

# green horizons

Growing tomorrow's future today.

Summer 2013

A newsletter from the Center for Agroforestry in  
conjunction with the Forest and Woodland Association of Missouri

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Mike Gold, Mark Coggeshall and Katie Moritz, editors

## Growers, scientists talk shop at first-ever Symposium on Elderberry

By **KATIE MORITZ**

MU Center for Agroforestry Intern

Fledgling St. Louisan elderberry grower Joe Johnson came to the first ever International Symposium on Elderberry with one directive in mind: to develop his unique elderberry product idea. But what that idea is, he wouldn't say.

"If I tell you, someone will steal my idea," Johnson said, laughing.

Johnson did say his product will make use of the elderberry flowers rather than the berries. Since this is his first year harvesting, he said, he still has a lot to learn. The most interesting thing he picked up from the symposium was the European method of elderberry growing, which differs from the method used in North America.

Johnson was one of about 120 elderberry growers, scientists and enthusiasts that descended on Columbia for the symposium, June 9-14. The event, a multi-national collaboration led by MU's Andrew Thomas, was convened under the auspices of the International Society of Horticulture Science. Presentations took place at Stoney Creek Inn and featured more than 60 talks on elderberries given by experts from over 10 different countries, including the US, Canada, Israel, Denmark, Hungary and Germany. Sessions focused on a wide array of topics including: Elderberry and Human Health, Biochemistry, Horticulture, Botany and Ethnobotany, Markets and Industry. Research



KATIE MORITZ

Symposium attendees check out elderberry plants before dinner at Nature's Organic Haven Farm in Hermann

papers presented at the Symposium will be published in a peer-reviewed volume of *Acta Horticulturae*.

Throughout the week, attendees took trips to the Missouri Botanical Gardens in St. Louis, Eridu Farms in Hartsburg and Nature's Organic Haven Farm in Hermann, where a dinner party was held.

Speaker highlights included the keynote talk, "Pharmacological and Clinical Effects of Elderberry Fruit," by Dr. Sigrun Chrubasik, of the University of Freiberg in Germany. She spoke about the potential for elderberry as a treatment for viruses such as herpes and HIV. There are also studies showing elderberry as a protection against the flu. Although the science is far from proven, the berry has a lot of potential uses, she said.

Denis Charlebois, of Agriculture and Agri-Food Canada, presented his talk "Did You Say Elderberry? Some Pitfalls to Avoid," about common elderberry misconceptions. He joked about the diversity of the symposium's attendees: "I don't know how much you paid to be here, but so far you

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have heard a German accent, a Danish accent and now a French-Canadian accent. It's quite unusual." He said people often ask the same questions over and over about elderberry: "What does it taste like? Is it poisonous?" "Taste it and you will see!" Charlebois joked.

Successful businessman Sylvain Mercier spoke about the elderberry company he developed and runs with his wife, Jacinthe Desmarais. SURO, a medicinal product that comes in syrup and salve forms, is sold across Canada and online. Mercier emphasized how important it was to effectively market his product and make it look professional. He even entered an agreement with his bottler so SURO would be the only product on the market with its packaging, he said.

"If you have bad quality, you will get bad feedback," Mercier said. "If [consumers] don't like it, they'll tell a lot of people. Don't make the mistake of buying cheap to save money."

Scientific presentations were given by MU researchers from the Center for Agroforestry, Division of Plant Sciences, Center for Botanical Interaction Studies, Division of Animal Sciences and Biochemistry. The Center for Agroforestry was well-represented, with presentations by Dr. Mike Gold,

Ina Cernusca and Dr. Chung-Ho Lin.

Gold presented on the elderberry decision support tool available free on the center website. The tool helps growers determine financial outcomes depending on decisions they make about irrigation, pest control and other variables, Gold said. Growers can adjust the tool based on their own experiences. The tool is meant to show how much money a grower could make in different situations, and how long it would take for a grower to make a profit.

"We want this to reflect the reality of the grower so it's a useful tool," he said.

Lin spoke on the health benefits of bioactive phytochemicals in eastern redcedar, including as a potential treatment for melanoma. Redcedar also has phytochemicals with anti-MRSA properties. While Lin's research was conducted on eastern redcedar, the approach could have crossover potential to the study of elderberry.

Cernusca focused on elderberry marketing. She led a research team that conducted a study on the elderberry market. The 74 survey respondents reported on their challenges for entry into this market. Many of them said there was a lack of interest and/or knowledge of elderberry

## Join the Missouri Forestkeepers Network

As a valued member of the Missouri Forestkeepers Network, a free organization administered by Forest ReLeaf of Missouri in partnership with the Missouri Department of Conservation, you have the opportunity to play an essential role in the future of Missouri's trees and forests and help foster a state of forest health for generations to come.

The Missouri Forestkeepers Network's mission is to develop a network of informed citizens working to conserve, sustain and enhance Missouri's urban and rural forest resources through volunteerism, advocacy and management. It is designed to provide sound scientific information on tree care and management to Missourians. Participants are encouraged to take an active role in the care of our forests through a variety of activities and training, but each individual determines their level of involvement.

There are currently over 2,500 Forestkeepers from all regions of Missouri acting as the "eyes of the forest" as they gather data from their selected site several times a year. Data is compiled and given to the Missouri Department of Conservation to determine envi-

ronmental trends for that year. As a thank-you to dedicated members, each time data reports are completed and submitted they are able to select an incentive gift.

As a member, you have access to data and resources pertinent to forestry and conservation topics. Forestkeepers are alerted of statewide workshops, events and activities and are encouraged to attend the Annual Forestkeepers Conference held each summer. Members receive quarterly newsletters and technical bulletins as well as an Annual Report that summarizes the previous year's volunteer data and statistics and spotlights outstanding Forestkeepers.

Joining is easy! Visit [www.forestkeepers.org/about-forestkeepers/join-forestkeepers/](http://www.forestkeepers.org/about-forestkeepers/join-forestkeepers/) to sign up. Once your application is processed, you or your group will receive a new member kit with information and current data requests. Join this network of landowners working together to conserve Missouri's forests.

*Submitted by Colleen Duhart, Administrative and Communications Coordinator at Forest ReLeaf of Missouri.*



Rodger Lenhardt of Norm's Farm in North Carolina speaks with a couple attendees about his products during a break at the symposium.

equipment required to process elderberries can be expensive, she said. However, if farmers already produce other crops and can use that equipment for elderberry production, this can lower the cost of entry into the market. Another aspect of the current elderberry market entry is that there is low competition within the industry. New entrants help grow the market and can differentiate through innovation, she said. In conclusion, she mentioned that the industry is in its infancy but growing rapidly. Although there are many part-time participants and hobbyists at the present time, the few large-scale producers play an important role in growing the industry for the benefit of all market participants.

"Everybody is learning by doing and going through trial by error," Cernusca said.

by the public and also by lenders, making it hard to get start-up loans. There is also a shortage of available fruit, and the

## Private Forest Owners Make Significant Contribution to U.S. Economy, New Report Shows

The National Alliance of Forest Owners (NAFO) recently released new data confirming the strong value forest owners provide to the U.S. economy. "The Economic Impact of Privately-Owned Forest in the United States" reveals forest owners support 2.4 million jobs, \$87 billion in payroll, \$223 billion in sales and 5.7 percent of all U.S. manufacturing. In addition to the full report, NAFO's interactive U.S. map provides a convenient snapshot of individual state data.

"Private forest owners are a driver of the U.S. economy by providing millions of jobs while producing a broad range of goods and services that improve quality of life in every home and community," said Dave Tenny, NAFO President and CEO. "Private forest owners are able to provide these substantial benefits because they recognize that responsible management today yields sustainable economic and environmental benefits over the long term."

The report, conducted by Forest2Market, is an update to NAFO's inaugural report in 2009. It provides national, regional and state-specific data on jobs, payroll, sales, acreage ownership and contribution to overall manufacturing and gross domestic product. Data is based on 2010, the most recent and complete year for which data is available.

Strong markets for working forests enable forest owners to make investments in forest stewardship that result in the following:

- The U.S. grows more trees than it harvests. USDA reports that the standing inventory (volume of growing trees) in U.S. forests has grown by 50% between 1953 and 2011.
- For the past 100 years, the amount of forestland in

the United States has remained relatively stable, at around 755 million acres, thanks to improvements in markets for forest products and reforestation efforts.

- More than half of the freshwater supply, 53 percent, originates on forestlands. Outside of the Western region of the U.S., state and private lands provide 89 percent or higher.
- 20% of US forestland is under some type of conservation program, which is almost twice the world average of 11%.
- Assessments of biodiversity on the nation's forests have found that the annual rate at which species are listed as threatened or endangered has declined fivefold.
- Private working forests are essential to achieving our national renewable energy and climate change objectives.
- Energy from forest biomass accounts for roughly 22.2% of renewable energy consumption nationally.
- The EPA reports that carbon storage in U.S. forests continues to increase, offsetting about 14% of annual U.S. emissions from burning fossil fuels.

*NAFO is made of private forest owners committed to advancing federal policies that promote economic and environmental benefits of privately-owned forests at the national level.*

*NAFO membership includes over 80 million acres of private forestland in 47 states. Working forests in the U.S. support 2.4 million jobs. The full economic impact of America's working forests is at [www.nafoalliance.org/economic-impact-report](http://www.nafoalliance.org/economic-impact-report).*





KATIE MORITZ

A donkey, a natural guardian against predators, protects a bunch of baby goats on Busby Farm.

## Local scientist studies goat silvopasture

By **KATIE MORITZ**

MU Center for Agroforestry Intern

One efficient method to clear invasive plant species from woodlands turns out to have four legs, an insatiable appetite and a very low environmental impact, according to a local scientist's findings. Since the fall of 2011, Dr. Charlotte Clifford-Rathert, DVM, an assistant professor at Lincoln University in Jefferson City since 2007, has been studying the use of goats to restore native grasses in woodlands at the school's 280-acre Busby Farm, Missouri's largest organic research farm.

She's found this system is beneficial for the goats and the land. "This is a perfect place for goats," Clifford-Rathert said. "Instead of mechanically clearing you can use goats for less of an impact on the environment. I'm really anxious for the next two years to show, 'See? it really does work.'"

To conduct the three-year study, Clifford-Rathert partitioned the farm's 42 acres of woodland into six, seven-acre blocks. Three of the six seven-acre

woodland blocks will be left ungrazed. The other three seven-acre blocks will each be partitioned into 7, one-acre paddocks, and rotationally grazed by goats. The goats munch on invasive species such as multiflora rose and Japanese honeysuckle, leaving the forest floor weed free and able to regrow native plants. Clifford-Rathert and her team of two helpers plus student farm workers move goats from acre to acre every four to seven days and study the effects the goats have on the woodlands.

For the first 10 days of the study each year — it usually begins May 1 — the goats wear GPS-enabled pedometers to track their movements. Clifford-Rathert wants to determine if the goats graze in patterns. "We want to see if they follow the same path as last year, if each year they remember where the plants are," she said. The research team observes the land and goats closely, monitoring weight gain and loss and intestinal parasites in the goats and soil fertility and compaction.

The grazing has cleaned up the forest floor, seriously diminishing invasive plants, and the goats have far less parasites than if they had been grazing traditionally,





KATIE MORITZ

**TOP:** Charlotte Clifford-Rathert at Busby Farm in Jefferson City.

**BOTTOM:** One of Clifford-Rathert’s goats lays just outside the woodlands while another munches on foliage in the background.

Clifford-Rathert said.

“As long as they’re eating the brush, they’re not reingesting fecal material on the ground,” she said. “When the goats eat brush this keeps their heads up and prevents them from eating off the ground, reingesting parasite larva on the grass.”

Learning about the effects of woodland grazing has several benefits, she said. Farmers can make money on a wood crop by making their woodlands usable. Clifford-Rathert said farmers could get a good wood crop every 10 to 15 years, with a meat crop in between, when utilizing managed intensive grazing with goats.

Cleaning up woodlands also diminishes the risk for forest fires, Clifford-Rathert said.

She said the U.S. Department of Agriculture was interested in her research because it could provide solutions to forest fire problems. The USDA provided the grant for the project. “If that stuff is all gone, there’s no fuel to the fire,” she said.

In addition to benefiting farmers and providing a fix for forest fires, carefully managed woodland grazing can serve as a tool to restore the woods to a more natural state. Clifford-Rathert said she’s become very excited about the work she’s doing at Busby Farm.

“It’s my passion; it’s really become what I get up in the morning to do,” she said. “I see the potential, one year later, two years later, three years later. I can’t wait for it.”

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**Editors’ note:**

*Goat silvopasture is best suited to extremely altered forest ecosystems with many exotics and few natives. Controlled grazing with goats will enable the landowner to control invasive species but if not carefully managed, may also have less desired woodland impacts. For example, goats and other livestock will eat desirable oak seedlings needed for regeneration of the future forest. Elimination of native midstory vegetation may reduce certain wildlife benefits.*

*Regardless of livestock type, unregulated grazing in the woods can cause damage to desirable trees and understory vegetation, and can also create erosion problems.*

*Consult with a professional forester to determine if this is a good plan for your woods and work with a grazing specialist to design a system that will meet your objectives.*



# Before and after



CHARLOTTE CLIFFORD-RATHERT

The same patch of woodland over the course of a few days. It is part of a one-third-acre area where 14, 6-month-old male goats grazed and quickly cleaned up.



# Missouri Tree Farm Conference hosts 65 landowners for workshops

**By Brian Schweiss**

Forestry Field Program Supervisor

Despite the threat of rain, 65 landowners and agency representatives gathered at the 2013 Tree Farm Conference in and near Kirksville, Missouri. The event was a combination of workshops and field tours that appealed to a wide audience.

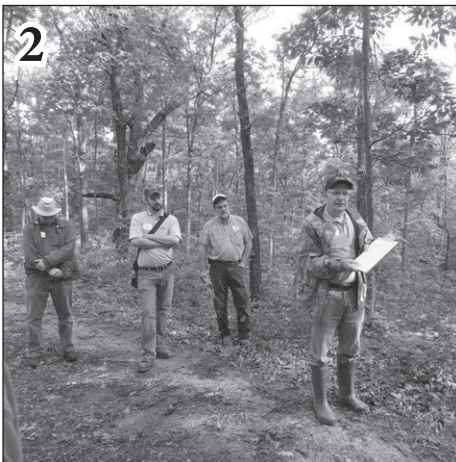
(1) Friday workshops provided hands on experience on inoculating logs for shiitake mushroom production. This program was well suited for the backyard grower to the serious commercial producer. Stay tuned to the Forest and Woodland Association of Missouri for the “Backyard Shiitake Workshop” to be held in February in central Missouri. More details will follow. An additional workshop was held on elderberry production.

(2) Ed Keyser, the 2012 Tree Farmer of the Year, discussed his woodland management which included thinning for wildlife and a timber sale. Attendees also learned about controlling unwanted plants such as autumn olive and multiflora rose.

(3) At Ed’s Tree farm they also discussed food plots from soil testing to suitable green browse and other crops for deer and turkey.

(4) Participants learned about log and tree values for money and wildlife. They then watched as one log was cut on a portable band saw mill.

(5) The Awards luncheon and the many events gave everyone a good opportunity to network and learn from each other. This is what Tree Farm is all about.



# Ash, pine and walnut products quarantined to protect Missouri trees

## Ash wood product quarantine expanded to limit spread of Emerald Ash Borer

The Missouri Department of Agriculture has expanded the state's quarantine regulating the movement of many ash wood products. The quarantine, an effort to reduce the spread of the Emerald Ash Borer, a one-half inch long emerald green-colored beetle, now includes the counties in which the borer has been previously found as well as two additional counties.

The quarantine expansion comes as a result of borers identified and confirmed by USDA staff during routine survey efforts this month. The borers were found in Bollinger County in southeastern Missouri and Pulaski County in south-central Missouri.

The quarantine limits the movement of certain wood products from these counties most likely to transport the borer. Affected products, which may not be moved without first entering into a compliance agreement through USDA-APHIS Plant Protection and Quarantine, include any part of an ash tree, from logs and green lumber, to compost, bark and chips, as well as ash nursery stock and all hardwood firewood.

Detailed information on movement of ash products under a compliance agreement is available online at [eab.missouri.edu](http://eab.missouri.edu). Much of the pests' spread is attributed to humans transporting it under the bark of firewood, logs and tree debris. As such, Missouri's quarantines prohibit both interstate and intrastate movement of those products.

The Missouri Departments of Agriculture, Conservation and Natural Resources work with federal staff from USDA Plant Protection and Quarantine and the U.S. Army Corps of Engineers, as well as researchers at the University of Missouri, to monitor Missouri's forests and urban areas for the insect. Staff also inspect incoming shipments of nursery stock, which may harbor the borers and other invasive pests.

**"Ash," Continued on page 10**

## Pine product quarantine now includes Adair, Clark counties

Missouri's quarantine on pine products in northeastern Missouri has been expanded to include Adair and Clark counties. The quarantine, an effort to reduce the spread of the match head-sized Pine Shoot Beetle, initially affected Macon, Marion and Lewis counties and was recently expanded as a result of signs of the beetle found during routine survey efforts.

Following last year's findings of the invasive Pine Shoot Beetle in northeastern Missouri, the Missouri Department of Agriculture issued a quarantine limiting the movement of pine trees and wood out of three counties. Affected products, which include Christmas trees, pine nursery stock, bark mulch and pine logs, may not be moved out of the quarantined counties without first entering into a compliance agreement through USDA-APHIS Plant Protection and Quarantine.

Detailed information on moving pine products under a compliance agreement is available by contacting USDA-APHIS.

A native of Europe, the beetles are black and brown in color, roughly 1/8 inch in length and have a cylindrical body shape. The Pine Shoot Beetle feeds on new pine tree shoots, stunting the growth of the trees. The beetle may also attack stressed pine trees by breeding under the bark. The beetles can cause severe decline in the health of trees, and in some cases, death.

The Missouri departments of Agriculture, Conservation and Natural Resources work with federal staff from USDA Plant Protection and Quarantine and the U.S. Army Corps of Engineers, as well as researchers at the University of Missouri, to monitor Missouri's forests and urban areas for pests. The agencies also work together to raise awareness of the impact the Pine Shoot Beetle could

**"Pine," Continued on page 10**



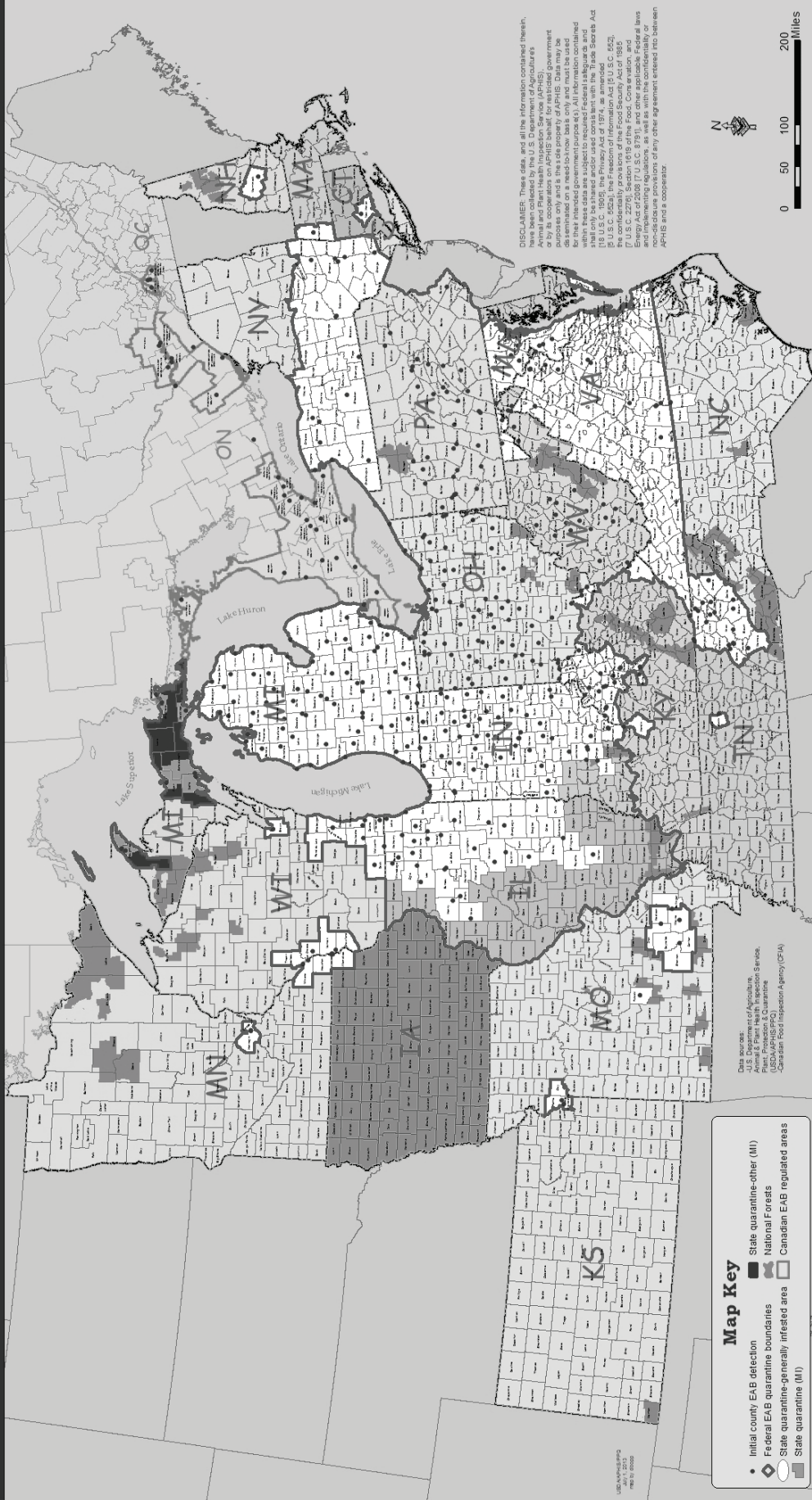


United States  
Department of  
Agriculture

# Cooperative Emerald Ash Borer Project

Initial county EAB detections in North America

July 1, 2013



## EAB detections as of July 1, 2013.

This map can be found at  
<http://emeraldashborer.info/map.cfm>

# Exterior quarantine enacted to protect Missouri black walnut trees

The Missouri Department of Agriculture has enacted a state exterior quarantine to protect Missouri's black walnut resource from Thousand Cankers Disease (TCD). The quarantine prohibits wood products, including walnut bark and all firewood, from infected areas from coming into Missouri. States affected by Missouri's quarantine include Arizona, California, Colorado, Idaho, Nevada, New Mexico, North Carolina, Oregon, Pennsylvania, Tennessee, Utah, Virginia and Washington. Several other states have enacted similar quarantines, including Kansas, Michigan, Nebraska, Oklahoma, Indiana, Minnesota, Wisconsin, Arkansas, Illinois and Ohio. The known infested states of North Carolina, Pennsylvania, Tennessee and Virginia also have state quarantines.

Thousand Cankers Disease is a pest complex that has caused mortality in walnut in many western states. It is now present in the eastern native range of black walnut, but has not been detected in Missouri. TCD is caused by the walnut twig beetle and an associated fungus, and



DR. NED TISSERAT, COLORADO STATE UNIVERSITY

A tree with Thousand Cankers Disease.

black walnut is highly susceptible to this disease.

If you suspect you have seen TCD in Missouri, please contact the Missouri Department of Agriculture, Office of the State Entomologist at (573) 751-5505.

## Ash quarantine

### Continued from page 8

Those agencies also work together to raise awareness on the potential impacts of the Emerald Ash Borer on our state's trees, especially in urban and suburban areas where 30 percent or more of the trees may be ash. Missouri's educational "Don't Move Firewood!" message encouraging individuals to buy or gather firewood where they plan to burn it, can be found everywhere from trade shows to radio public service announcements to highway billboards as part of a statewide effort to slow the insect's spread.

The Emerald Ash Borer quarantine is one of several Missouri has in place to protect the state's trees from invasive forest pests. For the latest updates about the Emerald Ash Borer, plant and pest quarantines and the Missouri Department of Agriculture's other programs, visit [mda.mo.gov](http://mda.mo.gov).

## Pine quarantine

### Continued from page 8

have on Missouri's nearly 225,000 acres of forest pine valued at \$482 million. Staff members also inspect incoming shipments of nursery stock, which may harbor the borers and other invasive pests.

The Pine Shoot Beetle quarantine is one of several Missouri has in place to protect the state's trees from invasive forest pests. Foresters, arborists, landscape and nursery workers and landowners should also be aware of quarantines affecting both ash and walnut wood products from other states, including firewood, as a preventative measure to prevent the spread of Emerald Ash Borer and an infestation of Thousand Cankers Disease of Black Walnut.

For more information about the Pine Shoot Beetle, plant and pest quarantines and the Missouri Department of Agriculture's other programs, visit the Department online at [mda.mo.gov](http://mda.mo.gov).



# green horizons

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***The editorial board is currently being revised.***

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 **The Center for Agroforestry**  
University of Missouri

*A Global Center for Agroforestry, Entrepreneurship and the Environment*

## Calendar of events

**September 19 — Fall Field Day — Forrest Keeling Nursery, Elsberry, Mo.**

**September 22-26 — NASF 2013 Annual Meeting — Hot Springs, Va.**

**September 25-28 — 53rd Annual Black Walnut Festival — Stockton, Mo.**

**September 27 — MNGA Pre-harvest Meeting — Shepherd Farms, Clifton Hill, Mo.**

**October 2-5 — 33rd Annual Brunswick Pecan Festival — Brunswick, Mo.**

**October 4-5 — Missouri Chapter of the Walnut Council — Neosho and Pineville, Mo.**

**October 5 — Eastern Ozarks Forestry Council Landowner Field Day — Bee Rock Land, Raymondville, Mo.**

**October 12 — Great River Road Chestnut Roast — Forrest Keeling Nursery, Elsberry, Mo.**

**October 23-27 — Society of American Foresters, 2013 National Convention — North Charleston, S.C.**