



Central States Forest Health Watch



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

November 5, 2003

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.

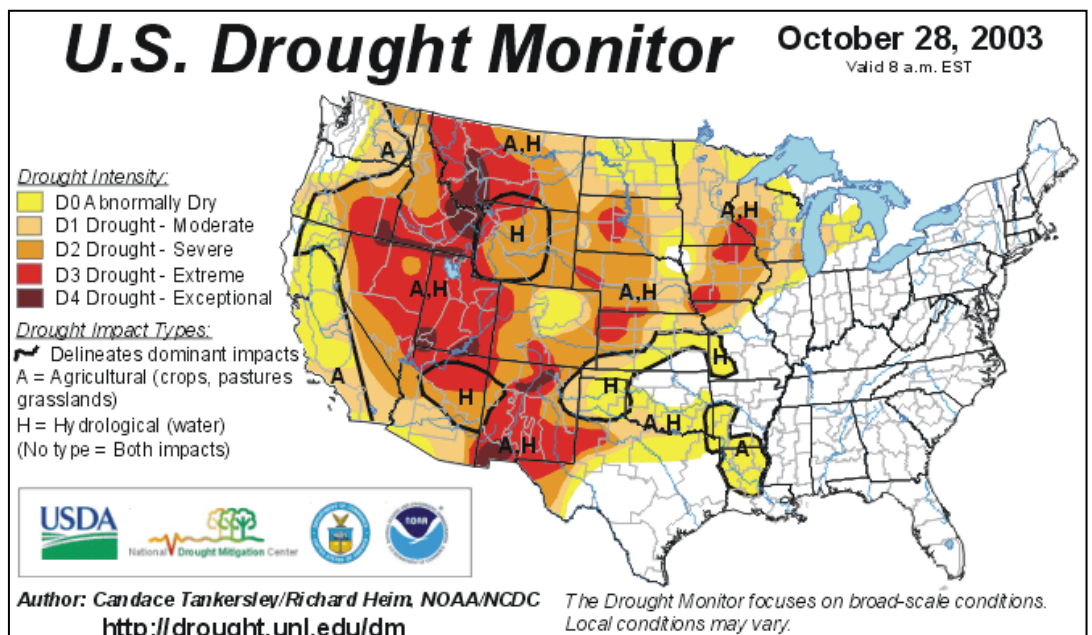
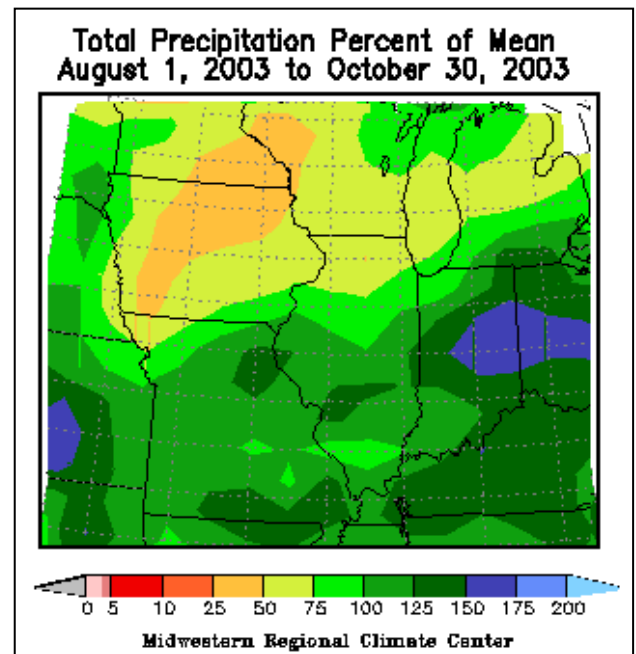
This edition has gotten a bit long as we have tried to capture important information in enough detail to be useful to you. However, as field season winds down, perhaps you can find a cold, drizzly day to sit down with a hot cuppa to read this through! Enjoy!

Important Regional Forest Health Issues

Weather—Feast or famine, deluge or drought.

Late summer 2003 was marked by extreme weather patterns across the Central States: extreme moisture in some areas, excessive drought in others. Generally, the northwestern portions of the region (northwest Missouri, all of Iowa, northern Illinois) are very dry, while southeastern portion of the region (all of Indiana and southern Illinois) have suffered repeated waves of severe weather and heavy rain. In July, precipitation totals were greater than 10-12" across much of Indiana, resulting in the second wettest July on record. The deluge continued in late August and early September, as tropical moist air drenched a swath across Indiana, central Illinois, and northeastern Missouri with 5 to 10" of rain. Indiana and

Illinois had their second wettest September in 108 years, and Indiana set an all-time high rainfall record for the July to September period. Meanwhile, western Missouri received less than 50% of normal precipitation in July; Iowa, Missouri and northern Illinois received less than 1.5 inches of rain during the first 4 weeks of August;



and northwest Missouri, northwest Illinois, and Iowa were missed by the early September deluge. West central Missouri has received some needed precipitation, but northwestern Missouri continues in the second year of severe to extreme drought conditions. The effects of these weather patterns are reflected on the maps— Iowa, northwest Missouri, and northern Illinois are abnormally dry to extreme drought. Indiana, on the other hand, has a big spot of 175% of normal rainfall for August through October.

According to Pat Guinan, University of Missouri Climatologist, even if precipitation in northwest Missouri this fall is near normal, it is highly unlikely winter precipitation will be enough to replenish water supplies, and the result will be continuation of drought conditions next spring. Current predictions by the NOAA Climate Prediction Center for November 2003 through January 2004 indicate near normal precipitation for northern Missouri and above normal for the southern half of the state. So, how can we expect this to affect our trees? In the drought stricken areas, we can expect to see increased attacks by bark beetles and wood borers on both hardwood and conifer tree species. Trees growing on thin, rocky soils or in stressful urban settings are particularly at risk. Many attacks by Ips beetles and various wood borers are already being reported in the Kansas City area on conifers not native to Missouri such as Scots, Austrian, white, red, and jack pines. High numbers of twig girdler attacks have been seen on oaks and other hardwoods throughout western Missouri.

In the areas that have suffered excessive moisture, high rainfall and humidity generally lead to increased leaf disease problems. The effects of flooding itself are more variable, depending on the duration of the inundation and other factors. In the aftermath of the major floods of 1993, several articles were written which provide insight on how trees can be expected to respond. These include:

The USDA Forest Service prepared an information packet on “ Flooding and It’s Effect on Trees ”, which includes factors involved in flood impact and comparative lists of flood tolerance of different tree species. This pub is available at: http://www.na.fs.fed.us/spfo/pubs/n_resource/flood/toler.htm
The University of Illinois prepared a document entitled Flooding Effects on Urban and Community Trees (INHS Reports July-August 1995) that captures some information on the impact of the 1993 floods on different tree species. http://www.inhs.uiuc.edu/chf/pub/surveyreports/jul-aug95/trees.html
Iowa State University Extension produced a 4-page document in 1994 entitled “ Understanding the Effects of Flooding on Trees ”: http://www.extension.iastate.edu/Publications/SUL1.pdf
The Missouri Conservationist printed a discussion of flood impacts in 1995, entitled “ Floods and Trees ”, which presents some of the factors and responses in Missouri forests. http://www.conservation.state.mo.us/conmag/1995/aug/aug5.html
The results of a couple of ongoing studies following the 1993 floods can be found in the USGS project reports “ Forest Response to High Duration and Intensity Flooding along Pool 26 of the Upper Mississippi River” http://www.umesc.usgs.gov/reports_publications/psrs/psr_1999_01.html and “ Predicting Flood Potential to Assist Reforestation for the Upper Mississippi River System” at http://www.umesc.usgs.gov/reports_publications/psrs/psr_2001_01.html
And, last-but-not-least, TreeLink provides links to several on-line publications related to flood damage to trees at http://www.treelink.org/linx/index.phtml?navTypeRef=5&navSubCatRef=13

Emerald Ash Borer (EAB)

This insect is a newly reported beetle (summer 2002) from Asia found attacking ash (genus *Fraxinus*) trees in southern Michigan an adjacent area of Windsor, Canada and locations in northwest Ohio (Lucas and DeFiance Counties). The Maryland Dept. of Agriculture reported emerald ash borer infested trees at a nursery in September 2003. The actual path of nursery material is difficult to verify, but it has been reported that the Maryland nursery material originated in Michigan prior to the implementation of quarantine measures. Two high-risk pathways for movement of the EAB to new areas are infested landscape planting material and firewood. The Michigan Department of Agriculture and the USDA have placed a [quarantine](#) on 13 counties in Southeast, MI to reduce the likelihood of transporting the beetle outside the currently infested area. Our feature article in this edition of the CSFW provides information on how to distinguish EAB from other maladies of ash.

Gypsy Moth Activities

The table below summarizes the summer 2003 activities in the Central States.

States without established populations:					
	# traps set	Total moths captured	Comments		
Iowa	3561 + 250 by volunteers (3811 total)	159	Trapping concentrated on cities, nurseries, campgrounds/recreation areas, sawmills, and previous catch sites. The catch is up significantly from last year. A nursery near Sioux City was sprayed twice in 2003, and a nursery site in the Quad Cities probably will need treatment in spring 2004. A policy paper to guide budgeting, interagency cooperation, and STS for gypsy moth in Iowa is being revised.		
Missouri	11,600	11	Moths were captured in the St. Louis and Branson areas (5 moths and 1 moth, respectively) as has been typical for the past several years. However this is the first year since 1999 that moths were also captured in other widely scattered locations including Kansas City, Columbia, and other central and southwestern MO locations.		
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 considered generally infested and is under APHIS quarantine.	30,084 acres with mating disruption, 3,959 acres with Btk.	Cook, DuPage, Winnebago, McHenry, Kane, Boone, Carroll and Will	38,569 moths were captured in 6,205 traps set in STS area.	6564 traps set in 86 Central and Southern IL counties. Total of 149 moths caught in 32 counties; 7 were doubles, 2 were triples. This is a significant increase over 2002 catches.
Indiana	Allen, DeKalb, Noble, Elkhart, La Grange, Porter and Steuben counties are under APHIS quarantine.	16,901 acres with mating disruption, 690 acres with Btk.	LaPorte, Kosciusko, Whitley, Allen, Lake, Porter, St. Joseph, Marshall and Noble	23,032 moths were captured in 8,431 traps set in STS area.	7,907 traps were set by Aphis & IDNR in the remainder of the state below the STS zone. 58 moths captured.

Other Emerging Threats

The **Banded Elm Bark Beetle** (*Scolytus schevyrewi*) was detected in Colorado and Utah in May 2003. It is native to China, Russia, Mongolia, and Korea. Hosts in its native range include elms, willows, Russian olive, and *Prunus* species, but currently it has only been found in elms in the US. More recent detections include Kansas, New Mexico, Nebraska, and Nevada. Thus it appears to be widely established in the West. No surveys were done in the Midwest States during 2003, but they will be considered for 2004. For more information on this new exotic beetle, see the following websites:

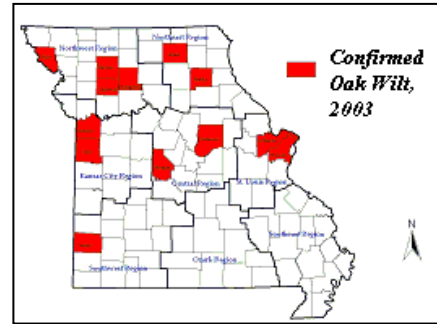
<http://www.ceris.purdue.edu/napis/pests/barkb/index.html>

<http://www.spfnc.fs.fed.us/exfor/data/pestreports.cfm?pestidval=52&langdisplay=english>

All surveys to date throughout the Eastern US have been negative for **Sudden Oak Death (SOD)**, caused by *Phytophthora ramorum*. Information on the national survey for SOD in forests can be found on the Forest Health Monitoring website at: http://www.na.fs.fed.us/spfo/fhm/sod/sod_natnl.pdf. We need to continue to be vigilant to prevent the introduction of SOD into the East, and for early detection if it were to be introduced. The North Central Research Station (Dr. Jennifer Juzwik) is initiating a study in eastern oak forests to determine baseline information on what phytophthoras are currently present. Samples from oak forests in Indiana, Illinois, Maryland, Pennsylvania, and West Virginia will be included in this study. For more information on SOD, see the pest alert at http://www.na.fs.fed.us/spfo/pubs/pest_al/sodeast/sodeast.htm or the California Oak Mortality Website at <http://www.suddenoakdeath.org/>.

What Else Is Being Reported Across the Region...

Oak wilt remains the number one disease problem in Missouri. It was positively identified in 13 counties in 2003. The Missouri Department of Conservation's diagnostic lab recorded its first positive identification on white oak from the Northwest region and handled hundreds of suspected oak wilt inquiries from across the state. Other important tree issues for the year included: Dutch elm disease, Verticillium wilt on maple, and Sudden Needle Drop on spruce (SNEED). SNEED is a condition where 2nd year spruce needles on scattered branches in the crown turn chlorotic, purple brown, then drop off. This condition has been associated with a fungus, *Setomelanomma holmii*, which produces fruiting structures on the affected twigs. This fungus and condition have also been reported in Wisconsin and Minnesota. For more detailed information on this fungus, the condition, and suggested management options, go to this [LINK](#).



Ozone plant damage was surveyed in Missouri during late July and early August as part of the national Forest Health Monitoring program. Nine of 39 plot locations were suspected of having ozone damage.

Feature Topic: A Comparison of Ash Maladies

Decline or death of ash trees can be caused by many factors, so how can you tell whether it is Emerald Ash Borer (EAB) or something different? This article will help you sort out the difference, and point you to sources of additional information.

Something major or something minor?

Generally, something that affects the root system or main stem is more serious than something that affects only leaves, twigs, or individual branches. Of course, things that repeatedly destroy large amounts of leaf tissue can cause branch dieback and impact tree health, but they don't outright KILL the tree. Anthracnose and leaf-feeding insects affect individual leaves and branches in the crown, but typically do not cause death of the main stem or extensive crown dieback. If you're seeing extensive crown dieback or death of whole trees, epicormic sprouts or witches'-brooms on the main stem, or severe decline in tree health, you should look for a more serious problem.

Ash decline or a borer problem?

Change in health status of a tree over time can be a good indicator of the cause of the problem—but it is also very difficult to assess, especially if you only have the opportunity to observe a tree at one point in time. One good indicator of cumulative health is the amount of growth that a tree is putting on each year—both radial increment (e.g. growth rings), and internodal growth of twigs. A pattern of reduced size of growth rings or shortened length of shoot growth can indicate that a tree is suffering from a chronic problem with ash decline or ash yellows. Relatively sudden death of branches or whole trees without any previous decline in growth can indicate an acute onset of borers or other damage agents.

Ash decline can be caused by a myriad of factors, including environmental factors (such as planting problems, wounding, site, weather, and others), the ash yellows phytoplasma, and an unidentified new disease agent that has been implicated in decline of ash in Iowa. The suite of symptoms can sometimes distinguish the cause of decline:

- Symptoms that may indicate environmental factors include crown dieback, reduced growth, and sparse or chlorotic foliage, particularly when they can be correlated with specific events or conditions on the site.
- Symptoms of ash yellows include witches'-brooms on the main stem, crown dieback, loss of apical dominance (exhibited in twig branching), reduced growth, and sparse/chlorotic foliage. For more

ash yellows info on the www, see http://www.na.fs.fed.us/spfo/pubs/howtos/ht_ash/ht_ash.htm or <http://www.ag.uiuc.edu/cespubs/hyg/html/200314c.html>

- Symptoms of the potential new disease are very similar to ash yellows, except that terminal branches are frequently killed and witches'-brooms are not produced (see Understanding Ash Decline [in Iowa]: <http://www.ag.iastate.edu/departments/forestry/ext/pubs/F-373.pdf>).

Other disease agents that may also cause some of these symptoms or be involved in decline include root rots (such as *Ganoderma lucidum*), heart rots (such as *Perenniporia fraxinophila*), and Verticillium wilt.

Symptoms and signs of borer attacks include: Dead branches in the crown of the tree, presence of insect activity (e.g. emergence holes and insect tunnels or galleries under the bark), and sometimes epicormic branches along the live side of the margin between killed and healthy portions of the main stem or major branches. Epicormic branching in response to borers may superficially appear similar to witches'-brooms from ash yellows, but it differs since when it is caused by borers the tissue above the epicormics will be dead, killed by the borers. The different borers that attack ash vary in their aggressiveness, so you may see some attacking otherwise healthy trees, while others may attack primarily stressed trees. The key sign to look for is the presence of insect activity.

Emerald ash borer or other borers?

Of the several borers that attack ash trees, the EAB (*Agrilus planipennis*) is quite distinctive. The EAB is a flatheaded borer, and leaves D-shaped emergence holes that are about 5 mm across. The only other metallic green adult flatheaded borer that might commonly be found in hardwoods is the flatheaded apple borer. Although maple, apple and poplar are its primary hosts, but it does attack a wide range of hosts, so there is some chance it could be found on ash. Another flatheaded borer, *Agrilus subcinctus*, will attack ash trees, but this native insect is much smaller than EAB. All other borers (including clearwing moths, longhorned beetles, and bark beetles) that occur on ash produce a round-shaped exit hole.

A comparison of common borers that occur on ash is provided in the table below:



Adult EAB. *A. Storer, MTU*



D-shaped exit hole, *D. McCullough, MSU*



EAB larvae, various instars, *D. Cappaert*



EAB galleries, *A. Storer, MTU*

Species	Size and shape of emergence hole	Description of adult	Symptoms and other comments
Emerald Ash Borer <i>Agrilus planipennis</i>	D-shaped, 3 to 5 mm in diameter	Adults can be found May through July. Metallic emerald green beetle, slender-shaped and 7.5 to 13.5 mm long.	First evidence may be dead branches in the crown. The larvae are creamy white and leave a winding, frass-filled gallery under the bark.
Flatheaded apple borer, <i>Chrysobothris femorata</i>	D-shaped and similar in size to EAB	7 to 16 mm long, but body is broadly oval shaped and color is green or bronze metallic hue with dull spots.	Might be found in hardwood forests, but ash is not its normal primary host.
<i>Agrilus subcinctus</i> ,	D-shaped, 1-2 mm wide	3.5 to 4.5 mm long, blackish colored (not emerald green).	Is found only in small branches

Species (continued)	Size and shape of emergence hole	Description of adult	Symptoms and other comments
Banded Ash Clearwing, <i>Podosesia aureocincta</i>	Round, 10 mm in diameter	Adult are clearwing moths that have dark forewings and bright orange-yellow band on the front part of abdomen	Large strands of frass pushed out of entrance holes, damage begins in autumn
Ash/lilac borer <i>Podosesia syringae</i>	Round, often have protruding pupal skins nearby	Clearwing moths that mimic paper wasps in appearance and flight	Similar to banded ash clearwing, but damage appears in summer. Look for oozing sap and frass extruded in small clumps.
Banded ash borer, <i>Neoclytus caprea</i>	Round	Adult beetles are 4-18 mm long, black with yellowish bands	Larval galleries packed with frass
Redheaded ash borer, <i>Neoclytus acuminatus</i>	Round	Adult beetles are 4-18 mm long, reddish with yellow bands.	Early attacks detected as sap spots with fine boring dust; later, frass is discharged from entrance holes
Eastern ash bark beetle, <i>Hylesinus aculeatus</i> , Northern ash bark beetle, <i>H. criddlei</i> , and white-banded ash bark beetle, <i>H. fasciatus</i>	Round, approx. 1 mm diameter	Adult beetles are elongate and cylindrical, 2.0 to 3.4 mm long	Egg galleries run across the wood grain, and larval galleries radiate out from the egg gallery.

Websites with additional information and images to help with identifying ash borers and other causes of damage include:

Emerald Ash Borer image collection: <http://www.na.fs.fed.us/spfo/eab/img/img.htm>

Ash pests: A Guide to Major Insects, Diseases, Air Pollution Injury, and Chemical Injury
<http://www.forestpests.org/ash/ashpests.html>

Pest Alert: Emerald Ash Borer http://www.na.fs.fed.us/spfo/pubs/pest_al/eab/emeraldashborer.pdf

EAB Field Guide: <http://www.fs.fed.us/na/morgantown/fhp/eab/eabfg.pdf>

What should you do if you think you have EAB???

Any suspect insects or trees should be reported to your appropriate [State Department of Agriculture](#) or [U.S.D.A. APHIS](#) representative.

Other Resources and Sources of Information

The **new publication**, *Urban Tree Risk Management: A Community Guide to Program Design and Implementation*, is hot off the press. This is a fully illustrated, easy to read training guide written for community leaders, administrators, city foresters, parks and public work staff, and private tree care practitioners. It is designed to assist communities develop and implement tree risk management programs, and train field staff to detect, assess, and correct hazardous defects in urban trees. This new publication fills a critical information gap, and marks the first time community planning and program design information has been included in a tree risk management training guide.

The new guide is currently available:

Online: Can be viewed and printed from the web at: <http://www.na.fs.fed.us/spfo/pubs/uf/utrmm/>







In Print: Limited quantities are currently available. Hard copies of the guide will be primarily distributed to attendees of training workshops.

The new guide will soon be available:

On CD: CD's will provide an affordable format to distribute the guide to a larger audience. Contact Jill Pokorny if you would like to receive e-mail notification when the CD is available at jpokorny@fs.fed.us.

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

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

  Northeastern Area			 Forestry Indiana		<p>For More Information: Forest Health Protection USDA Forest Service 1992 Folwell Avenue St. Paul, MN 55108 (651) 649-5029 lhaugen@fs.fed.us</p>
--	---	--	---	---	---