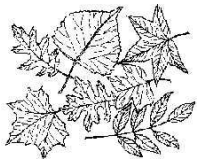
Central States Forest Health Watch



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

February 24, 2010

This collaborative effort of the USDA Forest Service Northeastern Area, Missouri Department of Conservation, and Indiana, Iowa and Illinois Departments of Natural Resources provides technical updates twice a year on forest health issues of regional interest. Useful information can also be found in previous editions, which are available on the www at http://na.fs.fed.us/fhp/fhw/csfhw/ .

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Important Regional Forest Health Issues

Nonnative insects and pathogens continue to be highly significant forest health issues in our region. In this edition you will find updates on emerald ash borer, gypsy moth, and sudden oak death.

Emerald Ash Borer (EAB)

The map on the following page shows the current EAB situation. The status in each state is briefly described below.

Indiana detected eight new counties with EAB infestations in 2009. Prior to 2008, the EAB detections were north of Indianapolis, but three counties were detected in 2008 and four counties in 2009 south of Indianapolis. All the infestations detected in southern Indiana started in 2004 or earlier. Thus, when EAB was first detected in Indiana (2004), infestations were already established throughout the state.

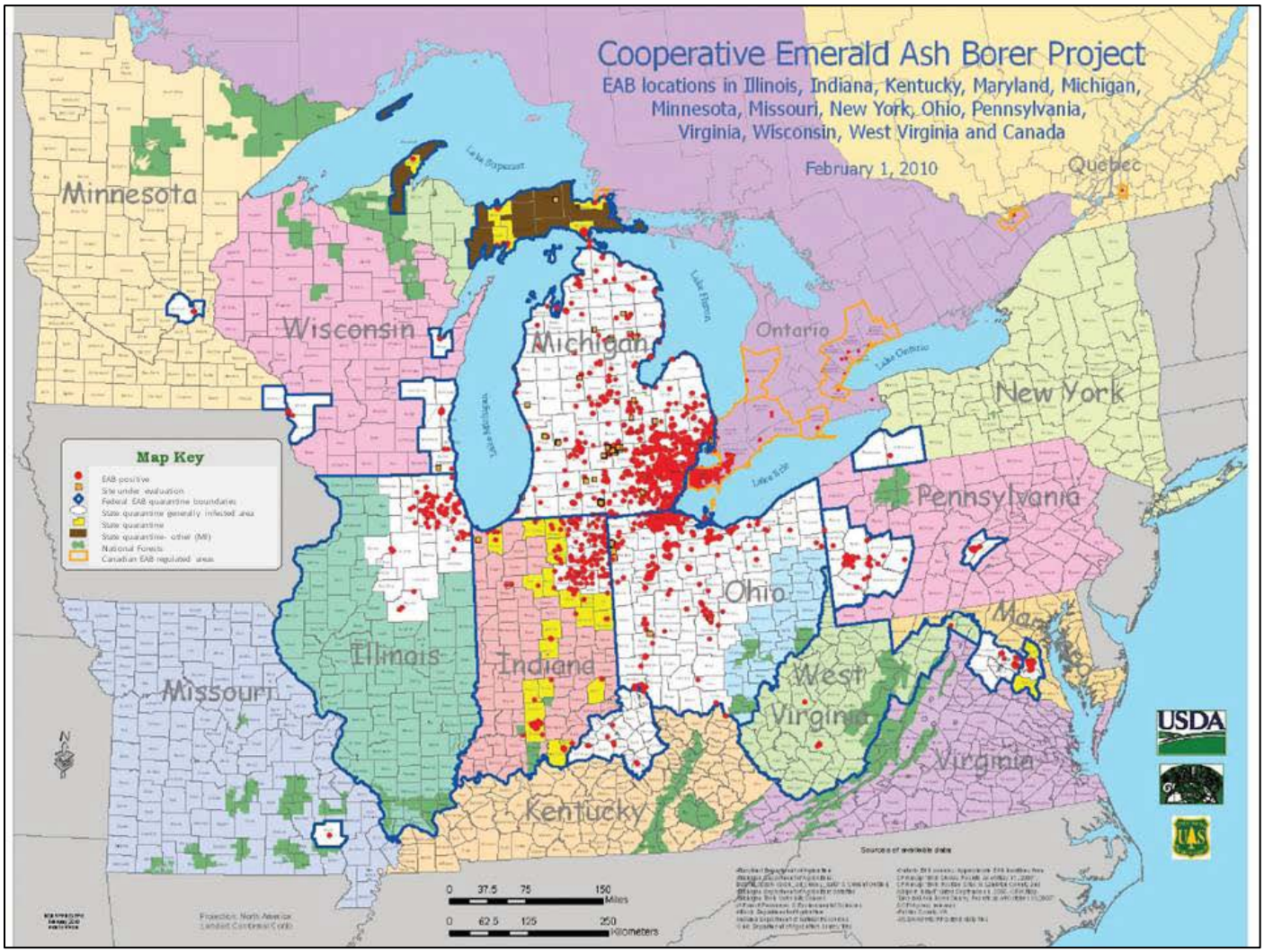
Illinois – Additional EAB finds were made in Illinois in 2009; none were outside the 21-county quarantine area in northeastern Illinois. Surveys are planned throughout much of the state for 2010. For more information (including known location maps and list) visit http://www.agr.state.il.us/eab/.

Missouri only has one known infestation at the Greenville site in Wayne County (detected in 2008). Detection surveys were negative in 2009. Delimit surveys of the Greenville site have not detected EAB outside the known core area. Trap trees from 2009 are still being evaluated. An intensive ash survey will be conducted around the Greenville infestation in 2010, and SLAM treatments are being proposed.

Iowa has no known EAB infestations. All detection surveys during 2009 were negative. The closest known infestation is just across the Mississippi River from Allamakee County, in Victory, WI (detected in 2009). The Iowa response has been to intensify survey efforts, especially in eastern Iowa. They are doing sentinel trees (400 per year), purple traps, and visual surveys of high risk areas. They have develop an EAB toolkit – available at www.iowadnr.gov/forestry/eab/index.html – and are doing workshops to train city and county employees, arborists, and forestry contractors to identify EAB symptoms, and prepare management plans. They are also collecting ash seeds as part of the Ash Genetic Conservation Plan by the National Seed Laboratory.

Minnesota's response to EAB is worth looking into. First, the city of St. Paul along with the Minnesota Department of Agriculture and their many cooperators have responded quickly and efficiently to the recent find of EAB in St. Paul. Prompt removal of infested trees, extensive surveys, a public information campaign, sound information on insecticide options, and the establishment of sink trees, have all contributed to an effort

to slow down the establishment phase of EAB in the Twin Cities area. Hopefully that will buy Minnesota communities and forest managers time to proactively respond to the impending loss of ash trees. That pro-active response has kicked into action in Minnesota with the assistance of some new state funding. Several communities received grants from the state to conduct surveys of their city trees, begin pre-emptive removals of ash, and pay for replanting and restoration of a more diverse urban forest. All of this will be done before EAB arrives in those locations. MN DNR foresters are moving forward on the development of management guidelines for stands containing ash and even more important they are setting targets to accomplish some active stand management that should reduce the impact of EAB, at least in some localized areas.



Opportunities to learn more about EAB:

The Symposium on Ash in North America, March 9-11, 2010, in West Lafayette, IN, is a conference designed to examine:

- ☐ The economic, environmental, and social/cultural importance of ash species in North America
- ☐ The current and potential effects on communities, industries, and the environment if the ash component of the landscape is reduced or eliminated
- ☐ The tools available to conserve and manage ash species or to fill the voids left by the elimination of ash

Registration after February 18 is $180. The meeting will be held in West Lafayette, IN, at the University Plaza Hotel. Registration and links to the conference agenda, lodging, and travel information are available through the conference web site at www.fnr.purdue.edu/ashsymposium. If you need additional information, please contact Lenny Farlee, (765) 494-2153, lfarlee@purdue.edu or Jodie Ellis, (765) 494-0822, ellisj@purdue.edu.

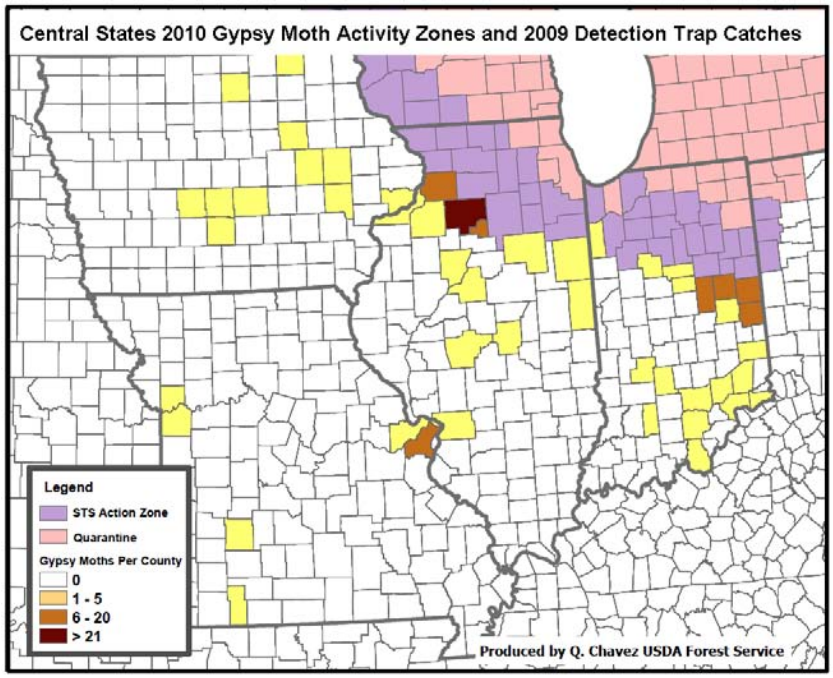
Emerald Ash Borer University is a webinar series designed to share information about EAB. The series is a collaborative effort of the USDA Forest Service, Michigan State University, Ohio State University, and Purdue University. All webinars are free, although registration is required for access. The topics covered are listed below. Get more information on this at:

http://www.emeraldashborer.info/eab_university.cfm

Topic	**Date**
Introduction to EAB	November 5, 2009 (Available Online)
EAB 101: The History of EAB and Basic Information	November 12, 2009 (Available Online)
Pesticides and Biocontrol to Manage EAB	December 3, 2009 (Available Online)
EAB Research Updates (Parts 1 and 2): The Latest Information From Researchers	Part 1, January 7, 2010 (Available Online) Part 2, January 14, 2010 (Available Online)
Utilization of Ash in the Wake of EAB	February 4, 2010 (Available Online)
Management of Woodlots to Prepare For EAB	February 11, 2010 (Available Online)
Regulatory Issues About EAB	March 4, 2010
Helping Communities Prepare for and Live With EAB	March 18, 2010
What Happens After Ash Is Gone? Planning Diversity	April 1, 2010
2010 EAB Awareness Week : Ways to Get The Word Out	April 8, 2010

Gypsy Moth (GM) Activities

The map and tables below summarize the summer 2009 activities in the Central States. Color coding in the tables matches up with the colors on the map that represent the various "zones" for gypsy moth management. In states with established populations, the state is generally divided into three zones. The "quarantine area" is the portion where gypsy moth is considered established, and suppression activities may take place (pink on map). 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 (lavender on map). The remainder of the state is considered uninfested, and actions may be taken to eradicate any infestations that are found in those areas.



The trapping in 2009 in the Central States was generally down compared to 2008. The cause is unknown. It was quite wet, which could favor biological control by *Entomophaga*, however we do not generally expect *Entomophaga* to start having an impact on gypsy moth populations until they are well established. Moth catches tended to be up in Minnesota. Additional information on the current status of gypsy moth and treatment areas can be obtained from the web page for the Decision Support System for the Gypsy Moth Slow-the-Spread Program at http://da.ento.vt.edu/

States without established populations:			
	# traps set	Total moths captured	Comments
Iowa	5217	82 (was 175 in 2007 and 626 in 2008)	Traps were placed by coordinated effort of State and Federal agencies and city and county foresters across Iowa. Most moths were caught in the STS action area in northeastern Iowa. No treatment activities are planned for 2010. To date, reproducing populations (e.g. egg masses and other life forms) have not been found. Delimit trapping will continue.
Missouri	9731	22 (was 7 in 2007 and 10 in 2008)	Traps were placed by coordinated effort of State and Federal agencies in 68 of 114 counties. Trapping density is based on risk of introduction, with the highest density of traps being set in the lakes regions and St. Louis, because of their elevated risk of introduction by out-of-state visitors. Seventeen positive traps were located in six counties (Clay, Jackson, Polk, Stone, St. Charles and St. Louis County). Most catches were one per trap, but multiples per trap were found in St. Louis and Clay Counties.

States with established populations:					
	Quarantine Area	Slow-The-Spread (STS) Actions	Counties with STS treatments	STS trapping results	Trends in the uninfested area (outside the quarantine and STS area)
Illinois	Four counties in northeastern Illinois (Lake, Cook, DuPage, and McHenry) are under quarantine. No new counties were added in 2009.	Mating disruption (SPLAT, an alternative to pheromone flakes) was applied to 10,701 acres in 2009. 948 acres were treated with two applications of Btk. Treatments were up from 2008 when 2,195 acres were treated with Btk and no mating disruption was applied. 7,300 acres were treated in 2007.	LaSalle, Lee, Ogle, and Stephenson	42,112 moths captured in the 6,366 traps set in the 25 county STS trapping area (northern Illinois). This is down from 133,050 in 2008.	5,584 traps were set by APHIS in 85 counties in central and southern Illinois. A total of 15 gypsy moths (down from 374 in 2008) were caught across 12 counties, mostly near the STS line. Moths were captured for the third year in a row in Madison County (southern Illinois), and this site will be delimit trapped (again) in 2010. Egg mass surveys will be conducted at this and other highest risk sites this winter. Limited defoliation occurred in the Chicago area. Some municipalities hired aerial applicators for treatments in the greater Chicago area.
Indiana	Steuben, LaGrange, Elkhart, Noble, DeKalb, Allen, Porter, and St. Joseph counties are under quarantine. St. Joseph was quarantined in 2009; It had been nine years since a county was added to the Indiana quarantine list.	Two blocks (3,520 acres) were treated with mating disruption in Kosciusko County; 10 sites (7,166 acres) were treated with one or two applications of Btk. Dimilin was used for ground treatment on one site in LaPorte County.	Allen , LaPorte, and Kosciusko.	In 2009, 5,734 moths were captured in the STS action zone, mostly in the eastern part of the zone. This was down from 9,321 moths in 2008.	Traps set by APHIS & IDNR in the remainder of the state below the STS zone captured 146 moths, compared to 82 moths in 2008 and 162 moths in 2007.

Sudden Oak Death (SOD): Findings from the 2009 National *P. ramorum* Early Detection Survey

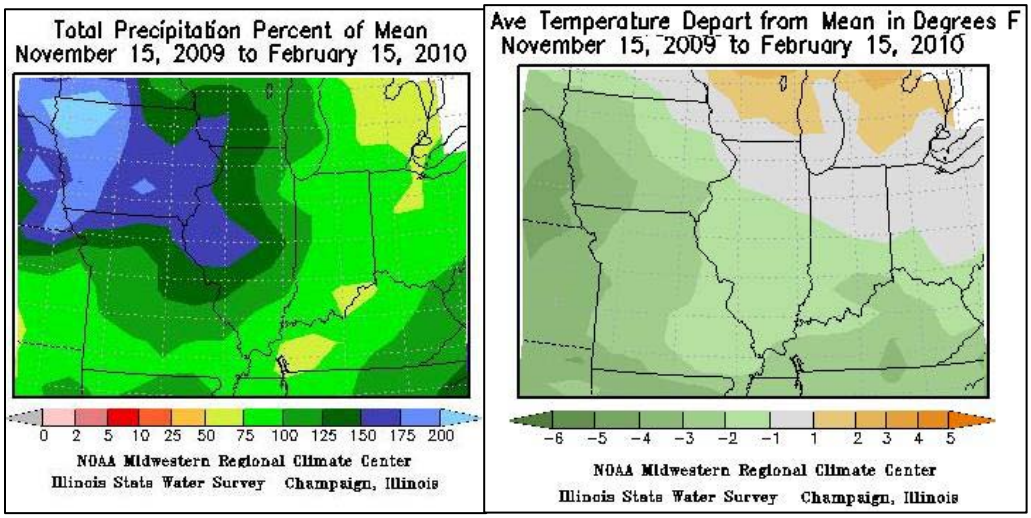
Surveys of streams in 2009 outside of nurseries and the regulated states resulted in more *P. ramorum* positives than in any previous year. In 2009, 116 streams were baited in 16 states. There were 5 new positive streams in 2009, for a total of 15 positive streams nationally, 9 of which are outside the regulated areas in California and Oregon. The five new positive streams were: three in Alabama, one in Oregon, and one in Georiga. The pathogen also has been detected in streamside plants in Mississippi, though no established infections have been found. As part of the survey, there were also an additional 50 baiting sites installed in the Sammamish River, WA (positive each year since 2007), in an attempt to delineate inoculum sources. No stream monitoring was done in the Central States.

Funding for the 2010 survey is expected to be at the 2009 level; therefore, similar level surveys with state cooperators are planned. The only significant program change is that the PCR diagnostics for the Eastern states will now be handled by the Pennsylvania Department of Agriculture, Plant Disease Diagnostic Laboratory in Harrisburg instead of Mississippi State University.

Additional information on SOD is available on the California Oak Mortality Task Force web page (http://www.suddenoakdeath.org/). New information is generally available in their current newsletter.

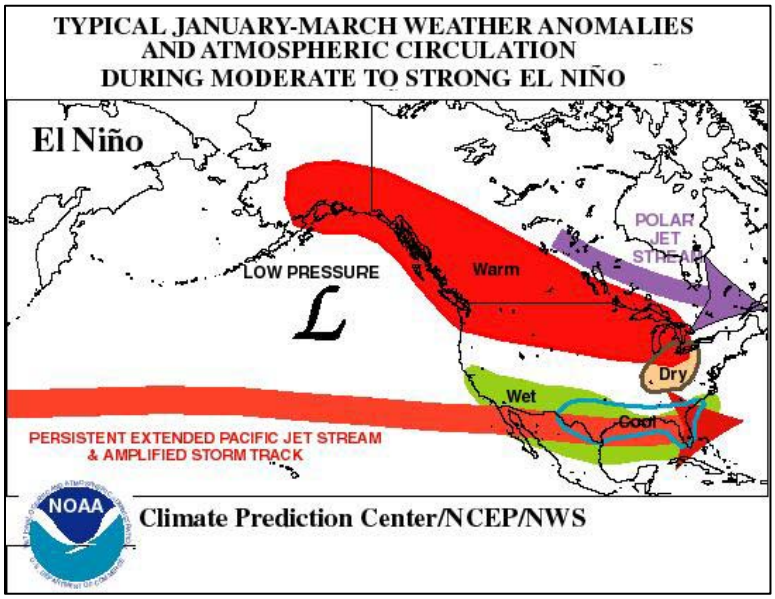
Weather Overview

The Midwest Climate Watch webpage is a great help to identify broad scale regional weather events. This site is readily available to the public, and it includes statewide weather summaries for every state in the region. Check it out at http://mcc.sws.uiuc.edu/cliwatch. The NOAA National Weather Service Climate Prediction Center also provides detailed climatic information on their websites.



Across the Central States, the maps to the right indicate that we've generally had a cool, wet winter. In some places (particularly Missouri), the temperatures have been cool enough to prevent snow from melting off quickly after snow events, so the snow cover has been more persistent. The extended snow cover could lead to an increase in survival of insects that overwinter in the soil and litter, as the snow provided good protection from extreme temperature fluctuations. We have no persistent drought effects to complain about, though we might start noticing impacts of excess moisture and flooding in some areas. These impacts are fairly localized, and since I want to focus on regional effects, let's talk about El Niño.

According to NOAA, we are currently in the midst of a strong and mature El Niño which most models predict will continue until at least spring 2010. El Niño – literally "little boy" – is a warming event in the Pacific Ocean near the equator. To be considered a full-fledged El Niño episode, sea surface temperatures in the equatorial Pacific Ocean must be sustained at 1.0ºC to 2.5ºC above-average for 5consecutive overlapping 3-month periods; the last such episode extended from July 2006 to February 2007. Our current episode began during the May-June-July 2009 period.



El Niño episodes can cause some predictable weather patterns, depending on where you are located. For the contiguous United States, potential El Niño wintertime impacts include above-average precipitation for the southern tier of the country, with below-average precipitation in the Pacific Northwest and Ohio Valley. Below-average snowfall and above-average temperatures are most likely across the northern tier of states (excluding New England), while below-average temperatures are more likely for the south-central and southeastern states. And most of our Central States fall smack dab in the middle of the area where knowledge of the status of El Niño provides practically zero predictive value.

If the El Niño pattern extends into spring and summer, there are a couple of additional predictive pieces we can pull out. The chances for the continental U.S. and the Caribbean Islands to experience a hurricane decrease during El Niño. Since major rain events often push into our region following hurricanes, this chance may be reduced this year. However, to counter this, during El Niño the jet stream is strongly oriented from west to east across the southern portion of the United States. Thus, the Southeast region (perhaps creeping up into our Southern tier??) becomes more susceptible to severe weather outbreaks and tornadoes. You can feel confident now knowing that due to either El Niño or climate change, we're likely to see severe weather in our forests this spring. While I'm on this predictive roll, I should also let you know that I think someone somewhere will win the lottery sometime this month. I also think that if you are in the Central States, you can find better predictors of upcoming weather than El Nino.

What else is being reported across the Region

Bacterial Leaf Scorch

Bacterial leaf scorch (BLS) is caused by the bacterium *Xylella fastidiosa*. It occurs throughout the East, Southeast, some Midwestern states, and Texas. Tree hosts that it has been confirmed on include elm, sycamore, oak, maple, mulberry, sweet gum and ash. The pathogen lives in the xylem vessels of host plant and blocks xylem vessels in leaf veins, causing moisture stress and scorch symptoms. *Xylella* is transmitted by xylem-feeding insects.

In 2008, a large regional survey was initiated to determine the distribution of BLS, particularly at the northern edge of the known range (see the January 2009 CSFHW for a description of this study). In 2009, many states submitted additional samples of symptomatic leaves for analysis. The results of the 2009 survey are listed below.

State	Number of positive/number of samples	Locations (Counties) confirmed in 2009
Illinois	none / 13 samples	
Indiana	1 / 15	Tippecanoe Co.
Missouri	5 / 21	St. Charles Co., Boone Co., City of St. Louis
Wisconsin	2 / 33	Dane Co.
Kansas	1 / 8	Ellis Co
Michigan	1 / 118	Lenawee Co
Minnesota	none / 16	
Nebraska	none / 1	
North Dakota	none / 66	
South Dakota	none / 2	
Utah	none / 9	

Wisconsin continues to be our northernmost confirmed location, and occurrence of BLS in the Midwest continues to be sporadic. Damage from BLS to hardwoods in the Northeast demonstrates the potential of this pathogen to damage valuable shade trees, so we should continue to be aware of this pest.

Feature Topic: **Thousand Cankers Disease of Black Walnut: A New Pest Threatens Black Walnut Trees**

By Bruce Moltzan, USFS WO, Dale Starkey, USFS Region 8 Forest Health Protection, Joe Pase, Texas Forest Service, and Jennifer Juzwik, USFS NRS. (Technical content adapted from information provided by Dale Starkey, Joe Pase, and Colorado State University (http://www.ext.colostate.edu/pubs/insect/0812_alert.pdf).)

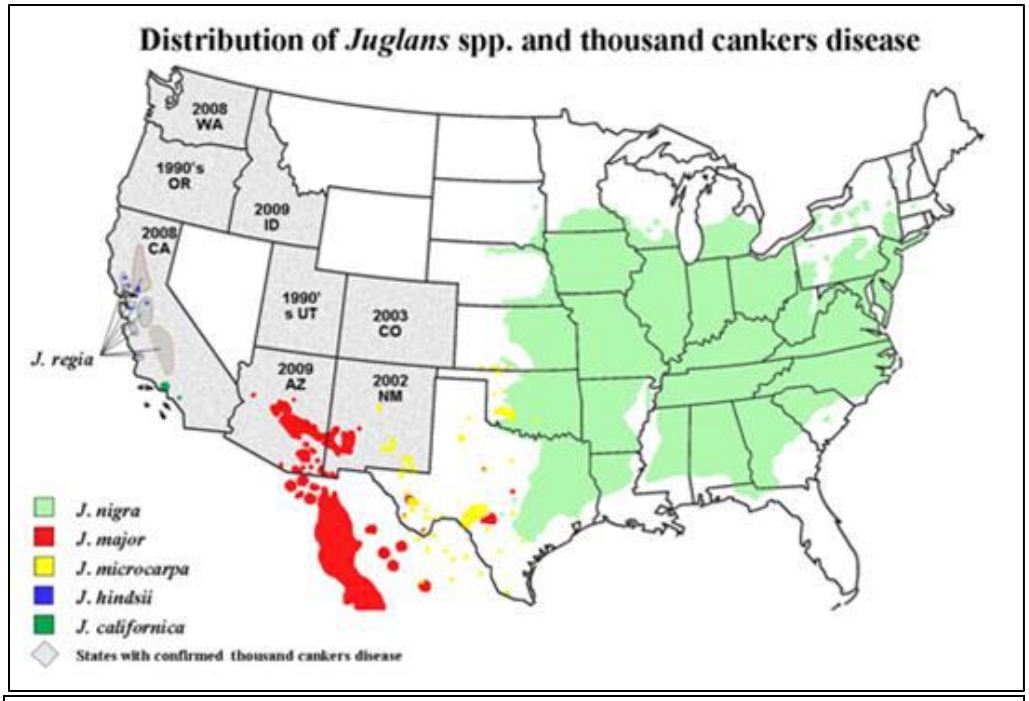
Overview of the situation

A newly described disease is threatening walnut trees (*Juglans* spp.) in the central states. Damage can be severe on black walnut (*Juglan nigra*) planted outside its natural range, especially in the western United States. Thousand Cankers Disease (TCD) is the result of an association between the black walnut twig beetle (*Pityophthorus juglandis*) and a canker causing fungus. *Geosmithia morbida* is the proposed name for this fungus (Tisserat et al. in press). The beetles feed on walnut and in so doing transmit spores of the fungus to the tree, initiating infections. Numerous cankers form due to thousands of beetle attacks on a single branch or main stem, which causes trees to decline and die. Cankers are not evident on the exterior bark of the tree and initial attacks by the beetle are difficult to detect. Trees that have been infected exhibit signs of decline, dieback, thinning, chlorosis, and mortality. By the time symptoms are expressed, trees often die the following growing season.

Landscape black walnut showing thinning crown and dieback in the canopy. *Photo by Bruce Moltzan, USFS.*

The walnut twig beetle is native to North America, originally described in 1928 based on specimens collected in Grant County, New Mexico. The primary range of the beetle has been listed as New Mexico, Arizona, and Chihuahua, Mexico, and this range coincides roughly with the distribution of Arizona walnut (*Juglans major*). During the past 10 years, an unusual decline of eastern black walnut (*Juglans nigra*) has been observed in several western states. These eastern black walnuts are planted in urban and rural areas, and tree farms, and up until recently have generally grown very well. Interestingly, the insect-fungus- complex has been associated with Arizona walnut for many years, but causes little damage on this host.

The first published record of eastern black walnut mortality associated with the walnut twig beetle was in northern New Mexico where large numbers of mature eastern black walnut died in 2001. However, eastern black walnut mortality from undetermined cause occurred in the early 1990s in Utah and records of the beetle from Utah date to 1988. Similar widespread decline of eastern black walnut has been reported in



Confirmed locations of Thousand Canker Disease, along with natural distribution of *Juglans* spp. *Map provided by Andrew D. Graves, Dept. of Plan Pathology, UC-Davis.*

Idaho, Oregon, Washington, and Colorado during the past 10-15 years. In those communities where the insect has been detected, the majority of eastern black walnut has since died. Prior to these recent reports, walnut twig beetle was not associated with any significant *Juglans* mortality.

Eastern black walnut is apparently highly susceptible to the beetle-fungus complex and attacked trees almost always succumb and die. Trees in some Colorado cities, including Boulder, Colorado Springs, and Denver, have been hit particularly hard. The severity of the situation is very apparent in Boulder where over 600 trees, the majority of black walnut in that municipality, have been killed and removed in the past three years.

There appears to be a range in susceptibility of *Juglans* species and related hosts (e.g., *Carya* spp. -- pecan and hickory) to *Geosmithia 'morbida'*. Eastern black walnut is very susceptible, while Arizona walnut (*J. major*) and little walnut (*J. microcarpa*) develop more restricted cankers, perhaps indicating some level of resistance.

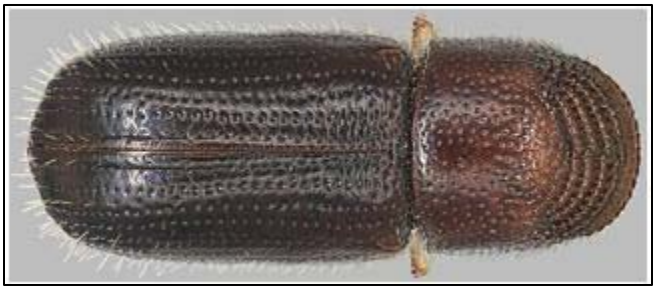
Attacks by the walnut twig beetle and the resulting canker (dark areas) caused by *Geosmithia 'morbida'*. *Photo provided by Bruce Moltzan, USFS.*

Details on the Biology

The walnut twig beetle is a minute (1.5-1.9 mm, about 1/16"), yellowish-brown bark beetle. It can be readily distinguished from other members of the genus *Pityophthorus* by the 4 to 6 concentric rows of dot-like "bumps" on the prothorax, usually broken and at the median line. Despite the twig beetle's common name, attacks by adult *P. juglandis* and larval development in eastern black walnut rarely occur in twigs. Instead, the beetles prefer to attack and lay eggs in branches about 1" in diameter or larger. Very large branches and even the trunk can be colonized during advanced stages of TCD.

The beetles spend the winter as adults within cavities excavated in the bark of the trunk. Adults resume activity by late April and most fly to branches to mate and initiate new tunnels for egg galleries. During tunneling, the *Geosmithia 'morbida'* is introduced. Beetles may tunnel in several times before initiating a gallery. Larvae feed for 4-6 weeks under the bark in meandering tunnels that run perpendicular to the egg gallery and pupate at the end of the tunnel. Adults emerge to produce a second generation in early summer. Peak flight activity of adults occurs from mid-July through late August and decline as temperatures cool.

Initially, small, diffuse, dark brown to black cankers will form where beetles attack. Then multiple cankers eventually coalesce to produce girdling, resulting in branch dieback. TCD cankers are not visible unless bark is removed, but a dark brown to black stain on the bark surface or in bark cracks often indicates the presence of a canker. The inner bark and cambium below the bark surface on the canker face will be macerated, water-soaked, and stained dark brown to black. The walnut twig beetle and the fungus are often found in the macerated bark.



Walnut twig beetle, top view. Note the concentric rows of asperites on the prothorax which distinguish this bark beetle from other species of *Pityophthorus*. *Photograph by Jim LaBonte, Oregon Department of Agriculture.*

Other cankers develop on black walnut trees in advanced stages of decline. These cankers are much larger than TCD cankers and are caused by another canker forming fungus, *Fusarium solani*, and can be typically found at the base of the main stem. They may encompass more than half the circumference of the trunk.

What is being done?
A national response plan is being coordinated by the USFS with multiple stakeholder input. One of the first steps is delineation. It remains uncertain as to whether TCD will move into the native range of eastern black walnut, though some researchers suggest that the impact could be severe. Some states, such as Missouri and Indiana, have already begun to develop regulatory efforts on the movement of black walnut from infected areas to the east. Effective controls for TCD have not yet been developed.

Currently, efforts are underway to delineate TCD distribution along the western edge of the native range of black walnut through surveys. Scientists at the USFS Northern Research Station (NRS) are working together with colleagues from Colorado State University, University of Missouri and Northeastern Area State & Private Forestry forest health program to conduct a targeted field survey for both organisms in Missouri, Iowa, Minnesota, Nebraska and Kansas in 2010. Via a newsletter of the growers' association, walnut producers will be asked to submit information and samples on any black walnut exhibiting decline symptoms characteristic of TCD in their plantations. Reports of walnut with decline symptoms and samples will also be solicited from natural resources personnel and land managers for riparian areas and from city foresters and commercial arborists in the same states. Follow-up field surveys and additional sampling will be conducted for those plantations, riparian forests and urban and community forests and roadways whose samples yield the fungus or exhibit evidence of *Pityophthorus* colonization or canker presence. Affected branches of symptomatic trees will be collected for insect emergence or for visual examination of beetle or gallery presence. The presence of fungi associated with necrotic tissue or obvious cankers will be determined through isolation based on protocols for *Geosmithia* and other putative pathogens reported on *J. nigra*. Because *Geosmithia* species are common microbial associates of bark beetles, the scientists will also assay *Scolytus quadrispinosus* for presence of such species. *S. quadrispinosus* is associated with extensive canker occurrence and rapid crown decline in *Carya cordiformis* (family Juglandaceae) in north central and northeastern states. Much smaller cankers are caused by *F. solani* compared to those caused by *Ceratocystis smalleyi* on declining *C. cordiformis*. In the TCD situation, cankers caused by *F. solani* on *J. nigra* are considered to develop later in the progression of the disease compared to cankers caused by *G. 'morbida'*. Thus, *F. solani* is considered a secondary pathogen in both TCD and in hickory decline. Morphological and molecular characteristics of all *Geosmithia* and *Fusarium* isolates obtained from *Juglans* and *Carya* species as well as from bark beetles will be compared with isolates from Colorado.

If you observe declining or dying walnut trees in the Central States, please use the form on the last page of this update to submit information to the NRS TCD research team.

This newsletter is also available on the WWW at:
http://na.fs.fed.us/fhp/fhw/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

POTENTIAL TREES FOR 2010 THOUSAND CANKERS DISEASE TARGETED SURVEY

(Dieback in Black Walnut, Pecan and Hickory in Missouri, Iowa, Minnesota and neighboring states)

USDA Forest Service specialists plan to conduct a targeted survey of natural stands and plantations of walnut, pecan, and hickories with reported occurrence of trees exhibiting unexplained dieback in the their crowns. Samples will be collected from ≥ 2 in. diameter branches from affected trees. Insects and fungi associated with the symptomatic branches will be identified. The geographic focus of the survey will be states on the western edge of the range of *Juglans nigra* (e.g. Minnesota, Iowa, Missouri, Nebraska, and Kansas) although other Midwestern states are not excluded. If you have a plantation, stand (particularly in a riparian area) or urban and community forest or roadway trees meeting these criteria and you would like to have your situation considered, please complete the form below and submit by mail or send an email message to one of the following individuals. Additional information, including a permission form for tree health specialists to access the property and collect branch samples, will then be provided.

Please return by mail, email or fax to:

Jennifer Juzwik / Mike Ostry
USDA Forest Service, 1561 Lindig St.
St. Paul, MN 55108
E-mail: jjuzwik@fs.fed.us or mostry@fs.fed.us
Facsimile: (651) 649-5040
Telephone: (651) 649-5114 (Juzwik) and (651) 649-5113 (Ostry)

SUBMITTER's CONTACT INFORMATION: Date of submission:

Name: _____

Position/Title: _____ Agency:_____

Address: _____

_____ Zip Code:_____

Telephone: ( )_____Fax:( )_____email: _____

LANDOWNER OR LAND MANAGER INFORMATION:

Name: _____

Address: _____

_____ Zip Code:_____

Telephone: ( )_____Fax:( )_____email: _____

Location of tree(s) if different than above address:

Township _____ Range _____ Section _____

Other: (e.g. GPS coordinates) _____

_____

JUGLANDACEAE INFORMATION: Please fill in the section with as much information as you have

DESCRIPTION OF THE SITUATION

Situation: (circle response) Plantation? Natural Stand? Urban & Community Forest? Roadway? Riparian Area?

Species: _____ Approx. how many trees are affected? _____

Approximate age of affected tree(s): _____

Was this / were these tree(s) planted?_____ Did it / they regenerate naturally? _____ Unknown:_____

What size: Juvenile – less than 6 inches in diameter at 4 feet from ground _____

Immature – 6 inches to 12 inches in diameter _____

Mature – greater than 12 inches in diameter _____

Have these tree ever had a seed crop?_____ Do these trees appear mostly healthy?_____

Do they have thinning foliage?_____, dying/dead branches?___, small, discolored leaves? _____

Are there obvious signs of disease (e.g. cankers) or insect infestation (e.g. holes) on affected trees?_____

_____

Is this tree or are the trees likely to be removed soon? If so, when?_____