



Spotted Lanternfly

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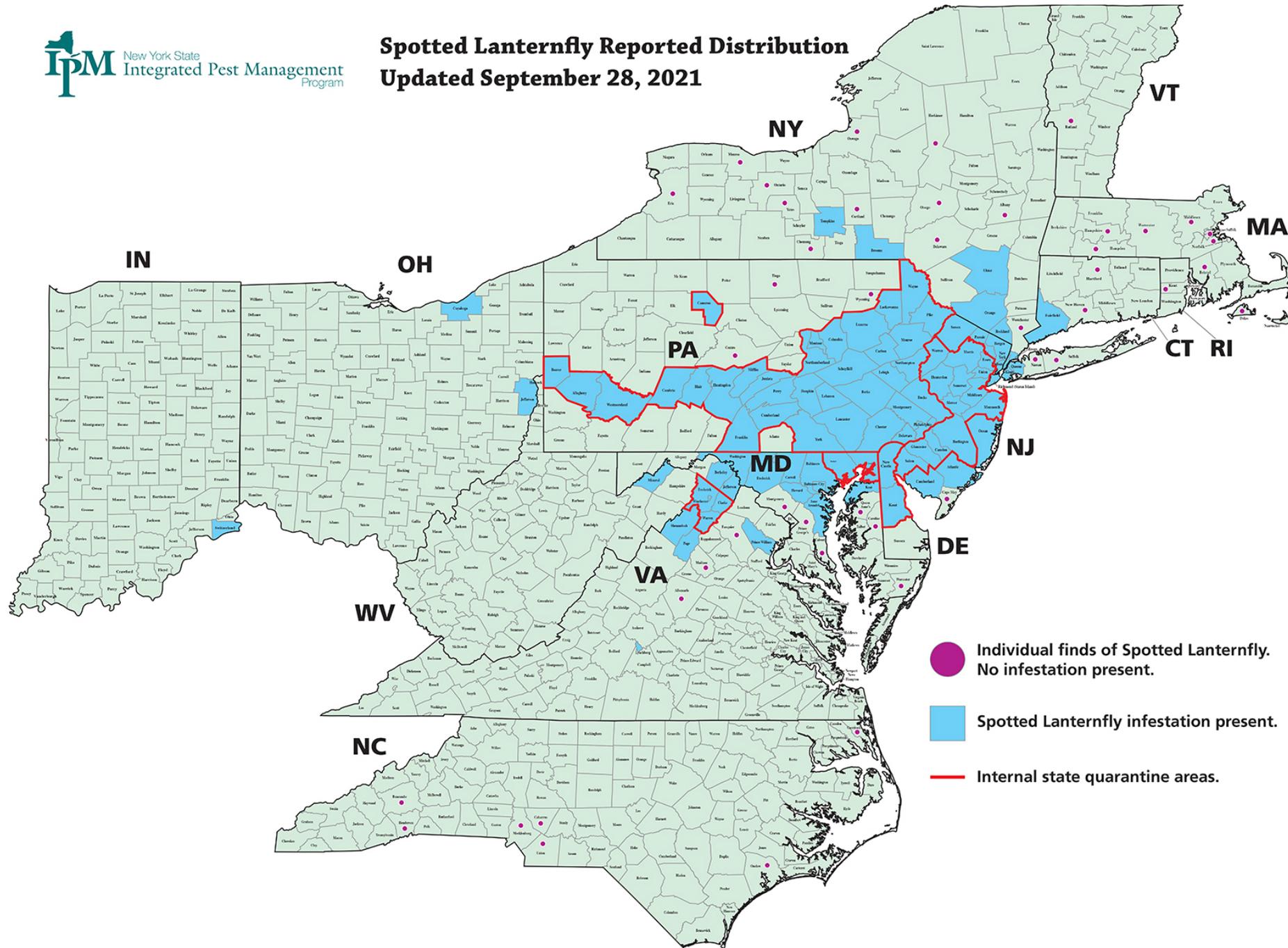
Spotted Lanternfly

Lycorma delicatula

- Native to China, Taiwan, and Vietnam; has invaded Korea (2004) and Japan (2009)
- First discovered in PA in Sept 2014
- Probably arrived to the U.S. as eggs on shipments of stone from China
- Now confirmed in 14 states; intercepted in CA and OR



Spotted Lanternfly Reported Distribution Updated September 28, 2021



Host Plants

- Feeds on > 100 plant species, > 20 plant families
 - This list is likely to grow
 - ~200 hosts for egg laying
- Hardwood trees, ornamentals, fruit trees, grapevines, hops
- Strong preference for *Ailanthus altissima* (tree-of-heaven)
 - Contains compounds that may help protect the lanternfly from predators



Feeding

- Swarm feeders; can be found in small groups
- Use a piercing-sucking mouthpart to feed on phloem (sap)
- Their honeydew coats plant surfaces and attracts pests (wasps, sooty mold)
- Highly infested plants ooze sap and wilt; leaf curling, dieback
- Decline in crop quality and yield







14x more
insecticide
sprays in
affected
vineyards!





Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org



Kenneth R. Law, USDA APHIS PPQ, Bugwood.org



Emelie Swackhamer, Penn State University, Bugwood.org

Spotted lanternfly is a nuisance pest



Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org



NYSIPM Staff



Barbara Bower, Homeowner

Overwinter as eggs

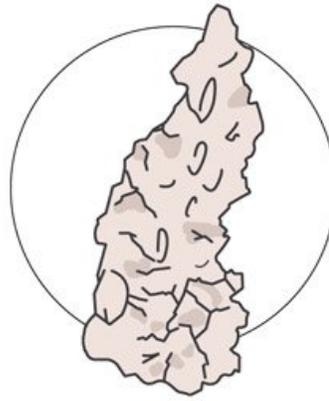
Females produce 1-2 egg masses (30-100 eggs)

One generation per year

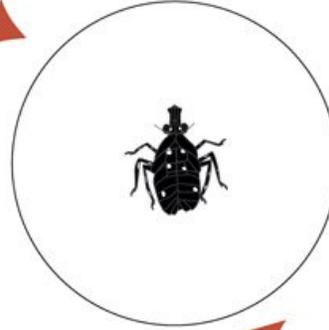
EGG LAYING
September — December



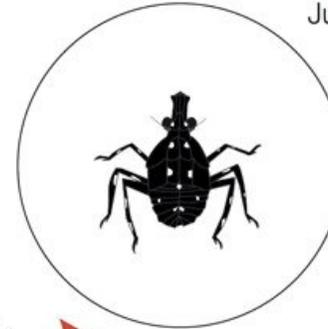
EGGS
September — June



HATCH AND FIRST INSTAR
May — June



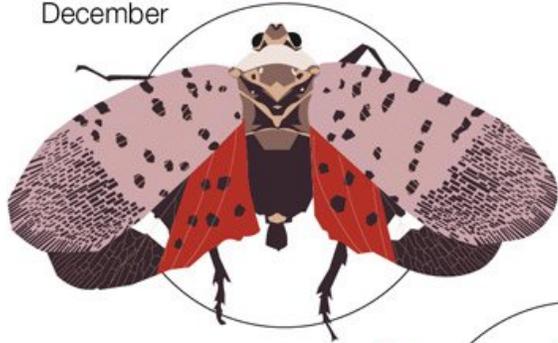
SECOND INSTAR
June — July



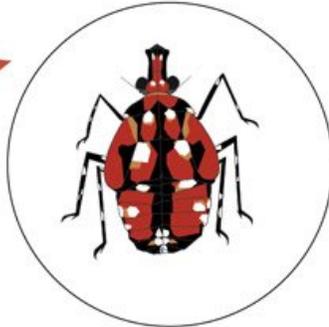
Many hosts

SPOTTED LANTERNFLY LIFE CYCLE

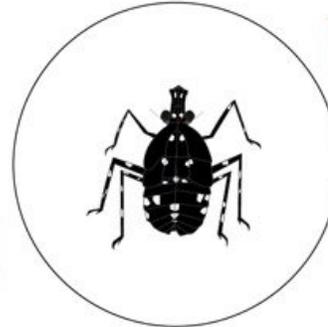
ADULTS
July — December



FOURTH INSTAR
July — September



THIRD INSTAR
June — July



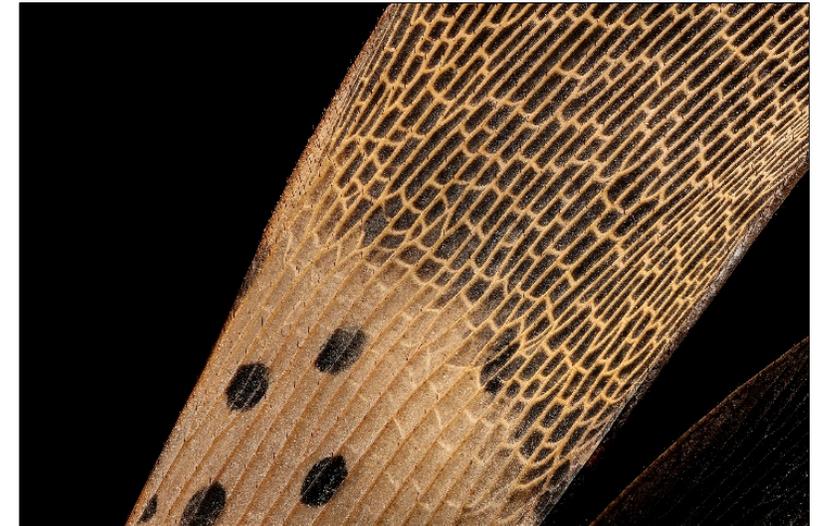
Few hosts

Identification - Adults

- Males are $\frac{5}{8}$ inch long; females are 1 inch long
- Head and legs are black
- Abdomen is yellow with broad black bands
- Forewings are gray with black spots, and have a brick-and-mortar pattern on the outer tips
- Hindwings are black and white anteriorly, and red and black posteriorly



Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org



USGS Bee Inventory and Monitoring Lab from Beltsville, Maryland, USA [Public domain]



Identification - Nymphs

- 1st-3rd instars are black with white spots
- $\frac{1}{8}$ to $\frac{3}{4}$ inch long



Ekkehard Wachmann

- 4th instar is red and black with white spots
- $\frac{3}{4}$ inch long



Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Be aware of lookalikes



Elizabeth Benton, University of Georgia, Bugwood.org



Herb Pilcher, USDA Agricultural Research Service, Bugwood.org



Whitney Cranshaw, Colorado State University, Bugwood.org

Eggs masses contain 30-50 individual eggs



Emelie Swackhamer, Penn State University, Bugwood.org



Emelie Swackhamer, Penn State University, Bugwood.org





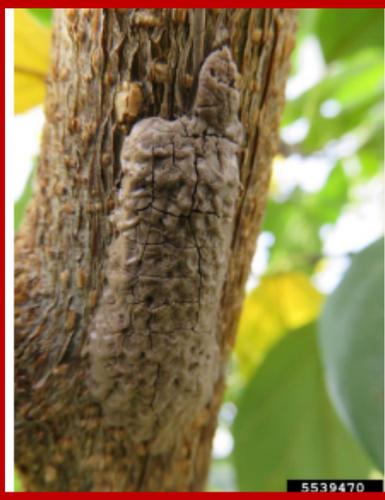




Possible Spotted Lanternfly Egg Mass Look-alikes in Virginia

Theresa Dellinger and Eric Day, Dept. of Entomology, Virginia Tech

Egg masses of the spotted lanternfly, *Lycorma delicatula* (White), are usually covered with a smooth tan to gray colored coating when fresh. This coating may crack and fall off with age, exposing eggs laid in vertical rows underneath. Some egg masses are laid with only some or no covering at all. Here are a few other insect egg masses found in Virginia to help you recognize those of the spotted lanternfly. Sizes not to scale.



Spotted lanternfly egg mass
Kenneth R. Law, USDA APHIS PPQ,
Bugwood.org



Spotted lanternfly eggs
without covering. Kenneth R. Law,
USDA APHIS PPQ, Bugwood.org



Gypsy moth egg masses
covered with brown hairs.
Karla Salp, WA State Dept. of Ag,
Bugwood.org



Chinese mantis egg case
Whitney
Cranshaw, CO State Univ., Bugwood.org



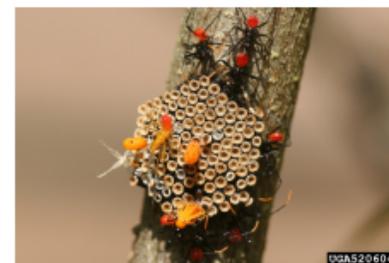
Eastern tent caterpillar eggs
Whitney
Cranshaw, CO State Univ., Bugwood.org



Cankerworm eggs PA Dept. of
Conservation and Natural Resources -
Forestry, Bugwood.org



Lichen on bark
Eric Day, Virginia Tech



Wheel bug eggs and nymphs
Johnny N. Dell, Bugwood.org

Pathways of Spread

- SLF can move 3-4 miles a year on their own
- Hitchhikers at all life stages; adults and egg masses are the most common
- Pathways include landscaping stones, vehicles, railroad corridors, plant materials (firewood, nursery stock), etc



Monitoring for SLF

- SLF, especially early instars, move up and down the host plant on a daily basis as they feed
- Sticky bands deployed on tree trunks, sometimes paired with methyl salicylate lure
- Drawbacks
 - Can become saturated
 - Adults can avoid the sticky bands or break through the adhesive
 - High numbers of non-target captures





How to Build a New Style Spotted Lanternfly Circle Trap

It is almost time to use traps to protect your trees from spotted lanternflies. Get ready now so you can trap lots of spotted lanternflies safely.

Many people in SLF infested areas have been using sticky bands wrapped around trees to capture nymphs. While this method can successfully capture many SLF nymphs it can also unfortunately occasionally capture birds and other creatures. If you are planning to use sticky bands this year, you should build a raised guard of wire or screening around the band to prevent other creatures from getting stuck on them. Penn State Extension has a [short video](#) that shows how to properly use sticky bands.

Recent research has shown that an entirely different kind of type of trap is also very effective and can dramatically reduce the chances of capturing other creatures. This new style trap is made of plastic-coated insect screening and does not use any sticky material at all. It is basically a tunnel that SLFs walk into. When they move upward in the trap, they end up in a dead-end collection container where they die. Currently, you can purchase this type of trap made specifically for SLF from one commercial source. Some people have been modifying similar commercially available traps designed for other insects to catch SLF. Other people have been making their own SLF traps from scratch.

This type of trap was originally designed to collect pecan weevils that also climb up the trunks of trees. They can be purchased commercially (search for circle weevil traps.) Pecan weevils are quite small, and the design of the pecan weevil trap can be modified to include a larger collection container to allow capture of high numbers of SLF. The collection container can be a repurposed item such as a clean peanut butter jar or even a sturdy plastic bag. A sturdy plastic bag that can be removed and replaced with a fresh one is a good way to go because you do not have to empty a container of rotting, stinky, dead insects. It also allows you to replace the old, dirty bag with a clean bag that will transmit daylight. SLF tend to move upward towards the light. Additionally, bags will begin to tip over as they get full, moving captured insects away from the entry port, which keeps the area free so more SLF can crawl in.

Some creative people have built similar traps and have devised a range of methods that work. Building these traps is a good project for anyone who wants to destroy SLF, save money by using materials they might already have on hand and practice their engineering skills.



Circle trap secured to a tree. Photo: Emelie Swackhamer, Penn State

The spotted lanternfly (SLF) is an invasive insect that feeds on grapevines and trees. There are a variety of options for SLF management, but one way to kill a lot of SLF without using insecticides is to trap them. The immature lanternflies (called nymphs) are often blown out of the canopy of the trees where they are feeding. Nymphs then walk to the trunk of trees and climb back up to start feeding again. We can take advantage of this predictable behavior of the nymphs by using traps to catch them as they climb up trees.



PennState Extension



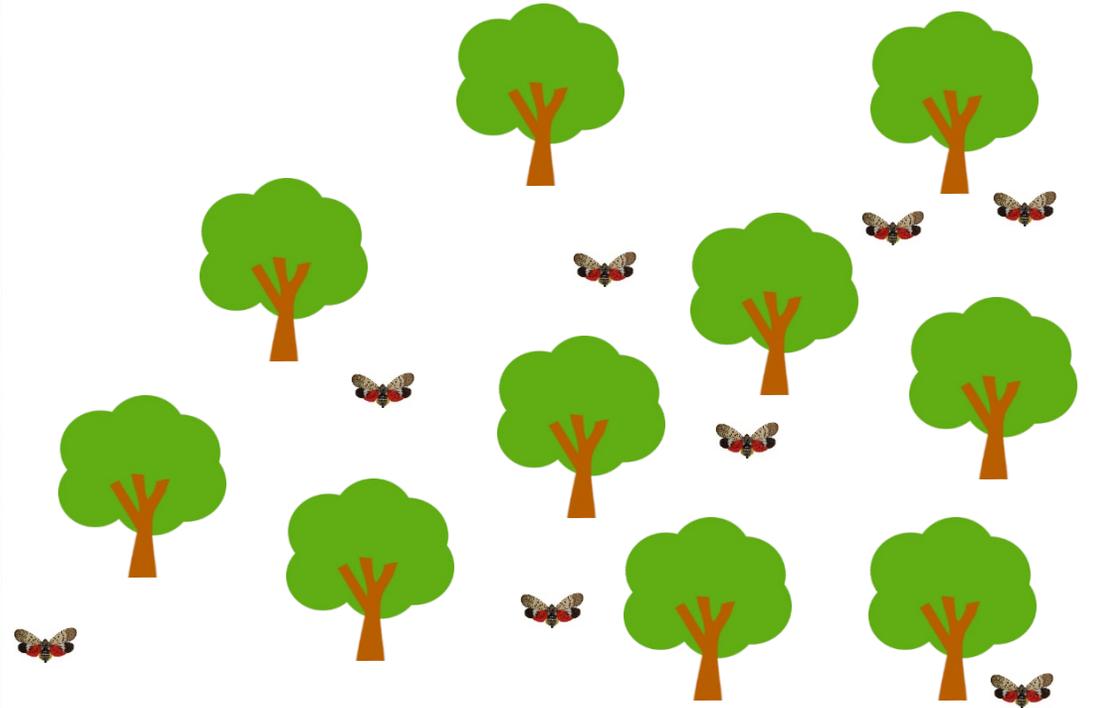
Non-Chemical Control

- *Ailanthus* removal; herbicide application may be necessary
- Scrape, smash, or burn egg masses (Sept-May)
- Chipping of egg-infested wood

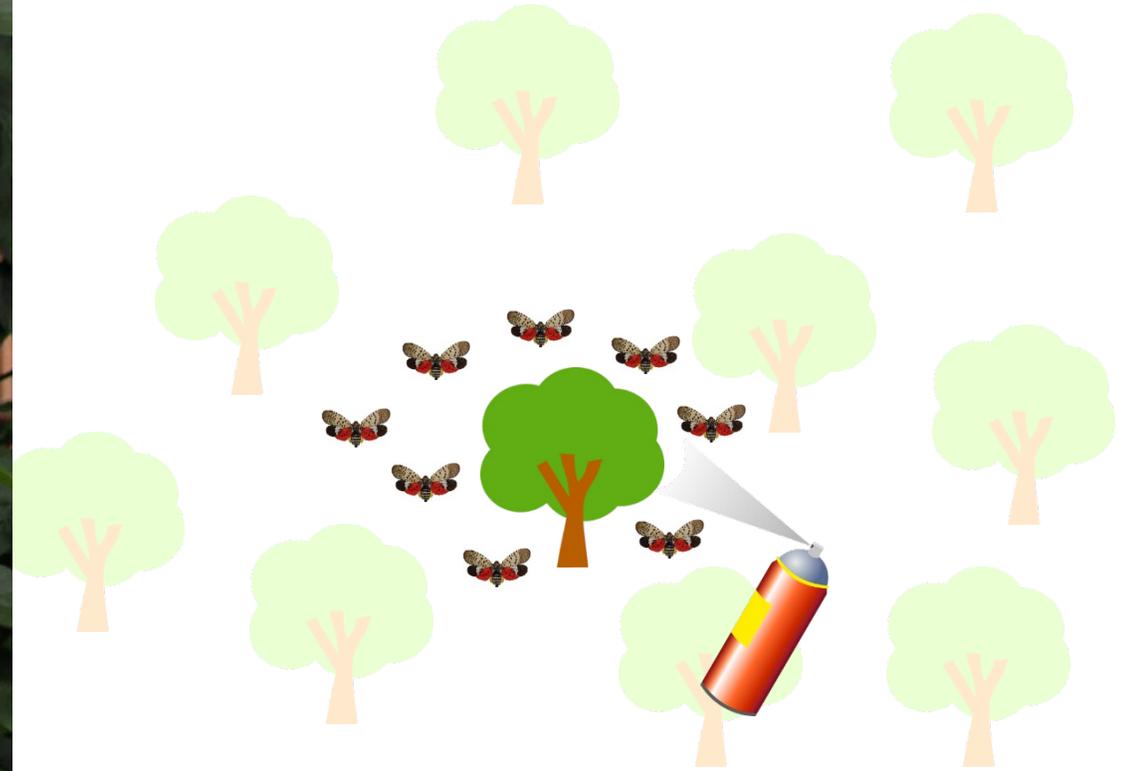
Contact Us



Trap Trees



Trap Trees



Are trap trees the best option?

- *Ailanthus* is a valuable tool for monitoring low-level populations
- Will TOH removal send SLF to other, more desirable plants?



Promote Biological Control



Biological Control - Parasitoids



- *Ooencyrtus kuvanae*: Asian egg parasitoid of gypsy moth (7% parasitism)
- *Anastatus orientalis*: high egg parasitism rates in China (30% egg masses, 40% eggs); in quarantine
- *Dryinus browni*: attacks 2nd-3rd instar nymphs; 40% parasitism reported in China; in quarantine

Biological Control – Fungal Pathogens

Beauveria bassiana



Batkoa major



Chemical Control

- Ovicides
 - JMP Stylet Oil
- Contact Insecticides
 - bifenthrin
 - carbaryl
- Systemic Insecticides
 - Tree injection: dinotefuran or imidacloprid
 - Bark sprays: dinotefuran
 - Soil drenches



Introduction

Spotted lanternfly (SLF), *Lycorma delicatula*, is an invasive planthopper, native to Asia, that was first detected in 2014 in southeastern Pennsylvania. As of May 2019, SLF is now found in Pennsylvania, New Jersey, Virginia, and Delaware. Detections of SLF have been reported in New York, Connecticut, Massachusetts, and Maryland, although established populations are not yet known in these states. It feeds voraciously on many plants, including economically important crops like fruit trees, grapevines, hops, hardwood trees, and ornamentals. While SLF can cause significant damage to plants, it is mostly considered a nuisance pest in the ornamental and landscape industries.

detectable stage because they are large (about 1 inch) and highly mobile. Adults have black bodies. Their forewings are gray with black spots, the tips are black with gray veins, while their hindwings are red, black, and white. Only the adults have wings and can fly. However, because SLF adults hop more than fly, their wings often remain closed, leaving only the forewings visible (Figure 1D).



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Evaluation of insecticides for control of the spotted lanternfly, *Lycorma delicatula*, (Hemiptera: Fulgoridae), a new pest of fruit in the Northeastern U.S.

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Department of Entomology, Pennsylvania State University, PA, USA



September–June
also April–July
July–September
Found July–December

of spotted lanternfly.



Thank you!

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