

Collaboration, research key to managing invasive species

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The spotted lanternfly, which recently was discovered for the first time in the United States in Berks County, poses a threat to many economically important species of trees and woody ornamentals in Pennsylvania. Credit: Holly Raguza, Pa. Department of Agriculture

Invasive species, such as the gypsy moth and emerald ash borer, have had devastating effects on Pennsylvania's forests, and the keys to combatting these threats are active management, collaboration and research, according to U.S. Rep. Glenn Thompson.

Thompson, whose 5th Congressional District encompasses 20 percent of Pennsylvania's land mass, made his remarks during a forum on invasive forest species that he sponsored Feb. 5 on Penn State's University Park campus. Presenters included experts from the University's College of Agricultural Sciences and from the Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry.

"In the 5th District, we have 513,000 acres of the Allegheny National Forest—490,000 are wooded—but the single largest ownership group is private owners, and this diversity of ownership creates a challenge," said Thompson, who chairs the House Agriculture Subcommittee on Conservation and Forestry. "These insects don't respect boundaries, so we need to bring together key stakeholders, such as federal and state agencies and private landowners, to collaborate."

Thompson noted that [active management](#) of invasive pests is essential to keeping forests healthy and resilient. "And it starts with good science," he said. "We need research to develop effective management practices to combat these threats. Applying the latest scientific knowledge goes a long way in preventing these species from spreading further and causing more destruction."

Richard Roush, dean of Penn State's College of Agricultural Sciences, gave an overview of problems caused by invasive insects, diseases and weeds. He pointed out that exotic invasive species—those that originate on another continent—tend to be most problematic, often because of the lack of predators and other natural controls that exist in the pests' original habitat. Examples include [emerald ash borer](#) and the recently

discovered spotted lanternfly.

"Over time, there have been various quarantine efforts designed to exclude such pests, but they often were underfunded or set aside in the interest of free-trade agreements," said Roush, an entomologist by training. "I don't believe many exotic pests are introduced by individual consumers or travelers bringing them in. It's more likely that commercial-scale transport leads to establishment.

"Some forms of [gypsy moth](#), for instance, are transported around the world as egg masses on packing material," he said. "So we need more research to develop simple methods to disinfect packing material and other exclusion strategies."

Once an invasive species has arrived, early detection can help limit the spread of the infestation, according to Tom Baker, Distinguished Professor of Entomology and Chemical Ecology, who talked about his research on emerald ash borer. "To take action against a disease or an insect pest, early detection is paramount," he said.

The emerald ash borer is a small beetle with stealth-like behavior patterns that make it extremely difficult to detect. Introduced to the United States from China in 2002, the pest has killed tens of millions of native ash trees in at least 24 states and two Canadian provinces and has been found in most counties in Pennsylvania.

With funding from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, Baker and his colleagues developed a trap that uses a synthetic visual decoy of a female emerald ash borer to capture males looking to mate.

"It may be too late to halt the spread of emerald ash borer, but the value of our research is we learned about this beetle's mating behavior," Baker

said. "In addition, we found out that European oak buprestid beetle—a close relative of the emerald ash borer that might at some point become an invasive species—behaves the same way. So if it comes here, we may be able to use this trap as an [early detection](#) tool for that pest as well."

Perhaps the newest introduction of an invasive species is the spotted lanternfly, which was found in Berks County, Pennsylvania, in the fall of 2014—its first detection in North America. This insect poses a potential threat to several important agricultural commodities in Pennsylvania. Homeowners also could suffer damage to high-value ornamentals in their landscape.

"In its native habitat in China, India, Japan and Vietnam, it attacks a variety of plants, including grape, apple, pine, stone fruit, tree of heaven and many others," said Greg Hoover, ornamental extension entomologist in the Department of Entomology.

Hoover is part of a team of Penn State researchers and extension specialists who have partnered with colleagues in the Pennsylvania Department of Agriculture and USDA-APHIS to contain and, they hope, eradicate the spotted lanternfly before it spreads to other parts of the state and country. Penn State researchers also received funding from the federal farm bill to study the pest.

"It's been a collaboration between federal and state regulatory agencies and Penn State as the state's land-grant institution," Hoover said. "There has been a huge educational outreach effort to inform the public about what to look for and how to submit specimens so they can be positively identified."

Don Eggen, chief of forest pest management in the Pennsylvania DCNR's Bureau of Forestry, described the state's gypsy moth suppression program and discussed efforts to manage hemlock wooly

adelgid and emerald ash borer.

"About 3.6 percent of Pennsylvania's forests are ash—a lot in the Northern Tier," he said. "There are 300 million ash trees in Pennsylvania, and 99 percent of them will die [due to emerald ash borer]. Researchers will be looking at the 1 percent that don't die for resistance to the pest."

Eggen said the bureau will treat some forest [ash trees](#) with a systemic pesticide to preserve them as a seed source for future breeding efforts. He said the state also works with communities to help them develop plans for managing [emerald ash](#) borer in their urban forests.

Thompson stressed that fighting [invasive species](#) is a never-ending battle. "We're always on the edge of a crisis with invasives," he said. "Every time we think we have one in the box, something else pops up."

"I strongly support the amazing research that's being done here at Penn State, as well as the great work and outreach done on the state level by DCNR. Partnerships and collaborative efforts are always essential when meeting challenges such as these."

Provided by Pennsylvania State University

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