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Spotted Lanternfly: Our Latest Threat

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INTRODUCTION

In September 2014, a Pennsylvania Game commissioner educator noticed damage to the tree-of-heaven (*Ailanthus altissima*), along with an insect he did not recognize, on his property in eastern Berks County, Pennsylvania. The landowner decided to report this finding to the Pennsylvania Department of Agriculture (PDA) Entomology Program which responded with an immediate site visit. The PDA entomologists were able to collect several hundred specimens which were identified as *Lycorma delicatula* (White), a new pest in Pennsylvania and North America. (Figure 1).

The spotted lanternfly, *Lycorma delicatula*, is a planthopper native to China, India, Vietnam, and introduced to Korea where it has become a major pest. This insect has the potential to greatly impact the grape, hops, and logging industries. When it was first detected in South Korea in 2006 it rapidly spread throughout the country and was reported to be a pest of grapes and peaches. Studies also indicated that the planthopper made use of over 65 different types of plants. In Pennsylvania the spotted lanternfly has been recorded feeding on many different plants including *Ailanthus*, *Salix*, *Vitis*, *Acer*, *Prunus*, *Quercus*, and *Juglans*, along with a range of vines, ornamentals, and garden plants. Adult *Lycorma* narrow their host range to *A. altissima*, or tree-of-heaven, before mating and laying eggs.

Figure 1. Adult spotted lanternfly, *Lycorma delicatula*

In Pennsylvania spotted lanternfly completes one generation per year. It begins laying eggs in the fall of the year in clumps of 30–50 eggs which are covered in a foam-covered mass (Figure 2). Egg masses are laid on trees and many other smooth surfaces and are often hidden. Many eggs are laid on surfaces like cinder blocks, rocks, rusty barrels, picnic tables, and other outdoor items. As eggs masses age they begin to look more like dried clay or mud. Egg masses can be removed by scraping the mass off a surface they are attached to and placing them in rubbing alcohol or hand sanitizer.

Figure 2. Spotted lanternfly egg mass.

Starting in mid to late May, the first immature stages begin to hatch from the eggs. The immature stages of the spotted lanternfly will molt three times, getting progressively larger. Each life stage immediately after molting is referred to as an instar. The first three instars are black with white spots can be found from mid-May through August. During these stages the insects crawl up and down host trees and plants each day to feed and to avoid predators. Because the insects move up and down each day, large sticky cards have been used to trap them as they are traveling. This involves wrapping the trees with a band of sticky paper, which catches the insects as they crawl.

Figure 3. Immature spotted lanternflies.

The last nymphal stage of the spotted lanternfly is not just the largest, it is also the most colorful. Fourth instar nymphs start to appear in early July and are red and black with white spots. Starting with the later instar nymphs the spotted lanternfly starts moving from other hosts and begins to concentrate on Tree-of-Heaven almost exclusively.

Adult spotted lanternfly feed for several weeks on tree-of-heaven prior to mating and laying the next generation of eggs. Because they strongly prefer tree-of-heaven, removing most of these invasive trees on infested properties serves to concentrate the spotted lanternfly population so it can be more easily and safely treated with pesticides. Most tree-of-heaven are removed and treated with herbicide to prevent regrowth. A few select males are left standing as “trap trees” which are then treated with a systemic pesticide which kills the spotted lanternfly that have moved into feed on the remaining trees. The pests have little choice but to feed on these treated trees and are eliminated from the population. This has worked well in

reducing populations in heavily infested areas but requires a lot of work.

Damage from the spotted lanternfly comes primarily from repeated feeding especially on grapes, hops, and plants in orchards, nurseries and the hardwood industry. Feeding on plant juices results in excretion of a sweet, sticky substance known as honeydew and accumulation of dripping honeydew from heavily infested areas can result in the growth of sooty mold on surfaces (Figure 4). In 2017, heavy feeding was seen on walnut, red oak, maple and hickory trees which resulted in flagging and dieback.

Figure 4. Honeydew and sooty mold.

Currently a quarantine is in place to stop the movement of this pest to new areas and to slow its spread within the quarantine area. The quarantine restricts the movement of the pest and products that may have egg masses present. The quarantine currently covers thirteen counties including Berks, Bucks, Carbon, Chester, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Philadelphia, and Schuylkill, and encompasses 6928 square miles. Surveys are currently underway to determine how widespread this pest is in Southeastern Pennsylvania and to ensure the spotted lanternfly is not present in other parts of the commonwealth (Figure 5). Reports from the public aid the Pennsylvania Department of Agriculture in new detections. While the spotted lanternfly can walk, jump, or fly short distances, many of these detections are single specimens whose spread appears to be linked to hitchhiking.

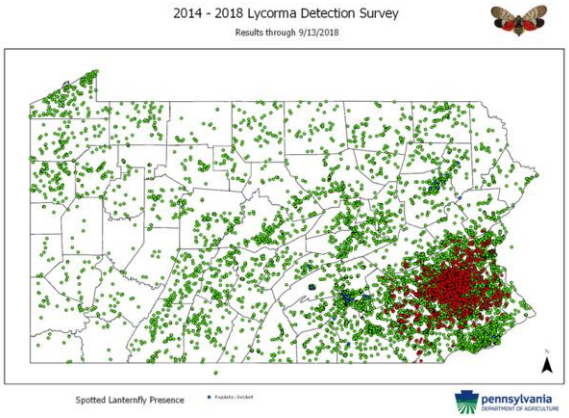

Figure 5. 2014-2018 *Lycoma* detection survey.

The spotted lanternfly program relies on cooperation between local, state, and federal agencies and organizations, along with citizens living in and out of the quarantine area. Local officials and state agencies have been leading the organizational charge and have created a work plan for Pennsylvania.

Currently extension, universities, the USDA and others are researching new and effective ways to deal with this pest. Some work being researched is to the identify the host range of the pest, its impact on grapes, the attractiveness of certain plant volatiles for use in trapping programs, and to analyze its DNA.

The spotted lanternfly is a significant threat to Pennsylvania's vineyard, orchard, nursery, and forest industries. It can also damage landscapes and make recreation unpleasant. Education and outreach are key to future control of this quickly spreading invasive pest. Be informed, aware of your surroundings and report any unusual observations to authorities.

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