



## A SOUTHERN PEST FINDS A HOME UP NORTH

By Michelle Kijek, University of Wisconsin Graduate Student

Termite infestation does not generate excitement in most people. But U.S. Forest Service Forest Product Laboratory researchers Rachel Arango and Rick Green aren't most people. In fact, this dynamic duo didn't simply find a termite infestation in their laboratory, they strategically built up a colony of 20,000 termites over the past five years. Accommodating the sizable colony in a building that also houses more than 175 employees conducting research on wood use may sound questionable, but it may provide answers to saving one Wisconsin community from termite damage in the future.

Since the mid-1980s, residents of the small central Wisconsin village of Endeavor have sensed they are dealing with a big problem. The 450 residents aren't the only inhabitants of the less than one square mile that Endeavor occupies. Eastern subterranean termites, the ¼-inch-long, cream-colored critters, although rare to Wisconsin, have also taken up residence in Endeavor.

"Most people don't even think about termites in this state," Arango said. "But we definitely do have some isolated pockets of termites, and in Wisconsin these colonies tend to be quite large when compared with colonies down south."

When entomologist Phil Pellitteri, who runs the UW-Extension's insect diagnostic lab, was first contacted about Endeavor's infestation in 1996, the outlook was bleak.

"I heard a comment that they had a researcher come and say this was the worst infestation he's seen in the United States outside of Hawaii," Pellitteri said. "The termites were so bad the tubes were coming from the ceiling down. You would go into the second floor of a house and tap on the windowsill and it was just toast."

That same year, Dow AgroSciences started battling the infestation with experimental termite baiting stations. The trial was suspended prematurely a year later, although some termite reduction was noticed. Almost a decade later, Pellitteri got word of Dr. Green's research on a wood preservative



House damage caused by termite infestation.



that prevented brown rot decay and also acted as a termiticide. Green's newly patented termite bait toxicant—N'N-naphthaloylhydroxylamine (NHA)—proved to be a slow-acting, non-repellant stomach poison, environmentally friendly and perfect for baiting and killing termites.

Given the isolated nature, yet significant size, of the infestation, Green and Arango saw Endeavor as an ideal site to experiment with NHA and the potential for a community-wide eradication scheme. The Endeavor termite eradication team now also includes Dan Keohane of Alternative Pest Solutions (APS), a Madison-based pest control company offering environmentally friendly pest solutions, and Dr. Glen Esenther, a world-renowned termite expert and retired FPL researcher. In December 2005, the team began to implement a plan for community-wide eradication, beginning with a survey sent to Endeavor residents to locate known termite infestations. Endeavor residents have already seen the potential of the research—suppression of termite activity in the downtown area and reduced damage to homes and

(continued on pg. 3)

## NEWSLINE TEAM

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## UPCOMING EVENTS

### 2009 INTERNATIONAL CONFERENCE ON NANOTECHNOLOGY FOR THE FOREST PRODUCTS INDUSTRY

**June 23-26, 2009**

Edmonton, Alberta, Canada: Call for presentations and posters. This annual, internationally recognized event brings together leading researchers, industry experts, government representatives, and other stakeholders to share advances and perspectives, and discuss new ideas and breakthrough concepts on nanotechnology-based advances in the forest products and related industries. For more information, visit <http://www.tappi.org/09Nano>.

### FOREST PRODUCTS SOCIETY 63RD INTERNATIONAL CONVENTION

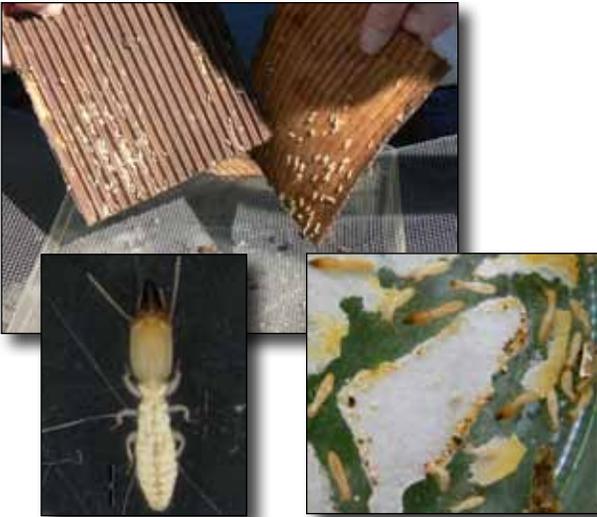
**June 21-23, 2009**

Doubletree Hotel Boise-Riverside, Boise, Idaho, USA: This year's meeting is held in collaboration with the Society of Wood Science and Technology. You will hear from leading architecture firms on innovative uses of forest products and sustainable design. They will highlight some of their creative projects, and then challenge the audience to develop forest products with new attributes, forms, assembly methods, aesthetics, and sustainability metrics. The concurrent technical sessions, developed by leaders of the Technical Interest Groups of the Society, offer great opportunities to network and learn about the latest research results. For a copy of the program and registration information, please visit the Forest Products Society at <http://www.forestprod.org/confic09.html>.

### 6TH INTERNATIONAL SYMPOSIUM ON MOISTURE AND CREEP EFFECTS ON PAPER, BOARD AND CONTAINERS

**July 14-16, 2009**

Monona Terrace Convention Center, Madison, Wisconsin, USA: This symposium will provide an opportunity for research and industry communities to gather and share information. Emphasis will be on topics related to moisture and heat transfer, container design and performance pertaining to lifetime estimations, material characterization and selection, durability and degradation as affected by environment, and new materials, products and processing to enhance container performance. Inquiries should be directed to John Considine, Program Secretary, at [jconsidine@fs.fed.us](mailto:jconsidine@fs.fed.us).



commercial buildings—but not all residents are taking advantage of the opportunity.

“Not all residents have installed bait stations, but some have termites,” June Schumacher, a resident of Endeavor said. “It’s sort of the put-your-head-in-the-sand response. I just truly don’t understand it,” Schumacher added.

“We’ve done everything possible: lots of publicity, free inspections, postcards to people in the infected area, and people still ignore the problem.”

Preliminary monitoring of active termite pockets was initiated in 2006 using 200 baiting stations provided by the Forest Products Laboratory. Once some termite sites were identified, Green and Arango began installing additional commercial baiting stations provided by APS. These bait stations consist of a cylindrical tube baited with a termiticide and placed in the ground. Termites

are recruited to the food source by nest mates, ingest the termiticide, feed other termites, and die. Noticing partial suppression of termite activity in the downtown area, the team began to supplement bait stations using trap-treat-and-release dusting. Dusting groups of termites with NHA, the chemical developed by Green at FPL, along with using the commercial baiting system allows the termites to spread the toxin both by grooming and by sharing food.

“Last year, when we tried a dusting system as a way of termite control, we got a good suppression of activity,” Esenther said. “But we don’t know what that means, so next year we’ll do it again to find out if it had any sustainable effect.” Green and Arango are currently conducting dusting tests on their simulated field colony while the team waits for spring to investigate the Endeavor termite activity.

The team hopes Wisconsin residents across the state take heed of the situation in Endeavor, and use some common sense preventive measures to protect their communities.

“The only way you’re going to get termites north of Janesville is from human transport,” Green said. “Residents should be aware of that. In most of Wisconsin, you introduce them yourselves with either firewood or landscaping timbers such as railroad ties”—the likely culprit for the Endeavor infestation.

“Thirty-one years ago when I first started it seemed I could name the number of infestations in the state on one hand,” Pellitteri said. “Now I’ve run out of toes and fingers. These little pockets keep popping up.”

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## WOOD YOU BELIEVE...

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- In the U.S., there are about 747,000,000 acres of forested land—that’s about a third of the United States.  
– *American Forest and Paper Association*
- A healthy, mature tree has about 200,000 leaves.  
– *Wisconsin Paper Council*
- A wooden pencil can write about 45,000 words or draw a line about 35 miles long.  
– *The Pencil Pages*
- In the United States, it takes approximately 57 million trees per year just to produce the catalogs that are printed.  
– *J.W. Morlan’s Wood Facts*



# WORKSHOP HELD TO PREVENT SPREAD OF EMERALD ASH BORER

*By Jaina Roth, Editorial Assistant, Forest Products Laboratory*

Representatives from both regulatory field staff and firewood producers from eight states convened to learn new developments on implementing heat treatment processes and to address how to safely treat firewood used for interstate commerce. The workshop concluded with an on-site heat treatment demonstration located at Green Thumb Farm in Prairie du Sac, Wisconsin. Funding for the project is provided by the U.S. Forest Service Wood Education and Resource Center.

Several state firewood producers and agencies met in early March at Madison's Forest Products Laboratory (FPL) to learn more about what insects currently fall under state and Federal quarantine regulations, how to become a certified producer, treatment techniques—including heat treatment (HT)—to eliminate pests, and the latest research developments.

JoAnn Cruse, State Plant Health Director from USDA APHIS (Animal and Plant Health Inspection Service), began the presentation and said that in addition to the emerald ash borer (EAB) found in eight states (Michigan, Indiana, Ohio, Massachusetts, Pennsylvania, Illinois, West Virginia, and Wisconsin, with Wisconsin currently the most infested), several beetles, wasps, and the gypsy moth can also travel with firewood, increasing the need for pest quarantines and wood industry regulation.

Cruse says that after May 1, if a firewood consumer does not burn the wood where it is purchased, transit of logs, timber, and firewood will be permitted only if the transportation meets regulation requirements in each restricted area. Moving firewood outside the 50-mile radius increases the likelihood of EAB infestation, as many pests hatch during the adult flight season of April through September.

To slow the movement of EAB, Robert Dahl, Section Chief at the Wisconsin Department of Agriculture, says that to heat-treat firewood at 160°F at the core for 75 minutes still might be the best way to combat pests. Other methods include debarking the wood plus one-half inch, seasoning for two or more years (a regulation only in Wisconsin), or fumigation. "To be a 'firewood dealer' means a person who regularly sells or distributes firewood in the state," Dahl says. The annual certification fee in Wisconsin is \$50.



Scott Myers, an entomologist with APHIS, says the ideal heat treatment measures include both time and temperature. Although it may be easier and cheaper to simply heat-treat longer rather than increasing temperature, his research has proven that 160°F is the temperature required to kill EAB in particular. Using a process called thermal mapping to track the temperature, Myers inserts probes in the center along the length of a piece of firewood. "These temperature data loggers produce thermal mapping read-outs, which can help us determine if a kiln is operating at its proper eradicating ideal," Myers says. Cold spots in the kiln due to faulty fans, restricted air flow, or faulty sensors could cause failed certifications.



Heat treatment was first used on pallet lumber for overseas transportation and to prevent the spread of foreign invasives, says Rick Bergman, FPL Research Scientist. Treatment of firewood has the same objectives: using heat to kill any living organism as a quarantine treatment for insects.

Xiping Wang, Senior Research Associate from the FPL and the Natural Resources Research Institute (NRRI) at the University of Minnesota-Duluth, concluded the workshop with his presentation about HT options, temperature monitoring, and how thermal verification works. Although the EAB heat treatment standard remains at 160°F, some kilns using hot water might not meet all requirements for successful eradication of the pest.

Factors affecting HT include type of energy used, heating temperature and relative humidity factor, and air circulation. Because kiln drying might not raise the internal temperature of wood adequately to kill pests, Wang's lab experiments have included a mixture of HT methods that include moisture reduction as well. Dry heat compared with wet heat and green compared with seasoned firewood have affected the research that Wang and Bergman have already completed. Temperature monitors using thermocouples, data loggers that download into a computer, and paperless temperature humidity recorders can be effective ways of ensuring heat treatment is accomplished and properly recorded.

Terry Mace from the Division of Forestry, Wisconsin Department of Natural Resources, moderated. The workshop concluded with a drive to Green Thumb Farm 30 minutes north of Madison to see HT in action.

"The interaction between firewood companies and dealers was excellent," Mace said. "The finer points of both the rules and the frustrations were getting answered by APHIS. All the major firewood players were present, and the mechanics of heat treatment, as it was demonstrated, really drove home that research needs to come up with lower temperature standards combined with a longer time to help make the EAB heat treatment process more cost efficient."

A field demonstration will be held at Tomah, Wisconsin, sometime in the spring. A similar web-based workshop is being planned for later this year, and Wang also said new industry cooperators from Illinois and Indiana are being lined up for some out-of-state demonstrations. "While using the kiln as the standard for drying firewood is not new, making kiln-drying an effective process for meeting the heat treatment requirement to combat pests is," Wang said.

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## FPL RESEARCHER HONORED BY INTERNATIONAL ACADEMY

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Dr. Robert J. Ross, supervisory general research engineer at the Forest Products Laboratory, has been elected a fellow of the International Academy of Wood Science (IAWS). IAWS is a non-profit assembly of wood scientists, recognizing all fields of wood science with their associated technological domains, and securing a worldwide representation. This election is regarded as a very high honor in the wood science community and is a reflection of the contributions that Dr. Ross has made in his field.



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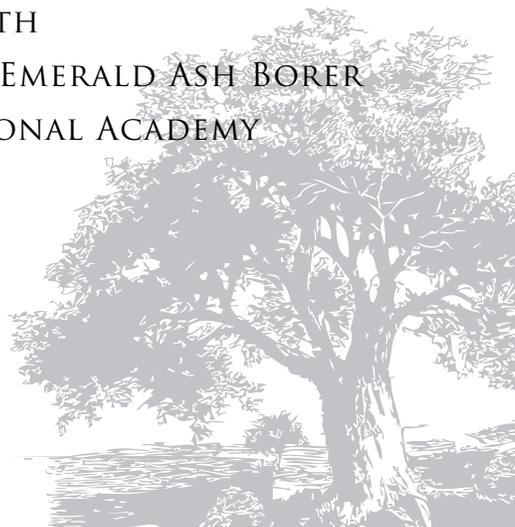
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