disease can be spread easily if stump treatments, using Cellu-Treat or Sporax, are not applied to prevent new infections.

Pockets of mortality in pine plantations should be examined for the presence of annosum. If fruiting bodies are present they will be at the very base of trees and/or old stumps from previous harvests. You may have to pull back the duff layer to see smaller fruiting bodies, which will look somewhat like a shelf fungus and will have a white or cream-colored lower surface

which under magnification is pitted (above). Other symptoms can be quite variable but you may see the following:

- You may or may not see understory species that are being killed by annosum, which can kill all conifers and some hardwoods as well. If understory is being killed you may be able to find fruiting bodies on these young trees.
- The pocket may look like a "typical" pocket with dead trees in the center and fading/dying trees on the edges.
- Or, the pocket may look like a clearly defined area of mortality which you might mistake for a lightning strike or a bark beetle pocket
- You may not see any fruiting bodies, or you might find them only on old stumps, only on dead understory, or only on recently dead trees
- The fruiting bodies may be large shelf-like fungi, small popcorn-like spots, or the flat form which I seem to find more commonly on white pine



If you find annosum, or suspect you have found annosum in the Northeast Region please let me know. There are currently 22 counties where we have confirmed annosum and the forest health program maintains a map of all known locations (above) to help land managers be aware of the risk in their area. For more info on annosum go to http://dnr.wi.gov/forestry/fh/annosum/

Beech Bark Disease resistance – beech bark disease was found in Wisconsin for the first time in 2009. A small percentage (<5%) of American beech are resistant to beech bark disease; another small percentage will be partially resistant while the majority of beech trees are susceptible and will eventually die. The scale and fungus can travel long distances on infested beech logs and firewood. Management options will vary from area to area, depending on the amount of beech present and distance from an infestation. In most cases, it is not desirable to remove all beech from a stand before the disease moves through since this practice would eliminate potentially resistant beech trees. More information about Beech Bark Disease can be found at http://www.dnr.state.wi.us/forestry/fh/exotics/exotic-bb.htm

Collecting samples from a potentially resistant beech tree (branch sample in left hand). Photo by Bill Ruff.

Samples from a beech tree that is potentially resistant to beech bark disease were collected recently from the area east of Sturgeon Bay where beech bark disease is causing decline and mortality. Branch samples are collected from the upper 1/3 of the crown and are acquired using pole pruners or shotgun. The branch samples are taken back to the lab and are grafted onto rootstock where they will grow, later to be cross pollinated with other potentially resistant beech. These seeds could then be out-planted to replenish beech in an area once beech bark disease becomes established in an area.

Dutch Elm Disease tolerant elms – the table below was first published in the May 2007 issue of the Central States Forest Health Watch produced by the US Forest Service. It is a list of the elm

cultivars with comments regarding their tolerance to Dutch Elm Disease. The latest edition of the Central States Forest Health Watch (Feb 2011) has an update on this topic, click on this link and page down to page 5 of the document http://na.fs.fed.us/fhp/fhw/csfhw/feb11/feb11.pdf for the latest updates on progress on these disease tolerant elms

American elm cultivars with DED tolerance

Cultivar	*Origin and notes*	*Commercial availability*	*Comments*
Princeton	Selected in 1922 by Princeton Nurseries in New Jersey for outstanding horticultural characteristics. Fortuitously, it is also DED tolerant.	Moderately abundant	This is the main cultivar being propagated by Riveredge Farms nursery (in Georgia) for distribution by Home Depot.
Valley Forge (Amer. 3)	Seedling selection made in Delaware, OH for DED tolerance by A.M. Townsend and L.R. Schreiber. Released 1995.	Moderate wholesale and mail order availability.	Of thousands of American elms screened by inoculation with the DED fungus, 'Valley Forge' was the most tolerant. Propagates easily. Form of young tree is sometimes difficult to manage.
New Harmony (Amer. 680)	Seedling selection made in Delaware, OH for DED tolerance by A.M. Townsend and L.R. Schreiber.	Low wholesale and mail order availability.	Of thousands of American elms screened by inoculation with the DED fungus, 'New Harmony' was the second most tolerant. Does not propagate as easily as Valley Forge, so is less abundant on the market.
Lewis & Clark 'Prairie Expedition'™	Origin is along Wild Rice River southwest of Fargo, ND. NDSU Research Foundation has released this elm for commercial production.	Starting in 2007	When inoculated with the DED fungus, this tree displayed high resistance. More info is available on the NDSU research foundation website at http://ndsuresearchfoundation.org/PrairieExpedition-RFM-37.htm
Jefferson (N3487)	Selected by the National Park Service in Washington, DC. Released for commercial production in 2005.	Starting, but still difficult to find.	Originally thought to be a hybrid between American elm (which is tetraploid) and unknown diploid parent. Recent DNA tests show it is fully of American elm origin. Description at http://www.ars.usda.gov/is/pr/2006/060613.htm?pf=1
American Liberty (W502, W503, W505, W507, W510, and M-8)	A collection of 6 clones selected by Dr. E. Smalley and Dr. R. Guries at the Univ of WI. 5 of the clones were derived from progeny of clones from WI & IA crossed with similar trees from Cornell University and USDA. Clone M-8 originated in Kansas.	Yes… through the Elm Research Institute (ERI).	In stringent trials conducted by the USDA ARS, the American Liberty multi-clone did not demonstrate high tolerance to DED, but ERI did not disclose the identity of the clones that were provided for the trial. Has shown some tolerance in other trials. W502 and W510 have performed well in some trials.
Independence (W510)	Patented tree, part of American Liberty multiclone. Originated from a controlled cross between 'Moline' (from Illinois) and 'W185-21' (from Iowa).	Yes, as part of American Liberty	Reportedly the most tolerant clone in the American Liberty multiclone.
Delaware 2 (Delaware)	Selected during the 1940's by the Bureau of Plant Industries, but never officially released. Origin of seed was North Dakota.	Not yet	Expressed significant tolerance in some studies, less in others.
R18-2	Originally selected by Cornell and the Boyce Thompson Institute.	Not yet	Susceptible to elm yellows. Was a parent in some of the clones included in American Liberty.
St. Croix	Selected from along the St. Croix river, near Afton, MN.	Not yet	Currently being tested by the University of Minnesota.

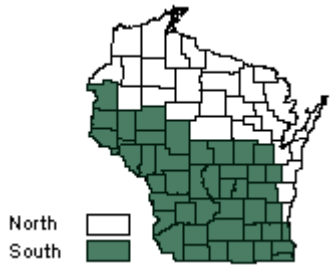
Oak wilt online tool updated – for those of you who use the oak wilt tool on our forest health website to help you make decisions on when to harvest, there is good news, the results page is now printable! If you've never used this tool you should! Go to http://dnr.wi.gov/forestry/fh/oakWilt/guidelinesform.asp and answer the 5 questions posed:

1. is oak wilt present in your county (map is included)
2. what time of year do you propose cutting
3. what is the BA of oak in the stand
4. general topography of the stand

5. general soil texture in the stand

After answering those question click Submit and a page will come up listing the risk rating, as well as including information about other time periods you might consider for a harvest and other harvest guidelines. This results page is now printable to be included with a management plan if you so choose.

Oak wilt and warm springs – although this has not turned out to be a particularly warm or early spring (unlike last year) I did get the traditional questions about the high risk time period for oak wilt and how it relates to weather. In the forested setting the DNR's message is that the high risk time period for the southern counties (in teal at right) is April 1 – July 15, and for the north it is April 15 – July 15. For the urban setting, DNR's message is "Don't prune oaks April through July" (some municipalities have oak wilt ordinances with different dates). But there have been some springs that were warm enough to see both fungal mat formation and beetle activities prior to April 1. So the question always arises whether those dates can be "fudged" if it's a particularly warm or cold spring. Recent research by Dr. Jenny Juzwik, USDA Forest Service Forest Pathologist, showed that 7 consecutive days of ~60F temp encouraged beetles to come out of overwintering sites. It seems that fungal mat formation precedes beetle activity. So, one should consider stopping pruning prior to April 1, if the daytime temp reaches ~60F for 7 consecutive days before that time. This rule of thumb should <u>not</u> be used to continue pruning after 4/1 due to a cold spring, so during a cold spring, the dates stand.



Sudden oak death online meeting – although we have not confirmed Phytophthora remorum, which causes Sudden Oak Death, in Wisconsin, some of you may be interested in learning more. An online meeting titled Sudden Oak Death/Phytophthora ramorum: A Global Perspective on Management and Movement will take place this spring. On both Wednesday, May 25, 2011, and Wednesday, June 1, 2011, hour-long webinars on a variety of topics relevant to Phytophthora ramorum and Sudden Oak Death will be offered.

- Session 1: Virtual "Field Trip" of Phytophthora ramorum Wildland Management
  Wednesday, May 25, 2011 – 9 am PDT; 10 am MDT; 11 am CDT; 12 EDT
    - P. ramorum on Japanese larch in the UK – Joan Webber, Forest Research; Surrey, UK
    - Sudden Oak Death hotspots in Humboldt County – Yana Valachovic, UC Cooperative Extension Humboldt and Del Norte Counties; Eureka, CA
    - Eradication and containment in Oregon – Alan Kanaskie, Oregon Department of Forestry; Salem, OR
- Session 2: Focus on Phytophthora ramorum Pathways
  Wednesday, June 1, 2011 – 9 am PDT; 10 am MDT; 11 am CDT; 12 EDT
    - An update on P. ramorum-positive water in western North America – Gary Chastagner, Washington State University Extension; Puyallup, WA
    - An update on P. ramorum-positive water in the southeastern United States – Steve Oak, USDA-Forest Service, Forest Health Protection; Asheville, NC
    - Challenges of repeat nurseries – Steve Jeffers, Clemson University, South Carolina

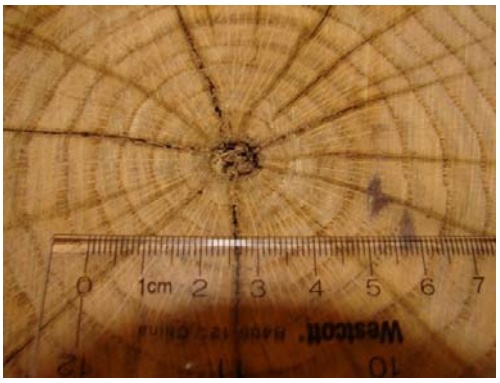
While these sessions are free, advance registration is required. Further details on the agendas and registration are provided online at http://www.suddenoakdeath.org/news-and-events/comtf-2011-meeting/ Target audience: Forest health specialists, land managers, regulators, nursery industry representatives, tribal members, arborists, researchers, Master Gardeners and other interested parties.

Other/Misc.

DNR's Urban Forestry program is hiring two limited-term employees in Green Bay and Fitchburg. For more information, visit: http://www.dnr.wi.gov/employment/. Click on Limited Term Employment, then on the left side of the page click Job Openings. Application deadline is May 4.

Squirrel damage on sugar maple – I included a piece on squirrel damage in last month's update as well, but since then have had numerous reports from around the region that squirrel damage on sugar maples is at an all-time high this year. Squirrels eat the bark off branches in the crowns of trees, and really enjoy the sweeter bark of sugar maples. These de-barked branches may be girdled if the damaged area surrounds the branch, or multiple spots of damage on a single branch can cause some dieback. This dieback may not show up for a year or two, depending on the health of the tree and the severity of the squirrel damage.

Spider heart or star shake in oak – sometimes referred to as "spider heart", or in the literature as star shake, heart cracks, or star cracks, this defect consists of cracks on the inside of the tree that run perpendicular to the annual rings but generally do not extend to the outside of the tree. It appears, based on the literature that I was able to find, that this is caused by bacterial infection of the wood creating weakness in the wood and allowing the cracking.



Cracks in the wood of oak running perpendicular to the annual rings, referred to as spider heart.

Dr. Alex Shigo made the observation that spider heart is a common feature in forest trees, especially white oaks. As the first crack forms, other cracks form that equalizes the loading. Rarely will there be only one major crack or seam in a forest tree. Wetwood lubricates the cracks.

In a paper written at our own Forest Products Lab here in Wisconsin the authors concluded that deformities like spider heart are probably attributed to bacterial infections in the tree (http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/5584/Look_Result_ocr.pdf?sequence=1)

In a Forest Products Laboratory research paper from 1972 (FPL 165) http://babel.hathitrust.org/cgi/pt?id=mdp.39015018194772;page=root;view=image;size=100;seq=3 the authors state: The central hypothesis is that certain bacteria which can live in the heartwood of living trees will produce enzymes capable of degrading the compound middle lamella (a combination

of the intercellular substance called the true middle lamella and the adjoining primary cell walls) of wood during early stages of infection. Thus, in the standing tree this middle-lamellar weakening predisposes the wood to shake formation from growth stresses, bending action of the wind, or freezing of capillary water within the degraded compound middle lamella.

And later in the above document it says: As previously mentioned, our field observations suggest that the bacteria responsible for rancid heartwood are quite likely to become established in the tree from injuries to the roots and root collar. Stem- and root-boring insects commonly cause these injuries, but wet poorly drained soils may contribute to direct bacterial invasion from the soil to the roots. Thus it is not unusual on certain sites for vigorous, apparently high quality red oaks to have rancid heartwood in the valuable butt log. With time, rancid heartwood is invariably followed by shake … … excessively moist soil conditions also seem to be associated with red oak trees that have a high incidence of rancid heartwood …

So now you have as much information as I do about spider heart! I couldn't find any management options, or any easy ways to identify external signs that may indicate spider heart is present, but if I do I'll share them in future updates.

Storm damage – a number of counties around the state experienced storm damage with the severe storms on April 10. Hail, wind, and tornadoes impacted hardwood and conifer stands around the region. There are a lot of things to take into consideration when addressing storm damage and there are too many to cover in depth here. If you have questions about any of the following issues please drop me an email including your circumstances related to the storm and I'll try to address them for you. Some storm topics include:

- Oak wilt issues – high risk time period extends to July 15, delay cutting until after that
- Annosum preventative treatments are recommended if you're harvesting conifers
- Move pine quickly to avoid bark beetle problems
- Hardwood salvage can usually wait longer than pine salvage
- Staining of damaged wood
- Hail damage in pine can allow Diplodia to cause significant needle and twig mortality
- Hail damage to other species can cause wounds on main stem and branches
- Damage to young trees can be more severe than the same damage to older trees

And always remember, safety first. Cracked, leaning and otherwise compromised trees should be dealt with by professionals trained in hazard tree removal.

Report EAB:

by phone 1-800-462-2803

by email DATCPEmeraldAshBorer@wisconsin.gov

visit the website http://emeraldashborer.wi.gov/

Report Gypsy Moth:
by phone at 1-800-642-6684
by email dnrfrgypsymoth@wisconsin.gov
visit the website http://www.gypsymoth.wi.gov/

Northeast Region Pest Update produced by:

Linda Williams
Forest Health Specialist
Wisconsin Department of Natural Resources - Northeast Region
Linda.Williams@wi.gov
http://dnr.wi.gov/forestry/fh/

For more information contact:

Bill McNee
NER Gypsy Moth Suppression Coordinator
920-662-5430
Bill.McNee@wi.gov

Linda Williams
NER Forest Health Specialist
920-662-5172
Linda.Williams@wi.gov

Note: This pest update covers forest health issues occurring in Northeastern Wisconsin. This informal newsletter is created to provide up-to-date information to foresters, landowners, and others on forest health issues. If you have insect or disease issues to report in areas other than northeastern Wisconsin please report them to your local extension agent, state entomologist or pathologist, or area forest pest specialist.