SCR & SER Forest Health Update

Wisconsin DNR, Forest Health Protection Unit

July 21, 2009 Vol. 6 No. 4

Topics in this update

Gypsy Moth Update - Mark Guthmiller

Life stage update

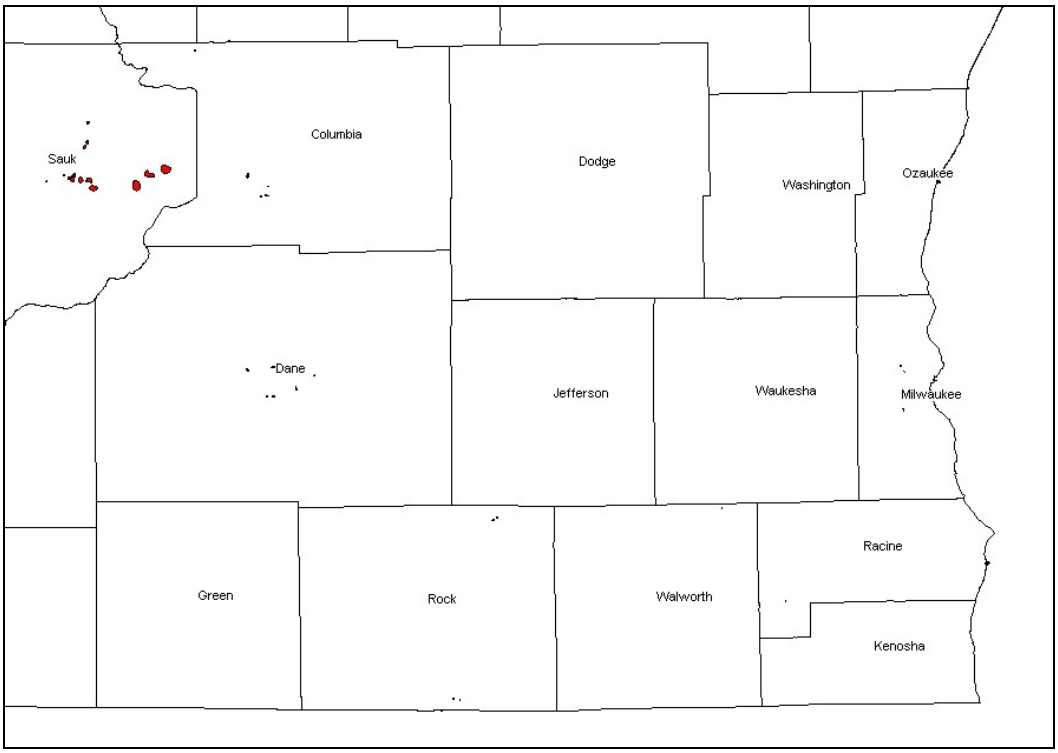
Gypsy moth caterpillar feeding damage is winding down for the year in southern Wisconsin with most caterpillars having pupated. Adult moth emergence is under way and folks should start noticing the large white flightless female moths on the underside of limbs or bark crevices laying eggs. The brown adult males may be observed during the day flying around the base of trees in search of the females.

Entomophaga maimaiga reports

The cool wet spring weather took a toll on gypsy moth caterpillars in parts of southern Wisconsin this year. We had reports and observations of the caterpillar fungal disease, *Entomophaga maimaiga,* from Dane, Kenosha, and Sauk Counties. When killed by the fungal disease caterpillars can be observed hanging head down on tree trunks. The caterpillar NPV virus is almost always found with these fungal disease outbreaks with caterpillars affected hanging in an inverted "V" shape.

Preliminary Aerial defoliation survey results

Aerial surveys conducted this year detected scattered areas with small patchy pockets of defoliation. One exception was Sauk County with preliminary results of approximately 2,368 acres observed in the Baraboo hills area with light to moderate defoliation. Statewide preliminary data indicates approximately 3,583 acres of defoliation observed. Preliminary statewide defoliation survey results: Columbia- 80 acres, Dane-100 acres, Kenosha- 3 acres, Marinette- 634 acres, Marquette- 306 acres, Milwaukee- 5 acres, Racine- 3 acres, Rock- 23 acres, Oconto- 54 acres, Sauk- 2,368 acres, Walworth- 1 acre, Waushara- 6 acres.



Map of observed defoliation in southern Wisconsin

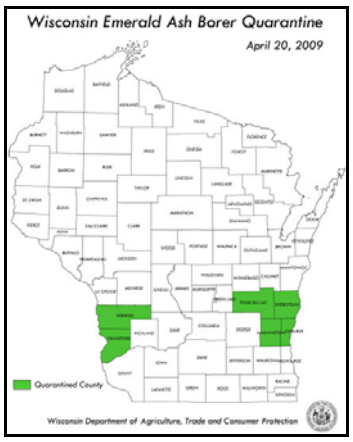
EAB updates - Bill McNee

(excerpt from the NER Forest Health Newsletter)

EAB confirmed in Crawford County

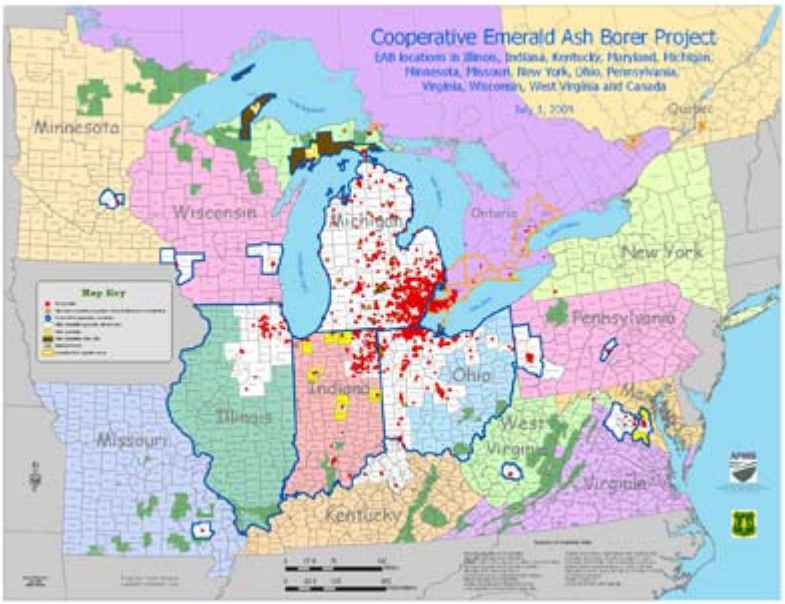
EAB has been found in Crawford County. The beetles were recovered from a purple panel trap (right) approximately 1/4 mile south of the Vernon-Crawford County line and about 5 miles southeast of the infestation at Victory in Vernon County. This trap is within the Victory delimitation zone, so this find is probably part of the larger Victory infestation and not an isolated, additional infestation.

Six Wisconsin counties are now quarantined for EAB: Crawford, Fond du Lac, Ozaukee, Sheboygan, Vernon and Washington. A current statewide quarantine map has been produced (right) and is available at: http://www.emeraldashborer.wi.gov/article.jsp?topicid=20. Residents and affected businesses in these counties are restricted from moving any hardwood firewood, ash nursery stock, ash logs or ash lumber out of the quarantine areas. Questions about compliance agreements to move quarantined articles can be directed to Bob Dahl at DATCP (608-224-4573 or Robert.dahl@wisconsin.gov) or JoAnn Cruse at APHIS (608-231-9545 or Joann.m.cruse@aphis.usda.gov).



EAB found in NY State

New York state has become the latest state to find emerald ash borer. The pest was detected near Randolph, which is about 50 miles south of Buffalo. NY is the fourth state to find EAB so far this year. MN, IA, and KY are the others. More information about the infestation in NY can be found at http://www.dec.ny.gov/press/55725.html.



Emerald ash borer map of infestation as of July 1, 2009

Oak tatters and herbicide damage

Tattered or shredded appearance on oak leaves (Photo taken on June 22, 2009)

Tattered symptoms on oak leaves were observed on a forest stand near a corn field in Grant County in June. Affected oak leaves were showing tattered, shredded or skeletal look due to reduced interveinal tissues. Other deciduous trees, such as ash, boxelder, hickory, and walnut, were also affected; however leaf symptoms were different. The leaves of these species appeared cupped or curled, instead of tattered. Some oak leaves also appeared cupped. A second set of leaves started to be produced on heavily damaged trees.

Cupped or curled appearance on oak leaves (Photo taken on June 22, 2009)

It is suspected that these leaf symptoms were caused by herbicide drift. Herbicides including 24-D, acetochlor, and atrazine were applied to the adjacent corn field on May 17, 2009. Damage on leaves became apparent by early June. Foliage samples were collected and sent to a lab in South Dakota in early June. The lab analysis detected the residues of the above three chemicals from the samples.

Oak tatters was first reported in the 1980's in Iowa, and has been observed throughout the midwestern United States. The cause of oak tatters is still uncertain. However, recently, herbicide drift is becoming a major suspect of oak tatters. Experiments conducted by the University of Illinois, using two-year-old potted white oak seedlings revealed oak tatters symptom on trees that were treated with metolachlor and acetochlor+atrazine, at leaf unfolding stage. The results indicate that drift of chloroacetamide herbicides could be a possible cause of the oak tatters. Symptoms of herbicide damage by 24-D include twisting, cupping, and formation of narrow, strap-like leaves.

Pest alert: Oak tatters is available through the US Forest Service website at http://www.na.fs.fed.us/spfo/pubs/pest_al/oaktatters/oaktatters.htm. For more information about oak tatters, please visit http://dnr.wi.gov/org/land/Forestry/Fh/fhissues/tatters.htm.

This spring, oak tatters was also reported in Green County. Thank you to the DNR foresters, Matt Singer and Ray Amiel, for investigating the problems.

Hickory mortality

The DNR forester, Mike Finley reported mortality on bitternut hickory in Richland County in June. Another DNR forester, Randy Cooper recently mentioned that he had started to see mortality on bitternut hickory in Walworth County since last summer.

Dieback and mortality on hickory continue to be a problem throughout the natural range of bitternut and shagbark hickory in Wisconsin. The symptoms progress rapidly from thinning crowns to branch mortality to complete tree mortality. Epicormic branches often sprout from the main stem only to wilt and die later and sunken cankers or bleeding cankers can often be found on main stems of these trees. Dieback and mortality occur on both bitternut and shagbark hickory, although mortality appears to be more prevalent on bitternut hickory.

Historically, hickory mortality was attributed to attacks by the hickory bark beetle (*Scolytus quadrispinosus*) following periods of drought. More recent research, however, indicates that hickory mortality is due to a complex of biotic and abiotic factors, including the hickory bark beetle and other insects, and the fungus *Ceratocysis smalleyi,* and other fungi. Based on the recent research studies by the USDA Forest Service (2006-2008), the most common scenario seems to be as follows; 1. Stressed hickories are attacked by hickory bark beetles, some of which carry spores of *C. smalley*i; 2. The fungus, *C. smalleyi* causes diffuse cankers, and further stresses the trees; 3. Further stress stimulates additional bark beetle attacks; 4. The tree finally dies. Though less frequent, other fungi, such as *Fusarium* sp. and *Phomopsis* sp. were also isolated from some symptomatic wood samples. The pathogenicity test of the 3 fungi (*C. smalleyi, C. caryae, F. solani*) was conducted in 2007-08 by inoculating fungal solution to a wound of pole-size bitternut hickories, and *C. smalleyi* showed much higher virulence than the rest. The investigation of this problem by the Forest Service will continue in 2009.

A USDA Forest Service factsheet is available at
http://na.fs.fed.us/spfo/pubs/pest_al/hickory/hickory.htm.
A WI DNR factsheet about hickory mortality is at
http://dnr.wi.gov/forestry/fh/pdf/HickoryMortalityFactsheet.pdf.

The Japanese beetle adult
Photo: David Cappaert,
www.forestryimages.org

Japanese beetle skeltonizing leaves

Infestations by the Japanese beetle (*Popillia japonica*) on birch and many other plant species were observed in SCR/SER. The beetles were feeding on leaves, causing skeltonizing or lacy appearance on leaves. The Japanese beetle feeds on the leaves and flowers of over 300 plants. Preferred tree species include birch, Japanese and Norway maples, crab apples, lindens and mountain ash.

As the name implies, the beetle is native in Japan, and was first found in the US in New Jersey in 1916. It is believed that larvae of the Japanese beetle were accidentally introduced to the United States with a shipment of iris bulbs from Japan.

The Japanese beetle adult is about 3/8 inch long, and metallic green with copper-brown wing covers. There are six pairs of white tufts of hairs along the sides and back of the body. Adults are found from mid June to mid September. Population peak starts around mid-July and lasts for 4-6 weeks as individual beetles live about 30-45 days. The immature form of the Japanese beetle is a white grub and feeds on the roots. The Japanese beetle overwinters as a grub in the soil. For grub control, a soil drench application of imidacloprid and thiomethoxam in mid to late June can be effective. The Japanese beetle has one generation per year.

If they are in low numbers, adults can be removed by hand picking. Traps are effective to capture beetles, however, these traps may attract more beetles to your property. Insecticides, such as carbaryl, malathion, cyfluthrin, and permethrin, can be sprayed to control the adult beetles. Repeated applications may be necessary on a weekly basis when adult population is high. Always follow label directions.

For more information about the biology and management of the Japanese beetle, please visit the University of Wisconsin Extension at http://wihort.uwex.edu/gardenfacts/X1062.pdf and the University of Minnesota Extension at http://www.extension.umn.edu/distribution/horticulture/dg7664.html.

Jumping oak galls on oak leaves

Small pinhead-size round galls on the underside of the leaves (photo take non July 17, 2009)

Galls were seen on the leaves of bur and white oaks in Dane, Richland, and Sauk Cos. The jumping oak gall is caused by the gall wasp, *Neuroterus saltatorius*. Infestation on leaves causes discoloration on the leaf surface. Heavily infested leaves may prematurely fall. On the underside of the leaves, small pinhead-size round galls are seen on a saucer-like depression.

The jumping oak gall has two generations per year. The first generation wasps emerge from last year's galls in the spring. They are all female and lay eggs on newly expanding leaves. The eggs hatch into both male and female as a second generation. They mate, and females lay eggs on leaves. These galls fall to the ground when mature, and overwinter. Each gall contains one insect.

Sometimes heavy infestations are observed on some trees while neighboring trees are much less affected. It is believed that the difference in the level of infestation by the jumping oak gall has much to do with the timing of bud opening. Infestations by the jumping oak gall are not considered to cause any long-term negative effect on the health of the trees, and control is not necessary.

They received the name "jumping-oak gall" because these galls "jump" or bounce on the ground when the galls fall to the ground. If you want to see them jump and dance, please check it out at this website - http://www.youtube.com/watch?v=iyuSb2jH7jg. Jane, thank you for forwarding this website!

White pine needle chlorosis

White pine needles are light green to yellow, though the tree sustains full crown (Photo taken on June 1, 2009

Chlorotic needles on white pine were observed in Jefferson County this spring. Chlorosis was often seen on the entire crown. Some severely affected trees were attacked by a bark beetle, *Pityogene* spp. and some opportunistic wood borers. Trees infested with bark beetles were showing top dieback, and some trees were dead. Many exit holes were found on dead trees, and when the bark of recently killed trees was peeled, feeding galleries of bark beetles and wood borers were prominent.

This problem is much more commonly observed in a site with heavy soil containing a high percentage of clay, and/or poorly drained soil. The value of soil pH is usually high. One site that was recently visited had pH=7.8. The optimal pH value for white pine is believed to be within the range of 5-6.5. Although the level of nutrients available in soil was either optimum or high, foliage test from this site revealed that the foliage lacked in several nutrients and micronutrients, such as Zinc, Manganese, and Copper. In particular, the level of Manganese in foliage was extremely lower than the normal range.

Deficiency in Nitrogen, Calcium, Zinc, Boron, Manganese and Copper causes chlorosis and/or diminished foliage size. It appears that chlorotic and shorter needles were caused by nutrient deficiency. However, based on the soil analysis, soil contained optimum or high level of these nutrients. It is suspected that nutrient deficiency was not due to lack of nutrients in soil but the absorption of nutrients was interfered due to high pH. This type of nutrient deficiency is particularly common when the pH is higher than 7.3. Elements that are less available at high pH levels include Boron, Iron, Manganese, and Zinc. In southern Wisconsin, chlorosis tends to show up after a heavy rainfall, especially in sites with lime bedrock. In the site in Jefferson County, the chlorosis started to appear in late last summer. It is likely that the nutrient deficiency was enhanced by heavy rainfall in the spring of 2008.

One of the management options to remedy the problem is to apply iron sulfate to bare soil under the tree canopy in the fall in order to help acidify soil. However, this treatment will be laborious and expensive, and not practical in the forest setting. The good news is that the landowner recently reported that the symptomatic trees look more greenish than one month ago, possibly due to the drier weather.

Leaf samples suspicious of bacterial leaf scorch needed

Leaves that are infected with bacterial leaf scorch may appear like these on this photo.

Dr. Gerry Adams of Michigan State University solicits samples from Wisconsin to detect bacterial leaf scorch (BLS) this summer. This is a great opportunity for us to learn more about the distribution of this disease in Wisconsin! Please be on the look out for the disease, and if you find suspicious foliage that you would like to be tested, please contact Kyoko Scanlon at 608-275-3275, or contact Dr. Gerry Adams directly. He can be reached at gadams@msu.edu or at 517-355-0202. Sampling can start in July till leaf fall.

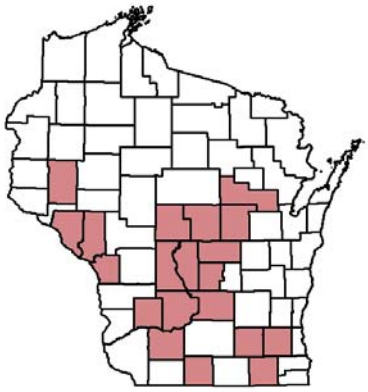
Bacterial leaf scorch (BLS) is caused by a bacterium (Xylella

fastidiosa). Hosts include oak, maple, elm, ash, mulberry, and other deciduous trees. Infected leaves exhibit scorch symptoms with irregular margins. The pathogen is transmitted by xylem-feeding insects, such as leafhoppers and treehoppers. The disease has been found throughout the east, southeast, and some mid-west states, including Nebraska, Missouri, and Illinois. Last year, out of 11 sites where samples were collected, two bur oak samples from one site in Dane County came back positive for BLS. This was the first confirmation of BLS in Wisconsin. The samples that were positive last year in Wisconsin exhibited the leaf symptoms quite different from what we see in some BLS factsheets.

Though we don't have a photo of the exact samples, the photo above should be somewhat similar. More information about this disease and the survey is available at the Forest Service website at http://www.na.fs.fed.us/fhp/bls/.

Thank you for your cooperation to this project!

Annosum root rot update



County distribution of Annosum root rot (As of July 21, 2009)

Annosum root rot was recently found in a red pine plantation in Shawano County near Waupaca County. This is the first find of Annosum in Shawano County. This will bring the number of Annosum confirmed counties to be 20 in Wisconsin. Annosum root rot, caused by the fungus, *Heterobasidion annosum* was first identified in Wisconsin in 1993 and is considered among the most important and destructive diseases affecting conifers in the north temperate regions of the world.

Two products are currently available in Wisconsin to prevent Annosum root rot. Sporax (sodium tetraborate decahydrate) is granular and can be applied using a salt-shaker style container or a of a PVC pipe and a plastic nozzle. Cellu-Treat (disodium octaborate le powder and can be applied using a backpack sprayer or an attachment to a harvester. A revised double-sided factsheet about Annosum root rot is available at http://dnr.wi.gov/forestry/Fh/annosum/pdf/ARRfactsheet.pdf. The factsheet describes biology of the disease and prevention, including where to obtain chemicals and other practical information.

One of the questions related to a fungicide treatment to prevent Annosum root rot is “How much does it cost?” A study was conducted in Menominee Forest to calculate the cost of fungicide application last summer. In this study, stumps were treated manually by a forester using either a dispensing unit for Sporax or a backpack sprayer for Cellu-Treat. Based on the results, in row thinned stands, the treatment roughly cost $23/acre for Sporax, and $13/acre for Cellu-Treat. In selectively harvested stands, the treatment roughly cost $16/acre for Sporax and $8/acre for Cellu-Treat. The cost included labor to perform applications ($20 per hour plus benefit = $26/hr), but didn’t account for travel time to the site or time for clearing slash. Average cost of the material was $9.3/acre for Sporax and $1.1/acre for Cellu-Treat in row thinned stands, and $3.8/acre for Sporax and $0.6/acre for Cellu-Treat in selectively harvested stands. If you are interested in the full report of this study, please contact Kyoko Scanlon at 608-275-3275 or at Kyoko.Scanlon@Wisconsin.gov.

Please report to us

We appreciate reports of forest health problems in your areas. Currently, there is no regional forest health specialist assigned in SCR or SER. At this point, please contact the following staff for regional forest health problems/questions. Thank you.

For general forest health issues

Jane Cummings-Carlson (northern part of SER)	608-275-3273
Kyoko Scanlon (southern part of SER, and SCR)	608-275-3275

For gypsy moth

Andrea Diss (Statewide issues)	608-264-9247
Mark Guthmiller (SCR/SER)	608-275-3223

Emerald ash borer hotline	1-800-462-2803
Emerald ash borer e-mail	DATCPEmeraldAshBorer@wi.gov
Gypsy moth hotline	1-800-642-MOTH

Forest Health web site: http://www.dnr.state.wi.us/org/land/forestry/FH/
Gypsy Moth web site: http://www.gypsymoth.wi.gov
Emerald ash borer web site: http://www.emeraldashborer.wi.gov/

About the newsletter

"SCR & SER Forest Health Update" is an informal newsletter created by the Wisconsin DNR, Forest Health Protection Unit. The purpose of this newsletter is to provide foresters in the South Central Region and Southeastern Region with regional up-to-date forest health information. This newsletter will be issued monthly during the growing season and on an irregular basis during winter as topics come up. We welcome your comments/suggestions on this newsletter and your reports on forest health problems you observed in your area. If you would like to subscribe to this newsletter, please contact Kyoko Scanlon at Kyoko.Scanlon@wisconsin.gov.

Previous issues of this update and regional forest health updates from NER, NOR and WCR, are available from the WI DNR Forestry website at http://dnr.wi.gov/forestry/FH/intheNews/.
Articles were written by Kyoko Scanlon, unless otherwise noted.