

**Spotted  
Lanternfly**  
**Permit Training**  
*Part 1: Invasion of  
the Spotted  
Lanternfly*



# Spotted Lanternfly

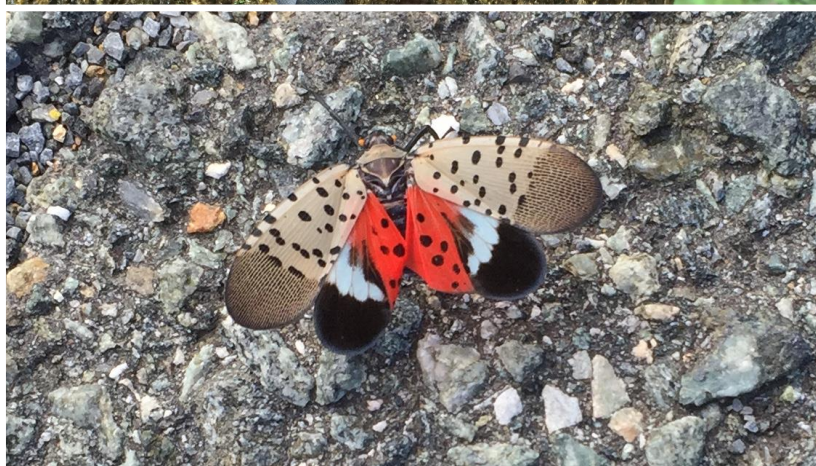
- Discovered in Berks County in September 2014
- Estimated arrival in PA: sometime in 2012
- Native to parts of Asia
- Recently introduced to South Korea



SLF was discovered in Pennsylvania in 2014. Entomologists from the Pennsylvania Department of Agriculture (PDA) estimate it had been here since about 2012, based on the condition of old, weathered egg masses.

SLF is native to parts of Asia. It was accidentally introduced into South Korea in the 2000's. It spread rapidly across that country where it has become a serious pest of grapes.





The spotted lanternfly adult is approximately 1 inch long and ½ inch wide when it is at rest. They have red hind wings which they show when they are startled or when they fly. But most of the time the adults rest with their forewings folded over their backs. These forewings are grey-mauve with black spots.



## **Does not bite or sting people**

SLF does not bite or sting people.

Instead, they have a long, thin, piercing mouthpart called a proboscis that they insert into the trunks, stems, or leaves of host plants and feed on the sap.





## Feeds in swarms

Spotted lanternfly feed in swarms and can greatly diminish crop yields.



## **Excretes honeydew**

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As they feed, the SLF excretes copious amounts of partially digested tree sap called honeydew, which is high in sugar content.





## **Honeydew and Sooty Mold**

This sticky substance quickly accumulates under where the insects feed, and a black sooty mold grows on it. The mold develops an unpleasant odor and the honeydew can attract stinging insects. The sooty mold also can result in decreased photosynthesis for affected vegetation.





## Spotted Lanternfly

Feeds on more than 70 plants, including:

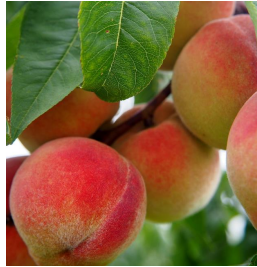
**Grape**



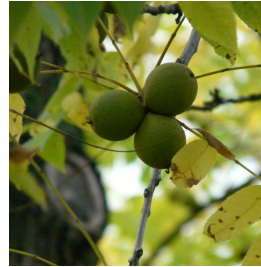
**Apple**



**Peach**



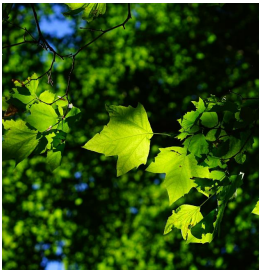
**Black Walnut**



**Maple**



**Sycamore**



**Staghorn Sumac**



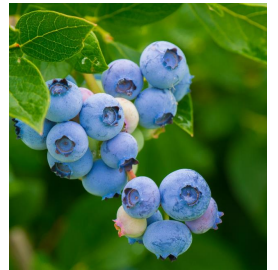
**Hops**



**Vegetables**



**Blueberry**



## What is at Risk for Pennsylvania?

5<sup>th</sup> largest producer of wine grapes

3<sup>rd</sup> largest producer of juice grapes

4<sup>th</sup> largest producer of apples

5<sup>th</sup> largest producer of peaches

***Over 100 million dollars!***

## **What is at Risk for Pennsylvania?**

**#1** exporter of hardwoods (\$19 billion annually)

**3<sup>rd</sup>** largest state park system

**hops**

**vegetables**

**landscaping and nursery stock**

related services



**Spotted  
Lanternfly**  
**Permit Training**  
*Part 2: Quarantine  
Zone and the  
Lifecycle*

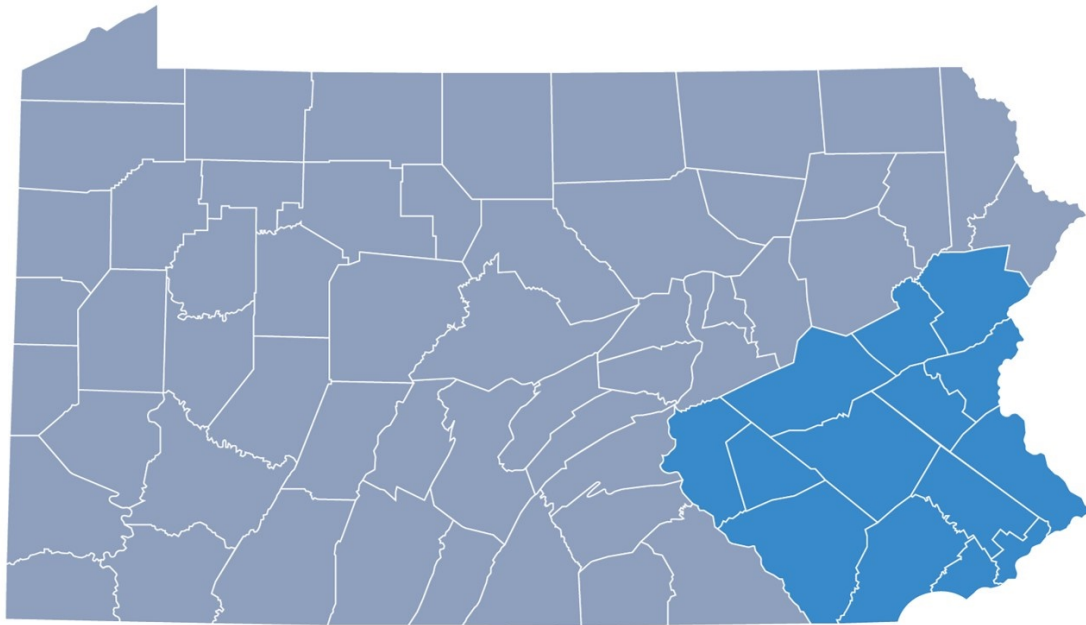


## PDA Spotted Lanternfly Quarantine

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- Safeguard Pennsylvania
- Slow the spread of spotted lanternfly
- Assure trading partners
- Give science and technology time to advance

When the presence of spotted lanternfly was confirmed in 2014, the Pennsylvania Department of Agriculture set up a quarantine area. The quarantine is designed to safeguard Pennsylvania by slowing the spread of spotted lanternfly, assuring our trading partners, and giving science and technology time to advance.



## Quarantine Map (March 2019)

To see latest quarantine area, visit the PDA spotted lanternfly [website](#)

As these insects spread, the quarantine area correspondingly grew and now encompasses most of southeastern Pennsylvania. Chances are it will expand again.  
Note that spotted lanternfly are not uniformly distributed within the quarantine zone—some areas are heavily infested while other areas have few if any spotted lanternfly.





# What does the quarantine mean?

No one may intentionally move viable life stages of spotted lanternfly.

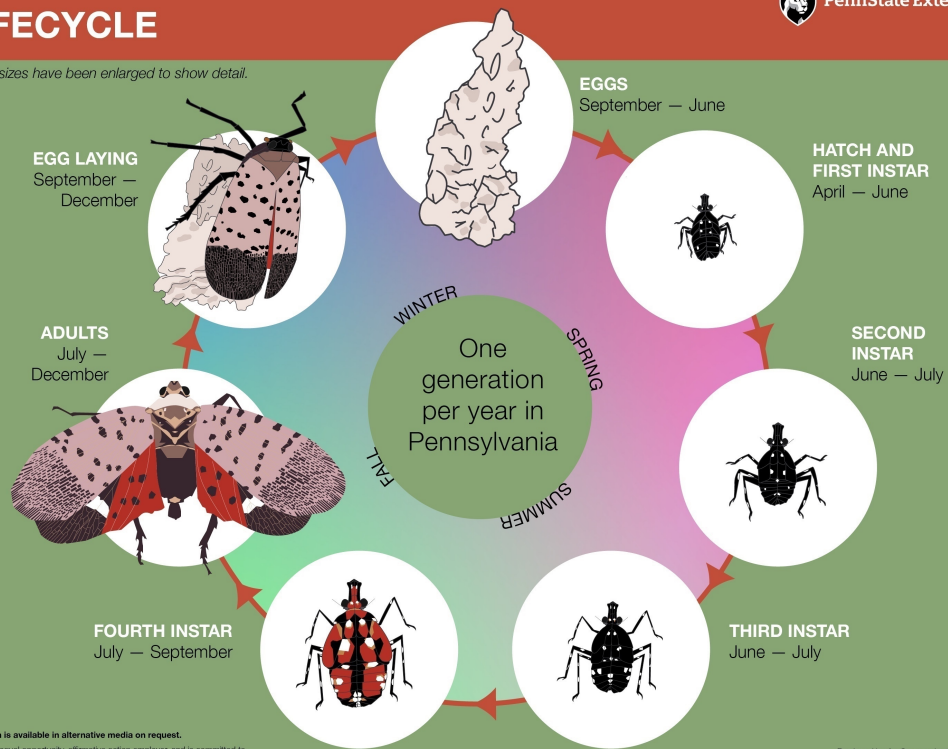
Residents and workers should inspect any items that may have the insects or egg masses before moving the items.

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# SPOTTED LANTERNFLY LIFECYCLE



*Insect sizes have been enlarged to show detail.*



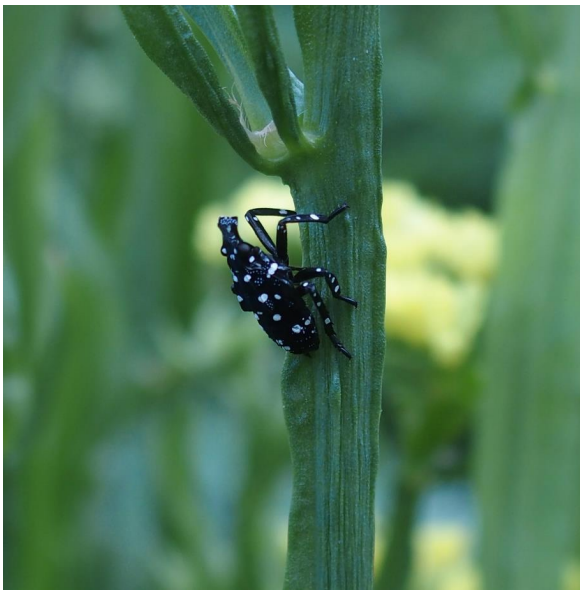
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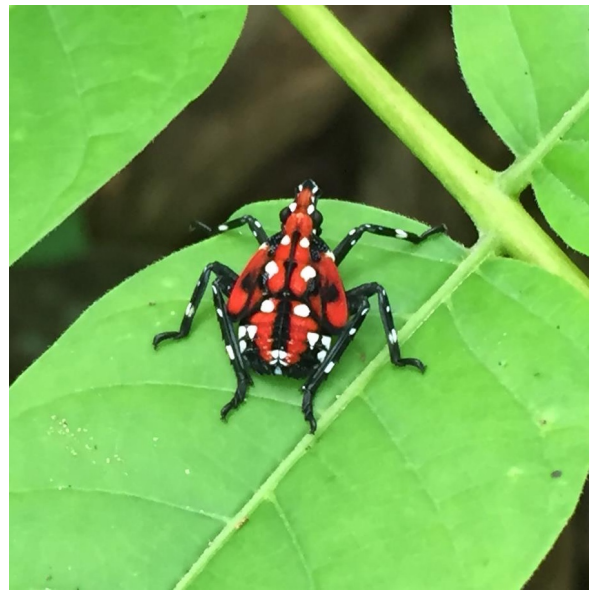
Illustrations by Colleen Wilkowsky

Produced by Ag Communications and Marketing  
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To comply with the quarantine, it helps to understand the spotted lanternfly lifecycle. Note that multiple life stages may be present at one time. For example, in early fall you may see fourth instars, adults, and even egg masses



**First to Third Instar:**  
April through July



**Fourth Instar:**  
July through September

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April through July flightless nymphs hatch and grow. The nymphal stages are called instars. Every time a nymph sheds its skin, it becomes the next instar.

First through third instars all look similar, with black bodies and white spots. But each instar is bigger than the last. First instar nymphs are tiny. They are the size of a tick but move much more quickly and have a different shape.

July through September, the fourth instars emerge.

Fourth instars are bright red with white spots and black bodies. They are strong jumpers and will often jump away when approached or prodded.





**Adults:**  
July through December



**Egg Laying:**  
September through December

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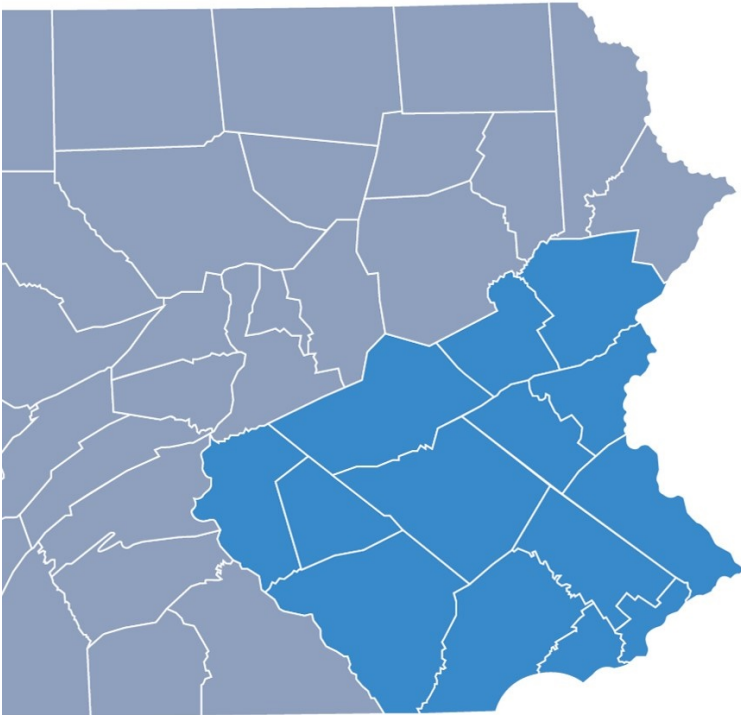
Starting in late July, the 4th instar nymphs transition into adults. Adults feed on the woody parts of plants and can be present in very high numbers. The females lay eggs September through December. Each female can lay multiple egg masses. Each egg mass has between 30 and 50 eggs.



Spotted lanternfly are great hitchhikers. Adults can hop and fly, and both adults and nymphs are good at clinging to most surfaces, including the outside of moving vehicles. Egg masses could be on any flat surface.



## Quarantine restrictions apply to:



- Brush, debris, bark, or yard waste
- Landscaping, remodeling, and construction waste
- Logs, stumps or any tree parts
- Firewood
- Packing materials like wood crates
- All plants and plant parts
- Outdoor items like grills, chairs, and tables
- Vehicles, trailers, and equipment not stored indoors
- Hardgoods (stone, tile, and decorative materials)

***...and more!***



### Checklist for Residents Living in Spotted Lanternfly Quarantine Areas

**IMPORTANT:** Before you move outdoor items from the quarantine area, check for spotted lanternfly egg masses, adults, and nymphs. Make sure all items are pest free before you move them. Help keep this pest from spreading.

**Check before you move**

Recreational or Camping Items

<input type="checkbox"/> Backpacks	<input type="checkbox"/> Ice chests	<input type="checkbox"/> Tarps
<input type="checkbox"/> Basketball backboards	<input type="checkbox"/> Motorcycles	<input type="checkbox"/> Tents
<input type="checkbox"/> Bicycles	<input type="checkbox"/> Motor homes	<input type="checkbox"/> Other
<input type="checkbox"/> Boats/Boat trailers	<input type="checkbox"/> Recreational vehicles	
<input type="checkbox"/> Campers	<input type="checkbox"/> Snowmobiles	

Outdoor Household Items

<input type="checkbox"/> Barrels	<input type="checkbox"/> Propane or oil tanks	<input type="checkbox"/> Storm/Screen doors and windows
<input type="checkbox"/> Cardboard or wooden boxes	<input type="checkbox"/> Trash cans	<input type="checkbox"/> Window awnings
<input type="checkbox"/> Outdoor poles	<input type="checkbox"/> Refrigerators/Freezers	<input type="checkbox"/> Outdoor furniture
<input type="checkbox"/> Plant containers	<input type="checkbox"/> Storage sheds	<input type="checkbox"/> Other
<input type="checkbox"/> Firewood	<input type="checkbox"/> Shutters	

Building Materials

<input type="checkbox"/> Bricks/Cinder blocks	<input type="checkbox"/> Roofing materials	<input type="checkbox"/> Skidsters/Forklifts
<input type="checkbox"/> Cement mixing tubs	<input type="checkbox"/> Tools and toolboxes	<input type="checkbox"/> Pipes
<input type="checkbox"/> Lumber	<input type="checkbox"/> Workbenches	<input type="checkbox"/> Other

Yard and Garden Items

<input type="checkbox"/> Dog houses, rabbit sheds, chicken coops, etc	<input type="checkbox"/> Garden tillers	<input type="checkbox"/> Signs and posts
<input type="checkbox"/> Barbecue grills	<input type="checkbox"/> Yard decorations	<input type="checkbox"/> Storage sheds
<input type="checkbox"/> Carts	<input type="checkbox"/> Garden tools	<input type="checkbox"/> Tractors and trailers
<input type="checkbox"/> Cold frames	<input type="checkbox"/> Backhoes	<input type="checkbox"/> Trees, shrubs and plants
<input type="checkbox"/> Fencing	<input type="checkbox"/> Lawnmowers	<input type="checkbox"/> Other

Children's Playthings

<input type="checkbox"/> Play houses	<input type="checkbox"/> Bicycles, scooters	<input type="checkbox"/> Other
<input type="checkbox"/> Kiddie pools	<input type="checkbox"/> Sandboxes	

### Checklist for Residents Living in Spotted Lanternfly Quarantine Areas

**IMPORTANT:** Before you move outdoor items from the quarantine area, check for spotted lanternfly egg masses, adults, and nymphs. Make sure all items are pest free before you move them. Help keep this pest from spreading.

If you find any of these life stages of the Spotted Lanternfly, remove, devitalize, place in a sealed bag, and dispose of bag in the garbage.



Adult Spotted Lanternfly, present in autumn months.



Fresh Spotted Lanternfly egg mass (outlined in red). Egg masses are present in autumn and winter months, blending in with their surroundings.



Spotted Lanternfly nymphs, present in spring and summer months. (Images from Park et al. 2009)



By signing this checklist, I am confirming that I have inspected my vehicle and those items I am moving from the Spotted Lanternfly quarantine area, and do not see any egg masses or insects in or on anything I am moving.

Signature: \_\_\_\_\_ Address: \_\_\_\_\_ Date: \_\_\_\_\_

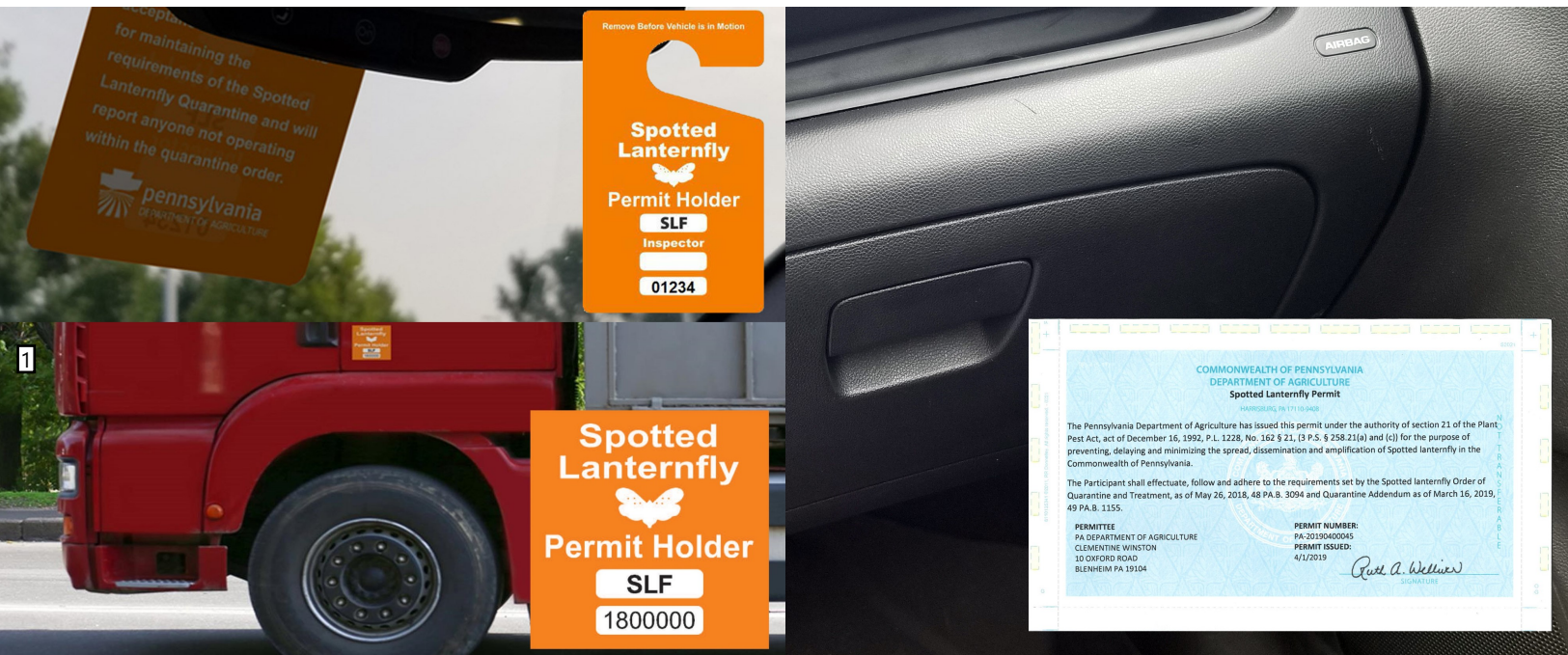
Please sign, date, and keep this checklist in your vehicle with you – use it each time you need it.

For more information, visit the Pennsylvania Department of Agriculture website:  
[www.pda.state.pa.us/spottedlanternfly](http://www.pda.state.pa.us/spottedlanternfly)



Private citizens within the quarantine area who want to move any items outside the quarantine zone should complete the Compliance Checklist and take it with them when they move the items.





# Spotted Lanternfly Permits

## For businesses that move items within and out of the quarantine zone

If your business regularly moves items within the quarantine zone or across the boundaries of the quarantine zone, your company vehicles must carry a spotted lanternfly permit.

This permit indicates that a trained employee has inspected the vehicle and its contents and that they are free of spotted lanternfly.

From program inception until April 2019, the PDA issued hangtag and decal permits. In April 2019, the PDA transitioned to a paper permit.

A copy of the paper permit should be kept with the registration packet or in a permit book.

If you have hangtag permits, they can be displayed on the review mirror or dash while the vehicle is parked. Please remove while in motion. You can also keep hangtags inside the truck with the registration packet or permit book.

Decal permits can be placed on the driver door/panel or kept inside the truck with the registration packet or permit book.

Drivers need to show the assigned permit if they are stopped at a checkpoint.

**Spotted  
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**Permit Training**  
*Part 3: What You  
Can Do*



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# Help stop the spread of spotted lanternfly by following biosecurity best practices.



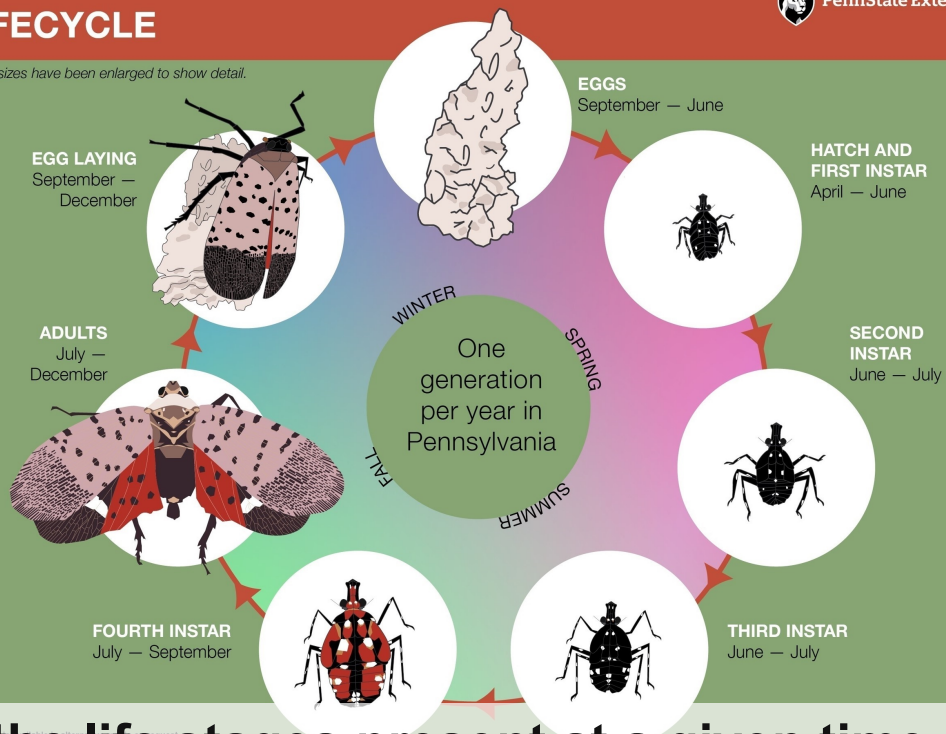
The most important action in the fight against the spotted lanternfly is to stop it from spreading—both within the quarantine zone and especially beyond the quarantine zone. This is where you and your fellow workers play a critical role.



# SPOTTED LANTERNFLY LIFECYCLE



*Insect sizes have been enlarged to show detail.*

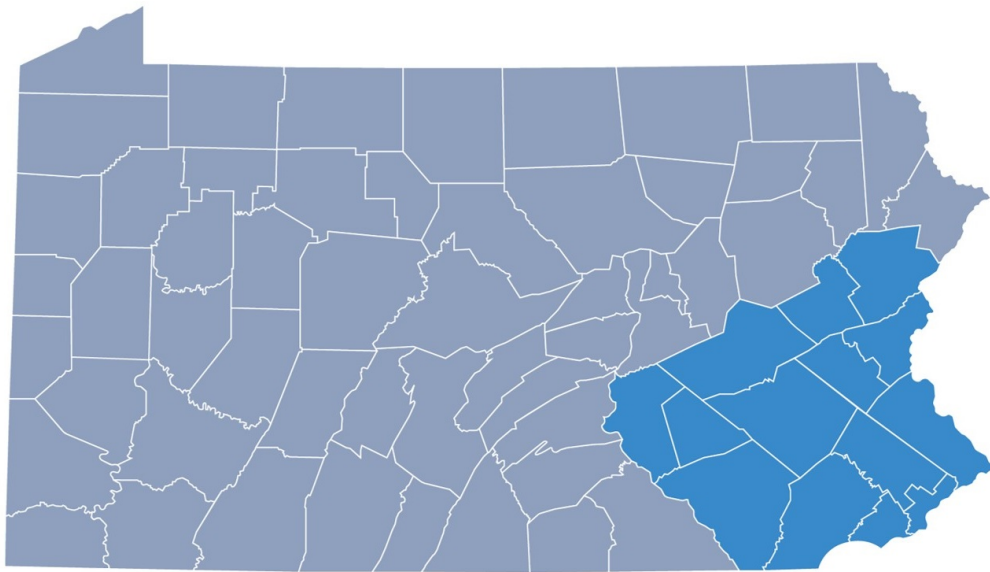


**Be aware of the life stages present at a given time of the year.**

color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status. Illustrations by Loren Winkowski. © The Pennsylvania State University 2010. LUCAS: 2006-HEV013001

Be aware of the life stages of the insect that could be present so that you know what to look for when you inspect vehicles and equipment.





## **Know when you are in an infested area.**

Know when you are in an infested area. Check the PDA spotted lanternfly website to see if you are in the quarantine zone. Remember that spotted lanternfly are not uniformly distributed within the quarantine zone—some areas are heavily infested while other areas have few if any spotted lanternfly. If you live on an infested property or visit infested properties for work, be aware that you, your vehicle, and your equipment can harbor hitchhiking insects. Check for them frequently.

## Biosecurity Best Practices



Do **not** park under trees or tree lines.



Do **not** leave vehicles open.

***If possible, store vehicles and equipment inside.***

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Do not park under trees or tree lines, if possible. Spotted lanternflies tend to congregate in trees. Not only does parking near trees increase the possibility of hitchhiking, but the insects will coat anything below them, including your vehicle and equipment, with sticky honeydew.

## Biosecurity Best Practices



In heavily infested areas,  
tuck pant legs into socks.



Make sure none are  
resting on your person.

Do not leave vehicles open-- shut windows, trunks, hatches, and tailgates. Insects can and will enter any open portals. If possible, store vehicles and equipment inside.

Be sure to scan the interior of the vehicle and kill any insects you find before leaving the area.

If you are in a heavily infested area, tuck your pant legs into your socks to prevent adults from crawling inside your clothing.

Before entering your vehicle, make sure that none are resting on your person.





**Swat or smash as many as you can!**

Remember that spotted lanternflies will not harm people or animals, so feel free to swat and smash as many as you can, wherever you are!





## Chip woody debris (1 inch chips)

Chipped woody debris is safe to move. Putting wood through a chipper to produce 1 inch chips has been proven to disrupt the egg masses so that they do not hatch.

1



**Before moving equipment and supplies, inspect for insects and egg masses.**

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Before moving equipment or supplies from an infested area, regardless of whether they were stored near a tree line, inspect for and destroy any egg masses.





## **Scrape and destroy egg masses.**

Spotted lanternflies lay their egg masses on just about any handy surface - fence posts, cinder blocks, rusty metal, and more.

From mid-September through spring, spotted lanternfly egg masses are the number one way this pest is transported. Therefore, it is important that you search for and destroy egg masses on equipment and other items before you move them.



# Report Sightings of Spotted Lanternfly

Visit the **Penn State Extension Website:**

<https://extension.psu.edu/spotted-lanternfly>

Or Contact the **Spotted Lanternfly Hotline:**

**1-888-4BAD-FLY**

(1-888-422-3359)



The Pennsylvania Department of Agriculture and Penn State Extension are closely tracking where spotted lanternflies are found. If you see what you think is a spotted lanternfly or spotted lanternfly egg mass, please take a picture of it if you can, kill it, and report it on the Penn State Extension Website or call the Spotted Lanternfly Hotline.

If you find it outside of the quarantine zone, it would be helpful if you preserve it in alcohol for easier verification

**Spotted  
Lanternfly**  
**Permit Training**  
*Part 4: Search For  
and Destroy Egg  
Masses*



# Egg Masses

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- Columns of eggs
- 30 – 50 eggs per mass
- Overall length: usually about an inch



The spotted lanternfly lays columns of eggs side by side. There can be as many as 30 to 50 eggs per mass. The overall length of an egg mass is usually about 1 inch.





**Egg mass coverings start out shiny gray and putty-like.**

The female covers the eggs in a grey putty-like covering. At first the covering is shiny.

## Egg Mass Covering



**Dries and cracks over time.**

The covering gradually dries out and cracks over time. These two photos show the same egg mass taken four months apart. You can see how the covering has deteriorated.



1



## Covered and Uncovered Egg Masses

Females may not cover all the eggs, as you can see in these two egg masses.



1



**Find the egg mass.**





**Find the egg mass.**







**Find the egg masses.**







**Find the egg masses.**



1



**Find the egg masses.**







**Find the egg masses.**





1



**Find the egg masses.**







**Find the egg masses.**



1



**Find the egg mass.**







**Find the egg mass.**





1



**Find the egg masses.**







**Find the egg masses.**





## Spotted Lanternfly and Gypsy Moth Egg Masses



**Spotted Lanternfly**



**Gypsy Moth**

Gypsy moth's egg masses have a similar appearance to spotted lanternfly. Many of the same surfaces are used by both species. The covering for gypsy moth is more fibrous and generally tanner in color. Gypsy moth eggs are more spherical than spotted lanternfly eggs. Feel free to destroy gypsy moth egg masses too!



## **Scrape and destroy egg masses.**

What should you do when you find egg masses?

You can practice mechanical control by scraping and destroying egg masses. If you scrape the eggs into a container of rubbing alcohol, that will kill them. Then double-bag them and throw them away. You can also smash the eggs.



**Spotted  
Lanternfly**  
**Permit Training**  
*Part 5: Controlling  
Spotted Lanternfly  
on Your Property*



## Spotted Lanternfly Management

- Trap tree method using Ailanthus (tree-of-heaven)
- Tree banding
- Insecticides



There are several methods you can use to manage SLF





**Spotted lanternfly and ailanthus (tree-of-heaven)**

Spotted lanternfly's favorite food, especially in the adult life stage, is the invasive tree *Ailanthus altissima*, also called tree-of-heaven. If this tree is available, spotted lanternflies will preferentially feed on it. We can use this attraction to our advantage by using tree-of-heaven as a "trap tree."

## Spotted Lanternfly Management: TrapTree Method



1. Kill most tree-of-heaven on the property.
2. Treat remaining tree-of-heaven (the traps trees) with systemic pesticide.
3. Spotted lanternfly feed on the trap trees and die.

### Visit

<https://extension.psu.edu/spotted-lanternfly> for information on identifying tree-of-heaven and using the trap tree method.

To follow this method, you must first kill most of your *Ailanthus* (that is, tree-of-heaven) trees, leaving just a few to serve as trap trees.

Tree-of-heaven trees can be male or female. Try to leave only male trees. Female trees prolifically produce seeds (several hundred thousand each year!) so prioritize killing female trees.

Then apply a systematic insecticide to the remaining *Ailanthus* trees. A systemic insecticide is absorbed into the living tissue of the plant.

In the late summer and fall, the adult spotted lanternflies will move to the trap trees.

When the spotted lanternflies feed on the trees, they ingest the insecticide and die.





## Spotted Lanternfly Management: Tree Banding

Bands of sticky tape bands on trees can trap spotted lanternflies and are especially effective in trapping the immature nymphs.

Using sticky bands is a chemical-free way of killing these invaders. However, they can also capture other creatures, including beneficial insects and occasionally a bird or small mammal.

You can purchase sticky bands from several commercial sources, or you can make your own bands.