Maine Board of Pesticides Control

Miscellaneous Pesticides Articles
September 2016

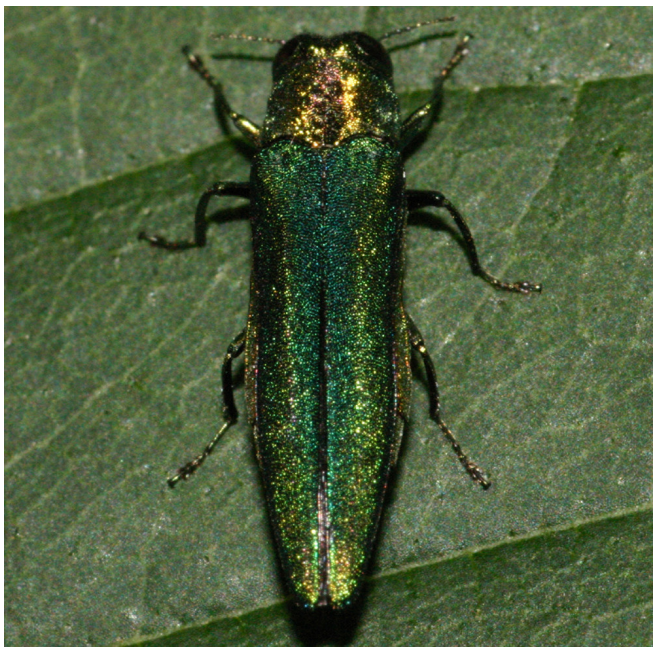
(submitted by individuals)

Chamberlain, Anne

From: jody spear <>
Sent: Wednesday, August 31, 2016 3:37 PM
To: Chamberlain, Anne
Subject: for next board meeting packet (misc.) :'Femme fatale' emerald ash borer decoy lures, kills males

Check out this article from the Penn State news site:
http://news.psu.edu/story/326413/2014/09/15/research/femme-fatale-emerald-ash-borer-decoy-lures-kills-males

PennState



An emerald ash borer rests on a leaf.

Image: Jonathan Lelito/BASF Corporation

'Femme fatale' emerald ash borer decoy lures, kills males

Researchers target bug that has killed tens of millions of ash trees

Sara LaJeunesse
September 15, 2014

UNIVERSITY PARK, Pa. -- An international team of researchers has designed decoys that mimic female emerald ash borer beetles and successfully entice male emerald ash borers to land on them in an attempt to mate, only to be electrocuted and killed by high-voltage current.

"Our new decoy and electrocution process may be useful in managing what the U.S. Department of Agriculture Forest Service claims to be the most destructive forest pest ever seen in North America," said Michael Domingue, postdoctoral fellow in entomology, Penn State.

According to the Forest Service, the emerald ash borer was introduced to the United States from China in 2002. Since then, it has spread throughout 24 states and two Canadian provinces, and killed tens of millions of otherwise healthy native ash trees.

"Early detection of the pest in traps such as ours can help in coordinating management strategies to slow its spread and minimize its impact," said Domingue.

The researchers -- including entomologists and engineers at Penn State, the Hungarian Academy of Sciences, the Forest Research Institute in Matrafured, Hungary, and the USDA -- created the decoys using a bioreplication process with nanoscale fidelity.

"Specifically, we coated a dead female beetle with a vapor of nickel, and used the 'nickelized' shell to fabricate two matching molds in the shape of a resting beetle," said Akhlesh Lakhtakia, Charles Godfrey Binder professor of engineering science and mechanics, Penn State. "Pressing a structurally colored plastic sheet between the two molds while simultaneously applying heat, we cast numerous replicas or decoys. The finished bioreplicated decoys retained the surface texture of the beetle at the nanoscale.

Additionally, we painted some decoys a metallic green."

The Penn State engineers also created decoys using a 3D-printing process. In this method, they molded plastic into the size and shape of emerald ash borers, but did not attempt to duplicate the surface texture of the insects.

The researchers pinned the bioreplicated and 3D-printed decoys, as well as dead female emerald ash borers, onto leaves to see which of them best attracted wild males.

Image: Michael Domingue/Penn State

Next, the entomology researchers pinned the bioreplicated and 3D-printed decoys, as well as dead female emerald ash borers, onto leaves in forests in Hungary to see which of them best attracted wild males. In the same forests, the team also placed traps configured with decoys bearing a 4,000-volt charge to electrocute and trap males as they landed on the decoy females.

The results appeared Sept. 15 in the Proceedings of the National Academy of Sciences.

The scientists found that both types of synthetic decoys, as well as the dead pinned females, elicited initial flights by males toward them. Males nearly always chose to land on the dead females and the more realistic bioreplicated decoys. However, while the males initially flew toward the simpler 3D-printed decoys, they did not land on them. Males would normally quickly leave the bioreplicated decoys after they touched them. Yet, that brief contact was enough for them to become instantly stunned and captured by the trap if the voltage was applied to the decoys.

According to Domingue, the light-scattering properties of the beetle's shell -- which the team experimentally demonstrated using a white laser -- made the nano-bioreplicated decoys more lifelike and, therefore, more attractive to males than the non-textured 3-D-printed decoy.

"We learned that not only do color and shape of a resting female beetle play a role in attracting males to a mate, but also the fine-scale texture of the visible surface is important," said Domingue. "Small bumps and spines on the outer surface of their wings and heads that aren't visible to the human eye scatter light in a distinctive pattern. Beetles appear to be able to recognize this feature of the decoys and are strongly attracted to it. This insight may at least partially explain how mate-seeking males can easily detect and approach green-colored females cryptically resting on green leaves. Ultimately, we have gained new insights into how to manipulate the behavior of emerald ash borers and similar pests in ways that can help to trap them and monitor where they might be doing damage."

According to Thomas C. Baker, distinguished professor of entomology, Penn State, the findings were possible only because of the multidisciplinary makeup of the team.

"I was able to find colleagues whose intellects, expertise, and enthusiasm matched the tasks at hand, thus enabling us to figure out how these destructive beetles find each other to mate and how we can exploit this behavior in order to help APHIS meet its goals of early detection and mitigation of invasive pests," he said.

The researchers said their next step will be to further improve the traps to maximize their potential as part of an early detection tool for emerald ash borers.

"Our laboratory has ongoing research with the USDA Animal Plant Health Inspection Service into remote-reporting, Internet-based technologies, and we will be working to couple this research with our ash-borer detection technique so that activity of the pest can be reported and assessed immediately by APHIS personnel, rather than waiting days or weeks until a trap might usually be checked," said Baker.

In addition, the team has been investigating the use of the decoys to attract other insect species, some of which are aggressive feeders on oak trees in central Europe and might threaten North American oaks in urban and forest landscapes much as the emerald ash borer destroyed ash trees.

"We have made progress in our research so far in Hungary these past few summers, and it looks like our decoys can be refined to attract and detect these other, new and potentially invasive pest species effectively," said Domingue.

Other authors on the paper include Drew Pulsifer, recent graduate student in engineering science and mechanics; Loyal Hall, graduate student in entomology; John Badding, professor of chemistry; Jesse Bischof, graduate student in chemistry; Raul Martin-Palma, adjunct professor of materials science and engineering; and Missy Hazen, research technologist, Huck Institutes of the Life Sciences; all of Penn State; and Zoltan Imrei of the Hungarian Academy of Sciences, Gergely Janik of the Forest Research Institute in Matrafured, Hungary, Victor Mastro of the USDA.

The USDA and the Hungarian Academy of Sciences supported this research.

CONTACTS:

A'ndrea Elyse Messer, aem1@psu.edu
Work Phone: 814-865-9481

Last Updated October 14, 2014

Chamberlain, Anne

From: jody spear <>
Sent: Wednesday, August 31, 2016 3:35 PM
To: Chamberlain, Anne
Subject: Fwd: ionization, rather than toxic chemicals, for weed and insect control

Hi Anne,

I sent this to go in the "Misc." section of the board's packet for the last meeting, and it wasn't included. Please post it for the Sept. meeting. Another is on the way as well.

I have a question about comments Curtis Bohlen made about sales data analysis on Aug. 19. Assuming minutes are not recorded, is it possible to get those remarks verbatim now, before the minutes are released?

Thanks,
Jody

---------- Forwarded message ----------
From: **jody spear** <>
Date: Mon, Aug 15, 2016 at 5:00 PM
Subject: ionization, rather than toxic chemicals, for weed and insect control
To: Henry Jennings <henry.jennings@maine.gov>

---------- Forwarded message ----------
From: **jody spear** <donotreply@bangordailynews.com>
Date: Mon, Aug 15, 2016 at 4:59 PM
Subject: Recommended Article By jody spear: Vineyard, orchard rising from old County potato farm
To: jody spear <>

Hi **jody spear**,
Your friend, **jody spear**, has recommended this article entitled '**Vineyard, orchard rising from old County potato farm**' to you.

Here is his/her remark:
N/A

Vineyard, orchard rising from old County potato farm
Posted By Anthony Brino On August 8, 2016 (6:03 am) In Aroostook, Business, Homestead, News

On a 60-acre family farm in Fort Fairfield that was left fallow for four decades, Jeff and Judy Armstrong are tending to a growing fruit farm, experimenting with wine making and also using some unique pest control practices.

Over 30 acres on their Currier Road property passed on by Jeff's father, the Armstrongs have 6,000 grape vines and 1,600 fruit trees, mostly apples, comprising a vineyard and orchard just getting started.

“The average age of the trees is four years. This year, for the first real time, our apples are starting to produce fruit,” said Jeff Armstrong. The couple also started making wine from grape varieties like Frontenac and Valiant, and are thinking about selling it within the next few years, which would make this Aroostook County’s second commercial winery and the only one to use grapes.

Richard and Jean Sloat, who run a craft and embroidery shop in Houlton, started Hidden Spring Winery in Hodgdon last fall, making fruit wines from local wild and cultivated fruits like choke cherry, elderberry, rhubarb, apple and strawberry, as well as grape wines from imported juice.

They are not yet distributing their wines, but sell bottles and servings from a tasting room at their farmstead.

The wines the Armstrongs are working on are similar to many originating from California’s Napa Valley, although with some “unique characteristics” thanks to the colder climate. “We get frost in September and October, and warm afternoons, and it sweetens up the grapes.”

The Armstrongs started planting the vineyard and orchard in 2009, almost 20 years after they moved back to their native Fort Fairfield from Portland and settled at the property of Jeff’s family farm. Jeff left the town in the late 1970s for college and to pursue a career in engineering, around the same time his father gave up potato farming and became a plumber. The farm, like other fallow land in the area, grew into a young forest.

“It took about 10 years to get that cleared, and then I thought maybe we should do something with the land. We had to do something other than mow the grass.”

Jeff’s brother suggested apples, as other apple orchards in Caribou and Presque Isle were growing at the time, and he got the idea for the grapes from the Bible. “One day I was reading the parable of the vine and the branches, and I was inspired by that: What about grapes?”

They started researching and talked with a now deceased woman in Washburn who tended a small vineyard with her husband, and then visited Lincoln Peak Vineyard in New Haven, Vermont, where the owners “were 12 years ahead and doing well.”

So far, so good with their vineyard and orchards, too, Armstrong said, adding that he hopes local farmers and gardeners will give grapes in particular a try. The Armstrongs sell many of the same cold-hardy varieties of vines and trees they’re growing, such as the seedless variety Somerset, along with honey, fresh vegetables and other goods, from a shop inside Jeff’s business, Armstrong Engineering, in Fort Fairfield.

While the Armstrongs surprised family and neighbors by planting 15 acres of grapes in potato country, they’ve also taken a highly unconventional approach to common fungal diseases of the grapes and fruits, with a treatment known as ionized water.

“Basically, the machine puts a positive electrical charge in the water, and that electrical charge causes the spore to be destroyed” by creating an acidic environment for the fungus, Armstrong said.

Like potato growers, conventional vineyards and orchards normally rely on a number of synthetic fungicides to control blights, mildews and other diseases, and ionized water is virtually unheard of in the United States. Armstrong said he discovered that farmers in other countries are using ionized water as fungal treatment in greenhouses, and he found a Canadian business that is testing ionizer machines that could be developed for the agricultural market.

“It seems almost too good to be true,” said Judy Armstrong. Yet they say the treatment has allowed them to control downy mildew, one of the worst grape diseases, with a spray that’s harmless to humans.

They also use ionized water on the potatoes they sell, although they normally avoid major potato pests because they harvest most of the spuds early as new potatoes.

“Ionized water would be great for late blight,” Jeff Armstrong said. “I roughly determined that [potato growers] would save 50 percent on chemicals in a year.” He added that he thinks it could also help control the Colorado Potato Beetle.

Although their farm is not certified organic, the Armstrongs said they largely follow organic practices and avoid synthetic and toxic pesticides. To control insects, for instance, they spray a water and baking soda mixture.

As their production starts growing, the Armstrongs are still figuring out what they will do with the fruits, between wines, ciders, jams, pick-your-own and fresh fruit, but they’re looking forward to passing the farm on to their kids and grandkids, as Jeff Armstrong’s family did for four generations.

The farm already has about 50 old apple trees, some dating back more than a century, including the Yellow Dutchess planted by Armstrong’s great-grandfather.

“An apple tree will last a long time and so will a grape vine,” he said.

Article taken from Bangor Daily News - http://bangordailynews.com
URL to article: http://bangordailynews.com/2016/08/08/news/aroostook/vineyard-orchard-rising-from-old-county-potato-farm/