Plant Protection Today: USDA’s Snail Study Benefits From Collective Efforts

Cover Photo: Each morning, teams recorded the number of snails on paperboard traps (in the foreground) which they compared to commercial trap snail counts. Pictured left to right; Michigan Department of Agriculture and Rural Development (MDARD) Plant Health Inspector (PHI) Connor Sturr, USDA Biological Science Lab Technicians Jeffrey Bartman and Danial Hannon, MDARD PHI Nick Zoller and Oregon State University's Malacologist Rory McDonnell.

Scientists' Survey and Control Methods Target Invasive Land Snails

By Sharon Lucik

For more than 2 years, Amy Roda, Supervisory Entomologist at USDA's Treatment and Inspection Methods Laboratory in Miami, FL, and Oregon State University's Malacologist Rory McDonnell have been researching best management practices to detect and control invasive land snails. Last month the two scientists met in Michigan to test an inexpensive and simple new way to survey for snails, and evaluate treatments to manage the pest.

"I made one phone call to USDA's State Plant Health Director Craig Kellogg, and that's all it took," said Roda. "The staff leaned in and made all of the arrangements. They scouted and secured locations, recruited volunteers, and transported our tools and supplies. They did all the heavy lifting so Rory and I could conduct additional research."

Land snails live almost everywhere in the world except Antarctica. In the United States, these hitchhiking pests are frequently intercepted on and inside shipping containers from overseas. According to Roda, invasive land snails are difficult because of their very nature. They can attach themselves to almost anything including shipping containers and can survive for months until they fall off and become active. Railyards, where shipping containers are stored, staged, and loaded onto trucks and trains, are fertile grounds for these invasive pests to hitch a ride.

Amy Roda and Rory McDonnell's research targets invasive snails like Acusta spp (left) and the Eastern Heath snail (right).

In 2001, USDA’s staff in Michigan recorded the first U.S. detection of the eastern heath snail (EHS). And in 2021, they detected an Acusta species—another invasive snail and first U.S. record. Surprisingly, significant populations of both snails were detected in a Michigan Kent County Park property. That made it an optimal location for Roda and McDonnell’s research.

“We had everything we needed in one location, so it was pretty awesome,” Roda explained. “Over the 2-week field study, we evaluated 5 pesticides and the longevity of the fermenting bread dough food bait. We also tested cucumber and fermenting dough—known snail attractants—and tested and compared a simple, low-cost survey tool constructed out of paper board with a commercial snail trap.”

The group found that all pesticides were effective in killing the snails. The metaldehyde pesticides provided immediate control, and the less toxic ones were effective several days after application. The fermenting dough lure was found to be attractive for 2 weeks, and the combination of the fermenting dough lure and the paper board was very effective.

The study’s scope and accomplishments were made possible due to assistance from USDA, Michigan Department of Agriculture and Rural Development, and Kent County Parks and Recreation employees. “What we learned so far shows promise,” Roda said. “We will continue to develop these methods and eventually integrate them into best management practices to help control these snails and other invasive snails if they are detected in the United States.”

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