

You Ain't From Around Here! Exotic Invasive of the Quarter: Spotted Lanternfly (*Lycorma delicatula*)

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Although I wasn't planning on continuing with species which aren't currently in Virginia, I came across this little beauty in my reading and couldn't resist. So, here is the story of a lovely, but destructive, leafhopper called the spotted lanternfly (*Lycorma delicatula*) which has been found in Pennsylvania.

First, some etymology: While I wasn't able to find *Lycorma* in the Latin dictionary, I was able to find two roots, *lyc* and *lyco*. *Lyc* means lamp, which seems appropriate because this insect was given the name lanternfly in part because of a mistaken belief that its head was illuminated. However, *lyco*, the root of *lycopersicum*, meaning tomato, is also appropriate because of the red coloration on the hind wings of the adult leafhopper. And, once you look at color photos of this species, you'll understand that *delicatula*, meaning luxurious, sumptuous, and pretty, is a quite reasonable name.

Now some entomology:

The spotted lanternfly, a native to China and Vietnam, was first detected in five townships in SE Pennsylvania in 2014. This set off a rapid response the likes of which I'm not sure we've ever seen in the US. Within six weeks of identification, the five townships were quarantined, meaning no infected materials could be removed from the quarantined area. Within five months, Pennsylvania had received \$1.5 million from the Farm Bill to implement detection, control, and research projects to stop this insect.

These insect are not flies; they are not moths; they are leafhoppers. Leafhoppers are members of the family *Cicadellidae*, plant feeders that use piercing and sucking mouthparts to draw sap from grass, shrubs, or trees. They are not strong fliers, but they are strong jumpers. Their hind legs are modified for jumping and carrying pheromones. When the insects are immature, they are easily knocked off plants. They take this opportunity to choose more-preferred species and disseminate from their siblings. This movement strategy is called climb and fall.

Egg masses are laid in the late summer and early fall on smooth surfaces. The preferred surface is tree of heaven bark, but they will lay on any smooth-barked tree, rocks, and outdoor household items such as lawn furniture. Human movement of these last items, when they have egg masses on them, has caused the spread of other insects, such as the gypsy moth caterpillar. So educating homeowners to look for these egg masses will be critical to helping prevent human-caused spread of the spotted lanternfly. The spotted lanternfly overwinters in these egg masses and hatches out in the spring.

Damage

Why this massive, instantaneous effort? Because the spotted lanternfly, in spite of its great beauty, is one bad leafhopper.

All life stages of the spotted lanternfly feed on the phloem (the vascular tissue in plants), consuming massive amounts of sap. They also excrete substantial amounts of sugary liquid, which harbors mold. Affected trees will have weeping wounds of sap on their bark, resulting in accretions of honeydew around their bases. The bases of the trees and the surrounding soil turn black from sooty mold fungal growth. This invites not only disease, but also bees, wasps, hornets and ants. In the native range of the spotted lanternfly, these impacts do not normally kill host plants; absence of natural predators outside their native range, however, can lead to over-infestation and cause disease and death in plants.

Now when I tell you the food of choice for these insects is tree of heaven, you might think, "Wait, what? Well then doesn't that make them a beneficial insect?" Unfortunately, no. Because they feed on many other species as well. Affected species include apples, plums, cherries, grapes, peaches, nectarines, apricots, almonds, pines, oaks, walnuts, poplars, willows, maples, and sycamores. As such, these insects could have a significant negative impact both in the forestry and viticulture industries in Virginia.

How to identify

There are six stages in the spotted lanternfly's lifecycle. Once the eggs hatch, the insects go through four instars (nymph stages) before undergoing a partial metamorphosis into their adult form. As instars 1-3, the nymphs are black with white spots and wingless and prefer feeding on smaller plants. In the 4th instar, red mottling appears under the white spots and the nymphs begin moving to larger trees and grapes, where they will continue to feed as adults.

The adults are really quite lovely. Their front wings are gray with black spots except for their edges that have black rectangles outlined in gray. Their hind wings are red, black, and white. Spotted lanternfly legs and heads are black and their abdomens are yellow with broad black bands. An adult is typically 1" long and 1.5" wide.

Fresh egg masses, with 30-50 eggs in each, can be found on smooth surfaces, both living and non-living. Fresh egg masses have a gray, waxy, mud-like coating. Hatched egg masses look like brownish seed-like deposits in four to seven 1" long columns.

How to Control?

The effectiveness of Pennsylvania's monitoring and control efforts remains to be determined. As of December 2015, volunteers have scraped off 603,645 egg masses and trapped 174,390 insects using sticky brown tree bands. However, the quarantined area has expanded from a few townships in one county to four counties, in just one year. This could be a result of the insects actually spreading (or being spread), or from the outreach efforts

resulting in a greater awareness. Most likely it is some combination of both. Since this insect is so new to the US, research to understand and control the spotted lanternfly is in its early stages. So right now, the focus is on stopping the spread by educating landowners about this threat.

Keep a lookout for these bad leafhoppers – here’s hoping you DON’T see any. But, if you do, please report the sighting to Pennsylvania’s Bad Bug Hotline; badbug@pa.gov; 866/253-7189.

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An approximation of the annual lifecycle of the spotted lanternfly. Photos by: Holly Raguza, United States (adult and egg mass), and Lawrence Barringer, Pennsylvania Department of Agriculture (all others). Life cycle graphic by Jennifer Gagnon, Virginia Tech, (based on observations in China).