

Southern Wisconsin Forest Health Update

Wisconsin DNR, Forest Health Protection Unit

December 18th, 2015 Vol. 12 No. 4

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Articles in this newsletter were written by Mark Guthmiller, Regional Forest Health Specialist, unless otherwise noted.

Emerald Ash Borer– Bill McNee

Since the last pest update, Jackson County had its first EAB confirmation. Six Wisconsin counties have had first EAB confirmations so far in 2015 (Green, Jackson, Lafayette, Marquette, Outagamie and Richland Counties). There have also been several recent community detections in counties where EAB had already been confirmed. Recent detections are in:

- Crawford Co. – Village of Gays Mills
- Dane Co. – Village of Brooklyn, Village of Cambridge, Village of Oregon
- Door Co. – Town of Sevastopol
- Green Co. – City of Monroe
- Jackson Co. – Black River Falls
- Ozaukee Co. – Village of Thiensville
- Rock Co. – City of Edgerton
- Waukesha Co. – Village of Eagle, Town of Delafield, Town of Genesee

EAB was also recently found in Dubuque, Iowa and Duluth, Minnesota (near the 2013 detections in Superior, Wisconsin). This is the first detection of EAB in northern Minnesota.

A complete list of community detections can be found online at:

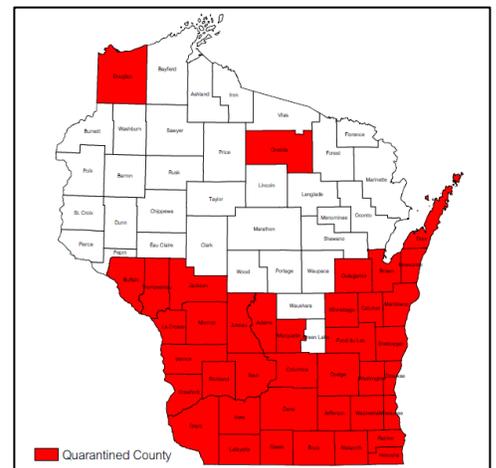
<http://datcpservices.wisconsin.gov/eab/articleassets/ConfirmedEABfindsInWisconsin.pdf>. To get the fastest updates on new EAB

detections, sign up for email notifications:

http://datcp.wi.gov/Gov_Delivery/EAB/index.aspx.



D-shaped EAB exit hole in the Town of Norway, Racine County. Photo by Bill McNee.



Current EAB quarantine area is shown in red.

If EAB has not already been found in a community or county, send reports of suspected infestations to the EAB website, www.emeraldashborer.wi.gov, using the “Report EAB” link. Submitting pictures of suspect galleries, exit holes, larvae or adult beetles to help facilitate such confirmations is greatly appreciated. A larva or adult beetle is needed for submittal to confirm EAB in a new county. DNR Forest Health Specialists, DNR Urban Forestry Coordinators, and UW Extension staff may also be able to assist with confirmations in new municipalities in already confirmed counties.

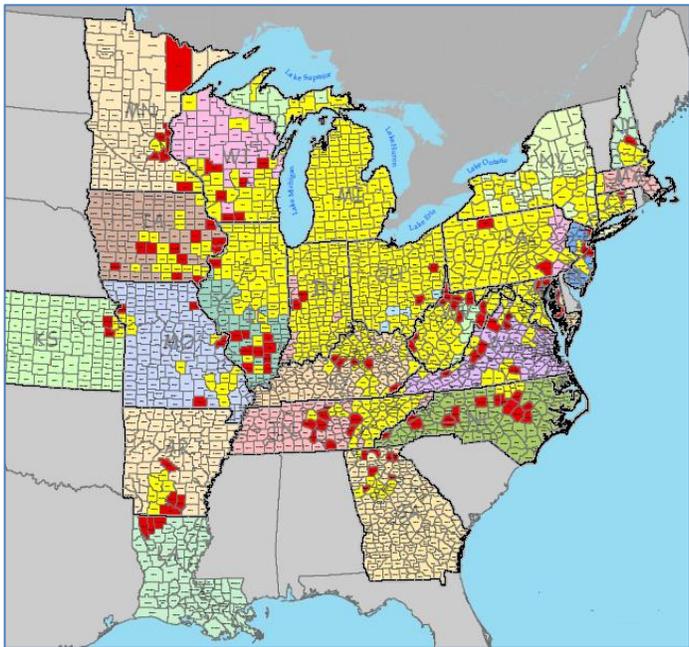


EAB larva showing “bell” shaped segments.
Photo by Brian Wahl.



Typical serpentine EAB galleries just under the bark. Photo by Mark Guthmiller.

Nationwide, 116 counties have had first EAB confirmations so far in 2015. This is about the same number as the same time last year, although the detections are continuing to be found farther away from the original Detroit-area introduction site.



Counties in red have had first EAB detections in 2015. Counties in yellow had earlier year detections. Modified from a map by USDA APHIS.



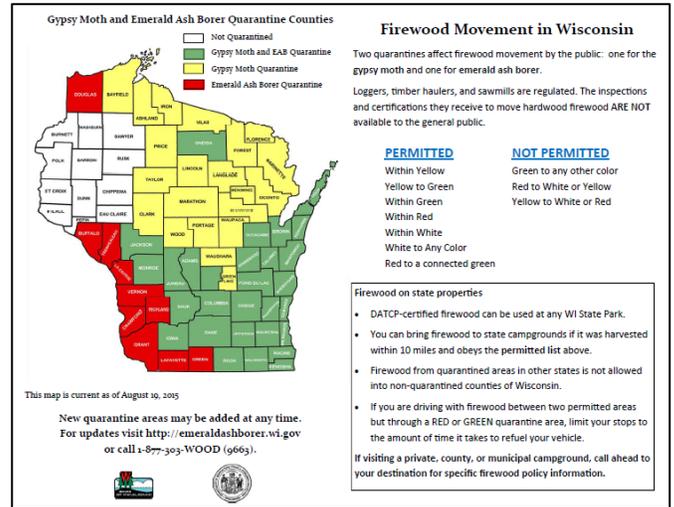
Woodpecker “flecking” of bark is a good indicator to take a closer look for EAB under the bark. Winter is a great time to watch for this. Photo by Bill McNea.

Firewood Movement:

It is a good idea to use firewood locally and not transport it a long distance. The risk of pest spread is reduced if using seasoned wood that has loose bark. An easy-to-use map of allowed firewood movement can be found here:

<http://datcpservices.wisconsin.gov/eab/articleassets/Firewood%20Movement%20in%20Wisconsin.pdf>.

Be aware that this map will change in response to future county detections.



Map of allowed firewood movement in Wisconsin as November 2015.

Gypsy Moth– Bill McNee

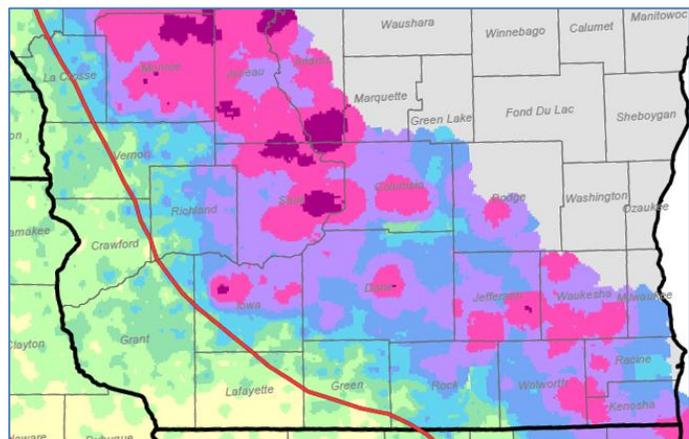
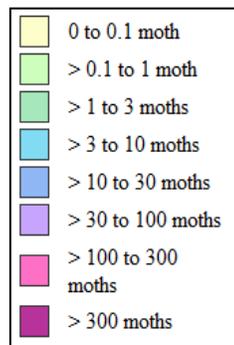
DNR staff received relatively few reports of nuisance caterpillars or egg masses in 2015. Localized or nuisance reports were received from Columbia, Dane, Jefferson, Rock, and Sauk Counties. Caterpillar disease was observed in many of these areas reducing populations in many instances. Winter into early spring is a good time to oil or remove egg masses. Information on oiling or removing egg masses is available at www.gypsymoth.wi.gov.

The DNR Gypsy Moth Suppression program received two requests for aerial spray treatments for the spring of 2016. Rock County has applied for a 22 acre treatment area, which is a smaller repeat treatment area in the Town of Beloit, where a residual damaging population remains from last year. Mirror Lake State Park, in Sauk County, has applied for an 85 acre treatment area targeting a damaging population in part of the camping area of the park.



Gypsy moth egg masses. Photo by Bill McNee.

Trappers from the Wisconsin Dept. of Agriculture, Trade and Consumer Protection (DATCP) have finished taking down their grid of gypsy moth traps, and about 97,500 male moths were caught. Catch numbers are about 5,000 moths higher than last year. The highest numbers of moths were trapped in Monroe County (15,465 moths) and Jackson County (7,707 moths).



Map of 2015 gypsy moth trap catches in southern Wisconsin, showing highest numbers in dark red. Gray areas were not trapped. The red line shows the east side of the slow-the-spread zone. Map from www.gmsts.org.

Oak Harvesting Guidelines Review Update

The DNR oak harvesting guidelines recently went through a review process. The updated guidelines, to minimize the oak wilt introductions and impacts to a forest stand, will be effective starting January 1st, 2016. The DNR forest health team will be looking for opportunities to offer training on the guide to facilitate proper implementation. Please contact Bill or myself if you have such an opportunity.

The revised guidelines are now available on line at:

<http://dnr.wi.gov/topic/ForestHealth/documents/OakHarvestingGuidelines.pdf>

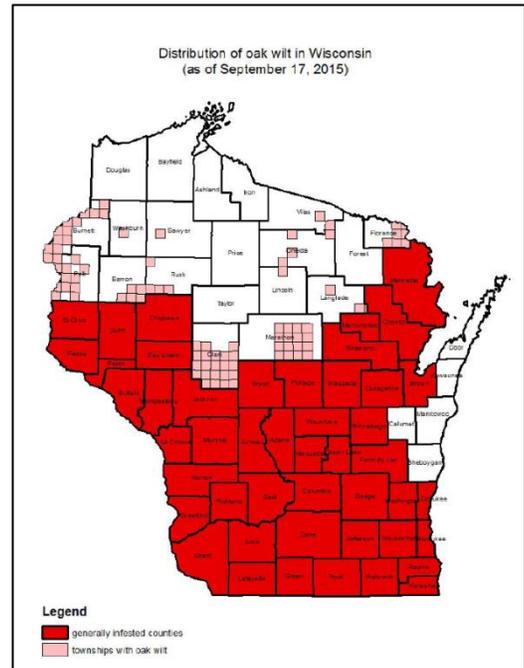
Heterobasidion Root Disease Confirmed in a White Spruce Plantation

Overview

Heterobasidion root disease (HRD) was confirmed in a white spruce plantation in the Southern Unit of the Kettle Moraine State Forest this year. HRD has previously been referred to as annosum root rot. While HRD has previously been confirmed on individual spruce trees in Wisconsin, this is the first confirmation within a spruce plantation in the state. While evaluating an adjacent red pine stand back in April, a white spruce plantation across the road was observed having some health issues. A brief investigation of the spruce plantation revealed some upper stem cankers along with some lower cankers at the base of a couple trees. The trees had bark cracks and extensive resin pitching at these canker sites. Samples were taken to investigate for canker fungi, such as phomopsis canker. Unexpectedly, a basal canker sample developed the classic “Oedocephalum” fruiting structures indicative of HRD. Fruiting bodies were not observed at the time of sampling the base of the tree, but HRD was not suspected as the cause at that time and stumps were not inspected.

After the positive lab result, a number of subsequent surveys were conducted in the summer and fall of 2015 to get some idea of the impacts of HRD to this white spruce stand. Fruiting bodies were commonly found on white spruce stumps and occasionally on “fader” and dead trees (fader trees: stressed, less thrifty looking trees with thin canopy, more yellowing needles, and often canker like wounds). There were scattered areas of the plantation that had higher mortality which appeared to be associated with high water table and for the most part we were not able to confirm HRD in these wet areas. These wet areas did have both standing and uprooted dead trees. In the slightly higher elevated areas of the stand is where stumps were commonly observed with HRD fruiting bodies. Although not as common as in the wet areas, on a few occasions we did find uprooted dead trees in these higher elevated areas with prolific HRD fruiting on the exposed roots. The summary of survey data will focus mainly on the slightly elevated areas where HRD was confirmed by conks on stumps or dead trees.

HRD has been previously reported in pine plantations in the Southern Unit of the Kettle Moraine State Forest. Although the adjacent red pine plantation to this spruce stand was not confirmed with HRD, a red pine stand about ½ mile away from this spruce stand has previously been confirmed with HRD. Conk samples from this spruce stand were sent to the Forest Pathology Laboratory at the University of Minnesota for molecular identification. Sequences obtained from the samples indicated the species impacting the spruce is



Distribution of oak wilt map in Wisconsin. Red counties are considered “generally infested” and the pink areas are known detections at the township level in a county.

Heterobasidion irregulare, the same species we see in our pine plantations in Wisconsin. For more information on HRD (annosum root rot) visit: <http://dnr.wi.gov/topic/foresthealth/annosumrootrot.html>

Stand History

The history of this white spruce stand includes stand establishment in 1965 and a thinning in the winter of 2004-05. Back in 2004-05 stump protection for HRD was not conducted on this spruce stand. This stand requires frozen ground to conduct harvesting activity and the stand is currently marked for another thinning with the contract running through June 12, 2016. The Southern Unit of the Kettle Moraine State Forest follows the annosum treatment guide recommendations that are currently in affect. For treatment guide information see: <http://dnr.wi.gov/topic/foresthealth/documents/AnnosumTreatmentGuide.pdf>

Looking at historical weather data between December 1st, 2004 and March 31st, 2005 from the Whitewater area (approximately 10 miles away from the stand) the data shows a total of 75 days above freezing when snow depth was 0.0” to only a trace (including 23 days in the 40s, 3 days in the 50s, 2 days in the 60s, and one day in the 70s). HRD spores are most commonly produced when temperatures are between 41-90 degrees F. so there were approximately 29 days of increased risk of spore production and infection to this stand in the winter of 2004-05. (weather data source: UW Madison Dept. of Atmospheric and Oceanic Sciences, <http://www.aos.wisc.edu>)

Survey Data

A number of days were spent surveying this stand to assess the level of infection and impact to the stand by HRD. Approximately 24 acres were accessible in this 30 acre stand. In this 24 acre area surveyed a total of 99 infected stumps were confirmed with HRD conks. There were 32 dead trees and 100 “fader” trees associated with these 99 confirmed stumps, ranging from 0-3 dead trees and 0-4 fader trees per infected stump. A total of 109 cankers were observed, ranging from 0-4 cankers per tree. A total of 40 of these were basal cankers with the remainder ranging from ½ foot up to 35 feet. We were able to confirm HRD in culture from a small subset of basal cankers and we are still evaluating some of the higher cankers to see if we can recover HRD. It is possible these higher cankers are not related directly to HRD infection but rather from other stress factors or secondary infections. As the data shows, unlike HRD in pine plantations, we did not see expanding pockets of mortality centered on an infection center (stump). With an occasional dead tree or fader tree associated with the stump infection there was not a dramatic visual impact of extensive mortality like we often see in pine plantations. While mortality in white spruce, at least currently, may not be as apparent as often observed in pine plantations, growth impacts could be substantial.

We took increment cores from a small sampling of “fader” trees and one apparent healthy tree. While the growth rates of all the “fader” trees were less than the apparent healthy control each year following the thinning harvest in the winter of 2004-05, the per year growth rates five years prior were also smaller on these fader trees. While HRD root infection may well be impacting growth rates it is hard to differentiate growth loss from such infections versus other factors, such as site conditions or individual tree competition based on this small sampling.

White Spruce Plantation- Southern Unit Kettle Moraine State Forest Increment Core Growth Readings (mm at dbh)													2005 was first year of growth post-thinning harvest.			
Tree	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Healthy Control	2.5	2	2	3	3	4	5	4	5	5	4	5	4	4	4	7
Fader 1	1	1.5	1	1.5	1	1	2	1	3	1.5	2	2	2.5	2.5	2.5	3
Fader 2	1	1	1	1.5	1	2	2	1.5	2	1.5	1.5	2	2	1	2	1
Fader 3	1	0.5	1	1	1	1.5	2.5	1.5	3	1.5	2.5	3.5	3	2	2.5	3
Fader 4	1	1	1	1.5	2	1	2	2	2	2	2	2.5	2	3.5	4	2

Observations

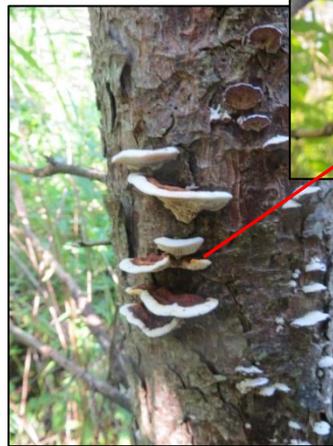


Top left clockwise: Typical basal and lower trunk cankers observed; Two uprooted trees with HRD conks; Close up of conks on underside of root plate of tipped tree. Photos by Mark Guthmiller.

Top left clockwise: Spruce stump with HRD conks; Underside of HRD conk; Close up of “angular” pore surface of HRD conk; Old and new white pore growth of an HRD perennial conk. Photos by Mark Guthmiller.



Cankers were observed up to 35' in some trees adjacent to stumps confirmed with HRD conks. It is uncertain if these upper cankers are related to HRD. Photo by Mark Guthmiller.



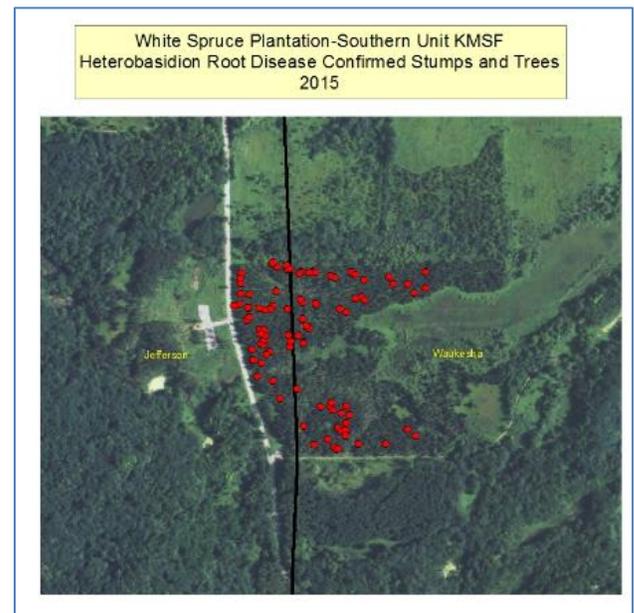
CAUTION: HRD conk look-a-like. These 4 photos are of the “yellow-red gill polypore”, *Gloeophyllum sepiarium*, a brown rot saprobe. They were periodically observed on old dead spruce. Note the gilled undersides versus angular pores of HRD. Photos by Mark Guthmiller.

Thanks to Kyoko Scanlon, Bill McNee, Tom Hinsenkamp, and Mike Sieger for assistance with surveys, lab culturing, site history information and tree cutting to evaluate the spruce stand. Thanks also to the Forest Pathology Laboratory at the University of Minnesota for molecular identification assistance.

Walnut Twig Beetle and Thousand Cankers Survey

Walnut twig beetle, *Pityophthorus juglandis*, is a very small beetle native to the southwest US and is the main vector of thousand cankers disease of black walnut. To date, Wisconsin has not found walnut twig beetle or thousand cankers disease, caused by the fungal pathogen, *Geosmithia morbida*. In 2015, Forest Health staff continued monitoring for the beetle and disease in southern and west central Wisconsin. Thirty-five Lindgren funnel traps were placed in 11 counties, primarily at state park and wildlife properties and a few county park properties (Figure 16). Traps were checked and samples collected twice during the growing season. No suspect beetles or fungal cultures were found during sample screening.

Additional trapping for walnut twig beetle was conducted by staff from the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP), primarily at municipal wood waste sites and sawmills. A combined total of 63 traps were placed at 33 sites by both agencies.



DNR walnut twig beetle trap locations in 2015.

Phytoplasma (Yellows) Sampling Results

Phytoplasmas are wall-less, bacteria-like microorganisms that act as pathogens in infected trees, which symptoms may include small and yellow foliage, slow growth, thin crowns, branch dieback and vertical bark cracks. Infected trees and stumps may sometimes produce clusters of spindly shoots that are known as a “broom”. The phytoplasma-caused disease on ash is known as ash yellows, and mortality of infected white ash has been observed in forested settings. Phytoplasma has also been detected in recent years in Wisconsin from other tree species, such as black walnut and butternut based on test results using Polymerase Chain Reaction (PCR). In 2015 we sampled a number of other tree species to test for phytoplasma.

In 2015, 30 samples were collected from various tree/shrub species to test for phytoplasma using PCR. All of the trees sampled exhibited one or more symptoms that were characteristic of phytoplasma infection. Besides ash, phytoplasma was detected on red maple, shagbark hickory, and bitternut hickory for the first time in Wisconsin. In some but not all cases these newly confirmed host species were in proximity of ash trees confirmed with yellows. The effect of phytoplasmas on the health of these newly confirmed tree



Classic ash yellows “broom” with stunted and chlorotic leaves. Brooms are more common on green ash but rare on white ash. On white ash, once cut, stumps often develop brooms. Photo by Mark Guthmiller.

species in Wisconsin is unknown. Further monitoring and evaluating will be needed to assess impacts to these tree species. Samples were also collected in 2015 from Amelanchier sp., river birch, hackberry, bur oak, white oak, and silver maple, but the results were negative for phytoplasma. Phytoplasma was also detected for the first time in Rusk County this year on black ash.

Observations



A private woodlot in Rock County had a number of shagbark hickory trees exhibiting some strange growths. The first two pictures show a phytoplasma positive shagbark hickory exhibiting broom like growth. The photo on the right with the odd growth on the trunk was also tested but came back negative for phytoplasma. A leaf spot fungus may be involved with this growth. See the August edition of this newsletter for more information related to this. Other than the browning shoots, no dieback or mortality was observed on these shagbark hickory trees. Phytoplasma (ash yellows) was also confirmed on white ash in this stand and causing dieback and mortality.



This shagbark hickory stump with sprouts exhibiting chlorotic, elongated and stunted leaves was observed at a DNR wildlife area in Columbia County. The foliage was tested and confirmed positive for phytoplasma. Photo by Mark Guthmiller

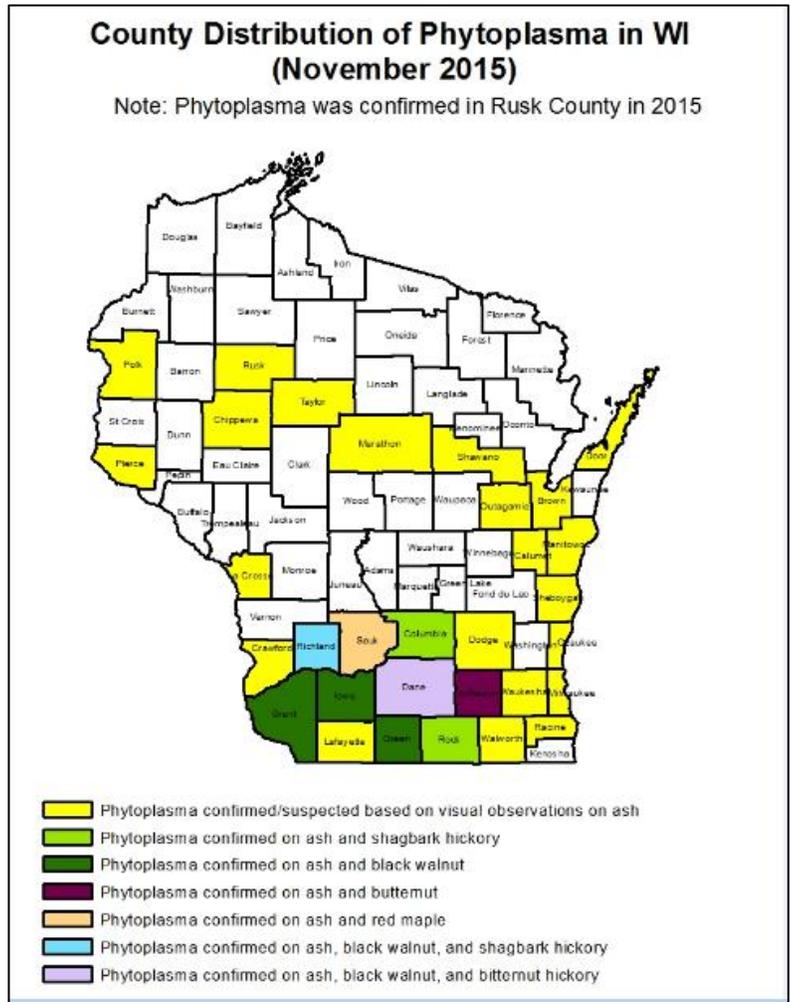


A deer browsed shagbark hickory seedling in Richland County was observed with chlorotic and stunted growth. Foliage was tested and confirmed with phytoplasma. Phytoplasma has been confirmed on white ash in this private woodlot causing dieback and mortality. Photo by Mark Guthmiller.

A stand of bitternut hickory at a state park in Dane County has been experiencing extensive dieback and mortality attributed to "100 cankers" disease (hickory bark beetle and *Ceratocystis* canker fungi). Phomopsis galls are also extensive in this stand. A number of bitternut hickory were also exhibiting chlorotic and stunted epicormic shoots shown here that were tested and confirmed positive for phytoplasma. Photo by Mark Guthmiller.



Red maple stump sprouts exhibiting phytoplasma symptoms with stunted, elongated and chlorotic foliage. Three sites in Sauk County tested positive for phytoplasma on red maple. Photo by Mark Guthmiller.



Miscellaneous Topics and Observations



Dane County UW Extension Winter Seminar Series

Dane County UW Extension has set their winter seminar series including sessions on insects and diseases. The various sessions are scheduled on Thursdays in January. For more information visit:

<http://dane.uwex.edu/2015/12/15/2016-winter-seminar-series/>

Butternut Woollyworm

Back in August I had a rural property owner in Dane County bring in a jar with black walnut leaves being defoliated by some strange fluffy white critter. The landowner's concern was having whatever this was getting into his nearby garden. I had not seen this before and took it to the lab to look under the scope. After cleaning off the woolly growth (flocculence) it was apparent that it was a larva of some kind of sawfly. After checking the literature, it appears to be the butternut woollyworm, a mid to late summer defoliator. There is very little written on this critter but it sounds like its range is fairly wide including the northeast United States and Canada. There was mention of this critter showing up in Alabama in the 70's, which might have been expanding its range to the south. Overall, it does not sound like it is a major pest to be concerned about as infestations appear to be localized when they occur and late season damage to foliage has little impact to the trees. Butternut, black walnut, and hickories are listed hosts. It has one generation per year and overwinters as a pre-pupa in a cocoon in the soil. If you are interested in reading more about this critter just do a web search for this Auburn University publication, "Seasonal Cycle and Habits of the Butternut Woollyworm".



Top: Butternut woollyworm with "flocculence". Bottom: Butternut woollyworm with flocculence removed showing typical sawfly larval form. Photos by Mark Guthmiller

SOD Forest Health Assistance

Wisconsin DNR, Forest Health Protection Unit

December 2015

Contacts for DNR staff, municipal foresters, and forestry cooperators

<p>Mark Guthmiller Forest Health Specialist Wisconsin DNR 3911 Fish Hatchery Road Fitchburg, WI 53711 Phone: (608) 275-3223 Email: Mark.Guthmiller@wisconsin.gov Columbia, Dane, Dodge, Grant, Green, Iowa, Jefferson, Lafayette, Richland, Rock, and Sauk</p>	<p>Bill McNee Forest Health Specialist Wisconsin DNR 1155 Pilgrim Rd. Plymouth, WI 53073 Phone: 920-893-8543 Email: Bill.McNee@wisconsin.gov Kenosha, Milwaukee, Ozaukee, Racine, Sheboygan, Walworth, Washington, and Waukesha</p>
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For a statewide forest health staff list:

<http://dnr.wi.gov/topic/ForestHealth/staff.html>

Additional Program Web-based Resources:

WI DNR Forest Health web site:

<http://dnr.wi.gov/topic/ForestHealth/>

Report Emerald Ash Borer in Unconfirmed Counties:

by phone 1-800-462-2803

by email: DATCPEmeraldAshBorer@wisconsin.gov

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

Report Gypsy Moth:

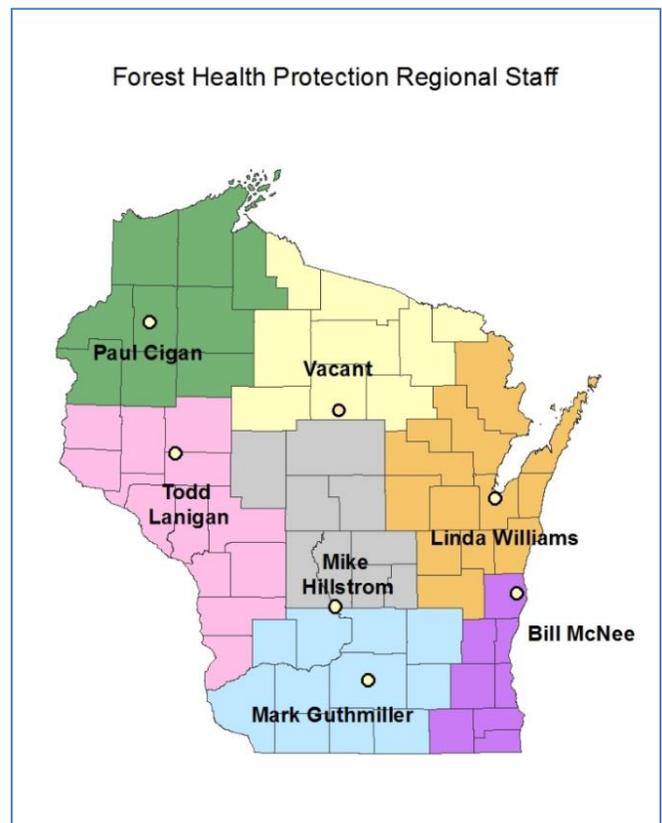
by phone at 1-800-642-6684

by email: dnfrgypsymoth@wisconsin.gov

visit the website: <http://gypsymoth.wi.gov>

(It is also recommended to report gypsy moth to your local government)

Please direct public inquiries regarding yard tree concerns to UW county or state extension offices: <http://www.uwex.edu/ces/cty/>



[Pesticide use: Pesticide recommendations contained in this newsletter are provided only as a guide. You, the applicator, are responsible for using pesticides according to the manufacturer's current label directions. Read and follow label directions and be aware of any state or local laws regarding pesticide use.]