Central States

Forest Health Watch

Current forest health information for land managers in Illinois, Indiana, Iowa and Missouri

November 29, 2004

About This Newsletter…

This collaborative effort of the USDA Forest Service Northeastern Area, Missouri Department of Conservation, and Indiana, Iowa and Illinois Departments of Natural Resources will provide updates three times per year (Spring, Summer, Autumn) on forest health issues of regional interest.

Important Regional Forest Health Issues

Our most significant regional forest health issues continue to be exotic forest pests. In this edition, you will find updates on emerald ash borer, sudden oak death, and gypsy moth.

Emerald Ash Borer (EAB)

Emerald ash borer continues to be a major concern in the upper Midwest. The core population is located in southeast Michigan where this small Asian beetle has already killed millions of ash trees. City's such as Ann Arbor and Detroit, Michigan have already lost most of their ash trees along city streets. Emerald ash borer is proving to be one of the most devastating tree killing insects ever introduced into the North American continent. Native ash in the genus *Fraxinus* appear to have no natural defenses against invasion by this beetle. The larval stages feed under the bark damaging the phloem region within a tree, tree death often occurs 1-3 years after the initial attacks. Emerald ash borer has been and can be moved around readily in infested firewood, logs and in infested nursery stock. Already, numerous outlier populations have been found scattered across the Lower Peninsula of Michigan. **These outliers have been traced back to either infested nursery stock or infested firewood.** Populations of emerald ash borer are also scattered across northwest Ohio.

In Indiana, three infestations have been identified to date, all of which are scheduled for ash tree removal to eradicate EAB. One is in **Steuben County, in the Jellystone Campground**. Approximately 1,000 ash trees will be removed in a 1+ square mile around the Campground. The area of this infestation has remained stable, with the quarantine area including only Jamestown Township. In November, a **new site was confirmed in Steuben County, in Manapogo Campground,** which is approximately 1 mile from the Jellystone Campground. The quarantine area associated with this new site is Millgrove Township. Delimiting surveys in preparation for eradication will begin in early December. The **third infestation is near Shipshewana in Lagrange County**, and surveys have resulted in increase in its size to include approximately 6 to 7 sq miles of area. Over 23,000 ash trees will be removed from this area. The quarantine area associated with this site is Clay Township and Van Buren Township. As an indication of the human resources EAB is consuming in Indiana, consider that it took 40 foresters and other resource professionals within the DNR the equivalent of one man year of time (accomplished over a 6 week period) to mark the ash at Shipshewana and Jellystone for eradication. Several web sites are available for updates on EAB:

For emerald ash borer status in Indiana http://www.entm.purdue.edu/EAB/
For emerald ash borer status in Ohio http://ashalert.osu.edu/
For emerald ash borer status in Michigan http://www.emeraldashborer.info/index.cfm

Surveys were done in many states this past summer. No emerald ash borer was reported outside of Michigan, Indiana or Ohio. However, surveying is difficult for this beetle since an efficient trap has not yet been devised. Girdled ash trees do attract beetles but these trees must have their bark peeled off to check for larvae at the end of the growing season. Visual signs of an infestation such as tree decline and beetle exit holes do not become readily apparent until the beetle has been present in an area for a few years.

State-Specific Updates on 2004 EAB surveys:	
Iowa	Several thousand ash trees were surveyed for EAB. Iowa State University looked at trees from an earlier study of ash, plus random sites, industrial sites recently landscaped, and various other sites in virtually every county in Iowa. A DNR person checked 32 cities having forest product mills (veneer, saw, pallet, pallet recycling, furniture, etc.), plus two trap trees. Everything was negative, although several instances of native borers were detected.
Indiana	Street surveys conducted in cities and towns in northern Indiana, and all trap trees set in Dekalb County and surrounding areas are negative to date. Not all trap trees have been examined as yet.
Illinois	Visual tree and firewood surveys were conducted throughout the state, including stands of ash previously identified as under stress from ash yellows disease and state or private forests with accompanying campgrounds. Emerald ash borer was not detected at any survey site during 2004.

Sudden Oak Death

Nursery environs and general forest surveys were conducted by the Forest Service and State cooperators throughout the country in 2004. For our 4-state area, all 442 samples from 69 sites were negative for SOD. A similar survey is planned for all our states in 2005.

Regional survey results are summarized in the following table; all PCR tests have been negative for the SOD organism:

State	Number of Nursery plots	Samples collected and tested	Number of Forest plots	Samples Collected and tested
IA	0	0	12	105
IL	5	28	7	46
IN	9	87	6	59
MO	8	34	22	83

Nationally, at this time, 647 nursery sites and 215 general forest sites have been visited, and 4,144 samples collected. We are well on our way to completing PCR testing on all these samples. There were two positive samples collected in Golden Gate Park (San Francisco, CA) in the heart of the infestation, not surprising.

APHIS is responsible for conducting national nursery and retail outlet surveys, trace forwards and trace backs. They have visited almost 3,100 sites and collected over 50,000 samples, 15 have tested positive, none in our region. The one sample that has created a controversy is the reported positive in a forest setting on Long Island, NY. Subsequent investigation has resulted in 244 negative PCR test results from the site in addition to dozens of negative cultures, soil and water baiting. Negotiations are underway to remove this one site as a positive.

If an infected plant is found in someone's yard the plant and associated debris within 2 meters will be removed from the site and soil treated with fungicide. Surveys will be conducted over a 100 meter radius and the sited monitored.

Gypsy Moth Activities

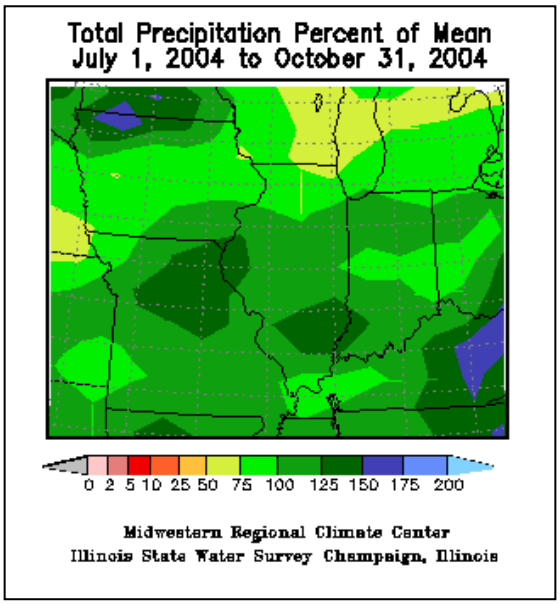
The table below summarizes the summer 2004 activities in the Central States.

States without established populations:			
	# traps set	Total moths captured	Comments
Iowa	4,374 + volunteers	27 (compared to 159 in 2003)	Trapping by several agencies (APHIS, DNR, Dept of Ag, County, City, and COE) concentrated on cities, nurseries, campgrounds/recreation areas, sawmills, and previous catch sites. The 2004 catch was much lower, with only 27 single moths, 18 of which were in Allamakee County (extreme NE IA). In Spring 2004, APHIS treated two sites and no moths were caught at either after treatment. DNR also coordinates an extensive system of volunteer trappers; none caught a moth this year.
Missouri	11,850	18	Moths were taken in 16 traps from 7 counties. Continuing the pattern of the past several years, most moths were captured in the St. Louis area (9 moths), followed by locations near Branson and other recreational areas in southwest Missouri (6 moths). Additionally, two moths were caught in Kansas City and one in Columbia.

In states with established populations, the state is generally divided into 3 zones. The "quarantine area" is the portion where gypsy moth is considered established. The "STS Action zone" is the portion of the state where treatment activities are undertaken to limit moth population, and thus "slow the spread" of gypsy moth. The remainder of the state is considered uninfested, and actions may be taken to eradicate any infestations that are found in those areas.

States with established populations:					
	Quarantine Area	Slow-The-Spread (STS) Actions	Counties with STS treatments	STS trapping results	Trapping trends outside quarantine and STS area
Illinois	One county (Lake) is generally infested and is under APHIS quarantine.	18500 acres treated with mating disruption 6616 acres treated with Btk	Cook, DuPage, McHenry, Kane, Carroll, and Will	37214 moths captured in the 6632 traps set in the 21 county STS trapping area	6,786 traps were set by APHIS in 86 counties in central and southern IL. Eleven gypsy moths were caught. Nine counties had positive catches. No moths were caught on the Shawnee National Forest.
Indiana	Allen, DeKalb, Noble, Elkhart, La Grange, Porter and Steuben counties are under APHIS quarantine. Moth populations were down in 2004, and no defoliation was observed.	38,640 acres on 16 sites with mating disruption; 3,969 acres on 22 sites with Btk.	LaPorte, Kosciusko, Whitley, Allen, Lake, Porter, St. Joseph, Marshall, Noble Elkhart, DeKalb, and La Grange.	5,108 moths were captured in the 9132 traps set in the STS area.	7852 traps set by APHIS & IDNR in the remainder of the state below the STS zone captured 19 moths; 13 were single catches, two traps in separate locations had 3 moths each.

Weather Overview



Summer and autumn of 2004 generally provided adequate moisture throughout the Central States, as you can see on the precipitation map to the right. This moisture had somewhat varying effects across the region, however.

Rainfall patterns were very favorable and consistent over much of **Iowa** during the 2004 growing season and forests appeared lush and healthy in general as a result. Storm damage appeared minimal during 2004.

Missouri experienced a spring with above average rainfall, and then saw the 7th coolest summer (June to August) on record. Precipitation was above average in much of the state during July and August, but later dropped to below normal giving the 6th driest September on record. The cool, wet summer resulted in some health concerns for Missouri trees, including prolonged opportunity for foliar diseases and excessive moisture/lack of aeration in some soils.

After a very wet spring and early summer, a minor drought period occurred across **Indiana** from mid August to early October. This was a welcome event for the foresters who marked the ash trees in LaGrange and Steuben County, as it dried the woods making it easier to work and kept the mosquito population down. Recent rains in late October and November appear to have replenished the soils and no serious damage is expected now or during 2005.

What Else Is Being Reported Across the Region…

The annual aerial survey flights in Iowa demonstrated an increase in **Dutch elm disease**, **oak decline** and **oak wilt**. Phyllosticta leafspot was very common on aspen this year. The Iowa DNR and USDA Forest Service have continued to collaborate on a case study to determine and document the cause of **white oak decline** on 3 sites in eastern Iowa. We are assessing temperature patterns, tatters development, starch content in roots, growth rates, and presence of oak wilt disease and *Ganoderma* sp.

Potato leafhopper damage to red maple leaf. *Photo by Rob Lawrence*.

Leaf damage apparently caused by **potato leafhoppers** (*Empoasca fabae*) was observed on several hardwood species in southern Missouri during July and August. Affected species included red maple, oaks, redbud, and yellow poplar. Feeding on vascular tissue and injection of saliva by leafhoppers causes "hopperburn", in which leaves become leathery, curled, and have yellow stippling. Damage often resembles herbicide damage. Leaf margins may be light green, red or brown, or have triangular-shaped necrotic leaf tips.

Numerous reports this fall of people being bitten by unseen creatures in Kansas, Nebraska, and Missouri resulted in the discovery of the **itch mite**, *Pyemotes herfsi* (Oudemans), an **exotic species of predatory mite** previously unknown in North America. This mite preys on several moth species in its native range in central Europe. In the U.S., it has been associated recently with **oak gall midge larvae** (Cecidomyiidae). *P. herfsi* has also been the cause of **dermatitis in humans** in Europe, and now in the U.S. People who have been bitten develop welts on many parts of the body, including locations not normally associated with chiggers.

Many reports of mysterious bites occurred during late August and September 2004 at several locations in the three states. Bites were also reported in November in Missouri. Bites often appeared after victims engaged in various outdoor activities, especially raking pin oak leaves, but were also reported by people who had limited outdoor exposure.

University, state, and county officials in Kansas and Nebraska determined the primary causal agents to be *Pyemotes* sp. mites inhabiting oak leaf galls. They were initially suspected of being the straw itch mite, *P. tritici*, a species known for causing human dermatitis in the U.S., but were later confirmed as *P. herfsi.* These mites were associated with the presence of unusually high numbers of the marginal fold gall. Other mite species were also reported as being found in these galls.

In November, Dr. Benjamin Puttler and Dr. Richard Houseman, University of Missouri Dept. of Entomology, observed *Pyemotes* sp. mites feeding on midge larvae and reproducing within another type of gall, the vein pocket gall on pin oak.

For further information see these web sites:
http://www.oznet.ksu.edu/news/sty/2004/itch_mite102204.htm
http://lancaster.unl.edu/nebline/2004/novdec04/page07.pdf
http://faculty.pittstate.edu/~dgordon/MysteryBites/MysteryBitesTest.html

Most of the **looper defoliation** in Indiana in 2004 shifted to the north. Brown County State Park, Yellowwood State Forest, and areas east of the Deam Wilderness on the Hoosier National Forest experienced heavy to severe defoliation. Areas defoliated in 2003 in the southern part of south central Indiana experienced light defoliation or none all. Looper traps were set throughout south central Indiana in late October and early November to monitor Linden Looper. The traps will be checked and replaced in February to get the count of Linden Looper and prepare for the emergence of Half Wing Geometer. Based on the change in defoliation between 2003 and 2004, the population has collapsed in southern areas and thus could collapse in 2005 in the northern areas of south central Indiana.

Foresters have reported a limited number of **white oaks** in **Indiana** forests have been killed by the **Two-lined Chestnut Borer (TLCB)**. Usually TLCB is observed following drought or defoliation stress in

conjunction with Armillaria root rot. Because white oak does not readily die, having trees killed by TLCB raises concern that something else may be wrong with white oak.

Periodical Cicada in Indiana has been forgotten after all of the attention that it received in the spring, primarily because of EAB taking the main focus of our time and energy. Trees in some areas across the state were heavily 'flagged' by the cicada, however damage was not as heavy as first expected. More concern was expressed on the noise than on the amount of damage to trees.

Feature Topic: Winter Weather and Woody Plant Problems

Modified from the April 9, 2004, feature article by Karel Jacobs and Cindy Terrell in The Morton Arboretum Plant Health Care Report.
Additional suggestions were borrowed from the November 2004 article, "Do's and Don'ts of Fall Maintenance for Woody Ornamentals", by Chris Starbuck in Missouri Environment & Garden, News for Missouri's Gardens, Yards and Resources.

Winter weather causes injury to trees and shrubs that, while not usually lethal, can lead to prolonged stress and reduced growth and vitality. **How does winter weather relate to pests and diseases?** Winter-damaged trees are stressed and therefore less resilient to disease and insect attack, and dead tissue that results from winter injury provides entry points for many secondary pathogens. Snow cover enhances survival and growth of many insects and pathogens because it protects their dormant, or quasi-dormant, overwintering structures in soil and debris. Gypsy moth and Japanese beetle winter survival is documented to increase with snow cover and milder temperatures during the winter months. See more on insect survival during winter from a previous PHC report by Dr. Fred Miller (http://www.mortonarboretumphc.org/feature%20articles/Insects/Overwintering%20Strategies%20of%20Insects%20and%20Implications%20for%20IPM%20%20August%202003.pdf)

Some plant pathogens remain active in plant tissue all winter. For example, fungi that cause certain canker and anthracnose diseases continue growing in bark and wood provided the winter temperature drop is not too severe or prolonged. The target appearance of cankers is the result of winter growth by the pathogen and delimitation of infected tissue by the host once its growth resumes in the spring.

Below is a list of different types of winter injury you may encounter:

- **Excessive drying/winter drought** causes browning of foliage of evergreens, e.g. white pine, due to water deficit in the plant when the amount of water lost by foliage exceeds what is taken up by the roots. Warm, sunny, winter days and dry or frozen soil worsen the deficit. People don't often think of winter drought as the cause of this problem because needles remain green until the warm temperatures arrive in spring.
- **Low temperature injury** appears as a fairly uniform distribution of twig and branch dieback. This occurs when winter or late spring temperatures are much below normal or when temperatures fluctuate widely and break plant dormancy. The line of demarcation between dead and living tissue is uniform and relatively easy to see.
- **Frost injury** kills succulent stem tissue, leaves, and buds if a late spring frost occurs. In northern Illinois, the average last frost date is May 2nd, but the latest frost on record is June 12th.
- **Winter sunscald** occurs during late winter/early spring when temperatures are above freezing during the day and below freezing at night. Cambial tissues become active when warmed by the sun only to freeze at night. The result is a superficial, elongated canker usually on the southwest side of a tree. Species with thin, smooth, or even dark colored bark are most susceptible to sunscald, e.g. maple.
- **Frost cracking** occurs mainly on hardwoods species, such as ash, when temperatures drop rapidly in a short period of time. Similar to sunscald, the warmed bark on the sunny (southwest) side of the tree may crack vertically. The cracks often originate from a prior wound or branch stub.

- **Salt spray injury** resembles that of desiccation or drought stress except appearing in a pattern associated with a "spray zone" (one-sided and more pronounced closer to the source of salt). Symptoms of foliar browning, marginal scorching, leaf/needle drop, bud and flower death, and twig and branch dieback occur on the side of the tree facing the road or sidewalk.

How to manage winter injury? We can't control the weather, but we can intervene to prevent permanent winter damage and lessen the likelihood of attack by secondary diseases and insects. Here are a few suggestions:

- Plant species adapted to local conditions and use protected sites for plants at their hardiness limit.
- Do not use high nitrogen fertilizer late in the growing season—it may extend succulent growth at the expense of dormancy.
- Avoid planting in low-lying areas that are most subject to frost.
- Shade, or use tree wrap, on young and thin-barked trees to reduce scald and frost cracks. Do not, however, wrap a trunk with a dark-colored material such as weed barrier fabric. This increases the temperature of the underlying bark and provides no significant insulation to prevent bark freezing.
- Avoid excessive pruning in late summer and fall, as it may stimulate growth and delay the development of dormancy. It is common to see dieback of stem tissues directly below pruning cuts or of new growth that comes in response to late summer or early fall pruning.
- Irrigate or water in the fall to recharge the soil moisture around newly planted trees and shrubs, especially evergreens, so they do not desiccate during exposure to cold, dry winter winds.
- Apply a layer of mulch after the soil surface begins to freeze (wait until then to help plants develop dormancy sooner). Mulching can keep surface roots above freezing and prevent "heaving" of roots out of the soil with repeated freezing and thawing. Do not apply a mulch layer thicker than about 3 inches, since this may cause the soil to hold too much water during wet periods in winter and spring, leading to root and crown rot.
- If dieback does occur, wait until the threat of spring frost is over, and then prune winter-damaged branches. Also, branches that have had cambial damage may not die until after growth resumes; prune these as they die.
- Consider fertilizing damaged trees and shrubs in early spring with a complete fertilizer (e.g. 10-6-4). Water damaged trees thoroughly during dry periods during the summer.

Current and past editions of The Morton Arboretum PHC Monitoring Report and feature articles are available on the "Plant Health Care" website at http://www.mortonarboretumphc.org/index.html

Current and past editions of Missouri Environment & Garden are available on the www at http://agebb.missouri.edu/hort/meg/archives/index.htm Missouri Environment and Garden is a joint effort of the University of Missouri, Columbia, and the Missouri Botanical Garden.

Upcoming Opportunities, Other Resources and Sources of Information

Sudden Oak Death Science Symposium II, January 18-21, 2005 at the Marriott Hotel in Monterey, CA. The goal is to provide a scientific overview on the state of our knowledge about Sudden Oak Death in forest, woodland, urban forestry, nurseries and agricultural settings. The symposium will provide not only completed research studies, but updates on current projects underway. See the symposium website for more info: http://nature.berkeley.edu/forestry/sodsymposium/

USDA Interagency Research Forum on Gypsy Moth and Other Invasive Species, January 18-21, 2005 in Annapolis, Maryland. For more information on this annual forum, visit the website at: http://www.fs.fed.us/ne/morgantown/4557/forum/index.shtml

The national Forest Health Monitoring Working Group meeting will be held in Miami, Florida, January 24-27, 2005. The workshop theme is invasive species. Workshop objectives are to report on forest health conditions and trends, present recent advances in forest health monitoring, evaluations and research, and develop recommendations for improving the FHM program. Agenda, registration and local arrangements information are available on the FHM website at http://www.na.fs.fed.us/spfo/fhm/index.htm

The Iowa Forest Insect and Disease Management Council meeting will hold their winter meeting on December 8th at the State Forest Nursery in Ames, Iowa. Contact Steve Pennington at (515)233-1161 for more information.

Forest Health Highlights (with yearly forest health report for each state, usually updated in January): http://www.na.fs.fed.us/spfo/fhm/fhh/fhmusamap.htm

This newsletter is also available on the WWW at:
http://www.na.fs.fed.us/spfo/pubs/newsletters/csfhw

Northeastern Area

Indiana

For More Information:

Forest Health Protection
USDA Forest Service
1992 Folwell Avenue
St. Paul, MN 55108
(651) 649-5029
lhaugen@fs.fed.us