Spotted Lanternfly in Pennsylvania

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Spotted Lanternfly in Pennsylvania

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On September 22, 2014, the Entomology Program of the Pennsylvania Department of Agriculture received a report from an educator from the Pennsylvania Game Commission

The report detailed damage to Ailanthus altissima (Tree of Heaven) on private property in Eastern Berks County, PA being caused by an unknown insect

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The spotted lanternfly is native to Asia and is found in China, Bangladesh, Vietnam

It was introduced to Japan, South Korea and Pennsylvania

In South Korea, it is considered an invasive pest and impacts grapes and peaches

FLOW

Follow FLOW:

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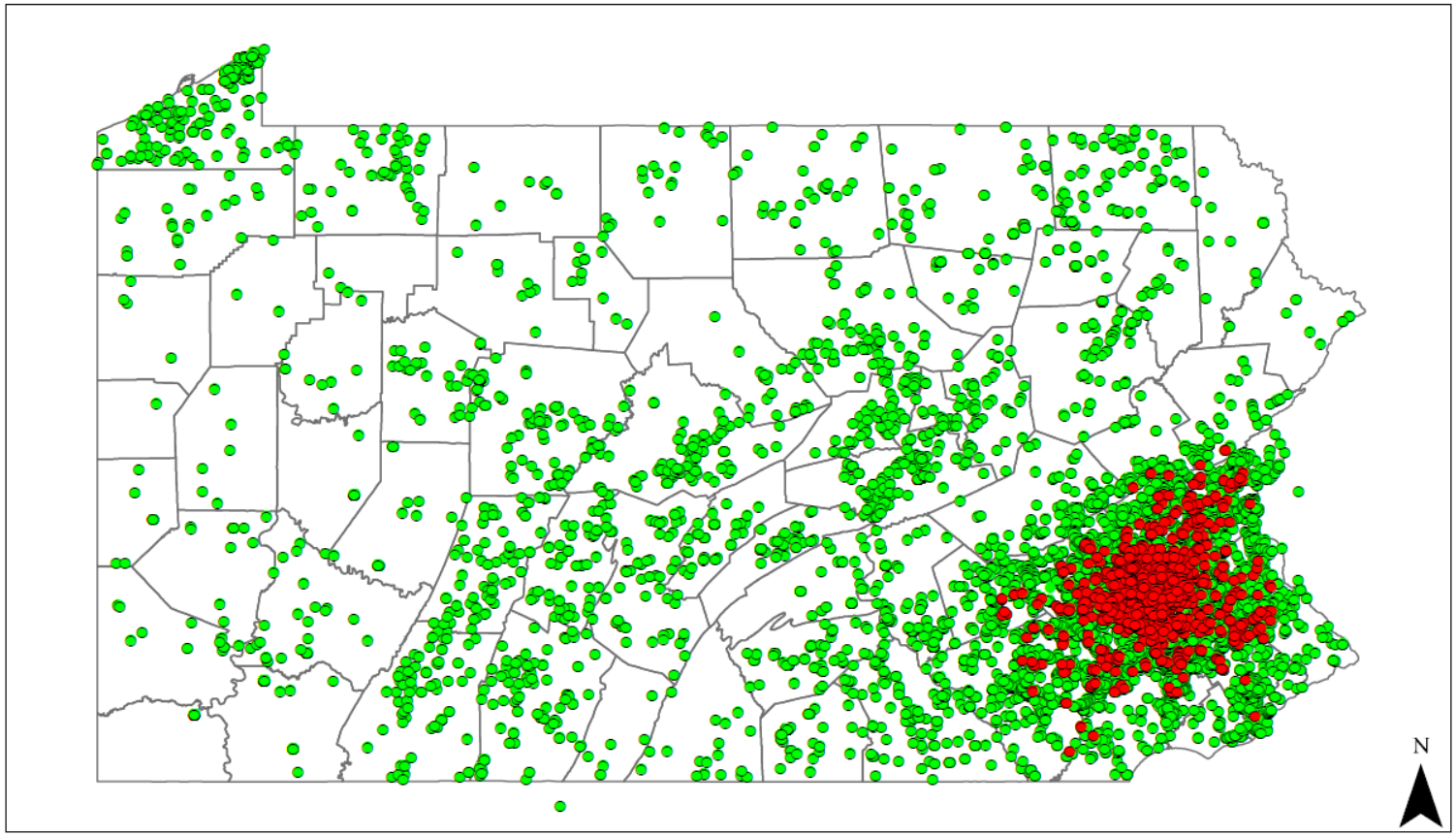
Current Distribution

2014 -- 2017 Lycorma Detection Survey
Results through 12 October 2017



Spotted Lanternfly Presence

- Positive
- Negative

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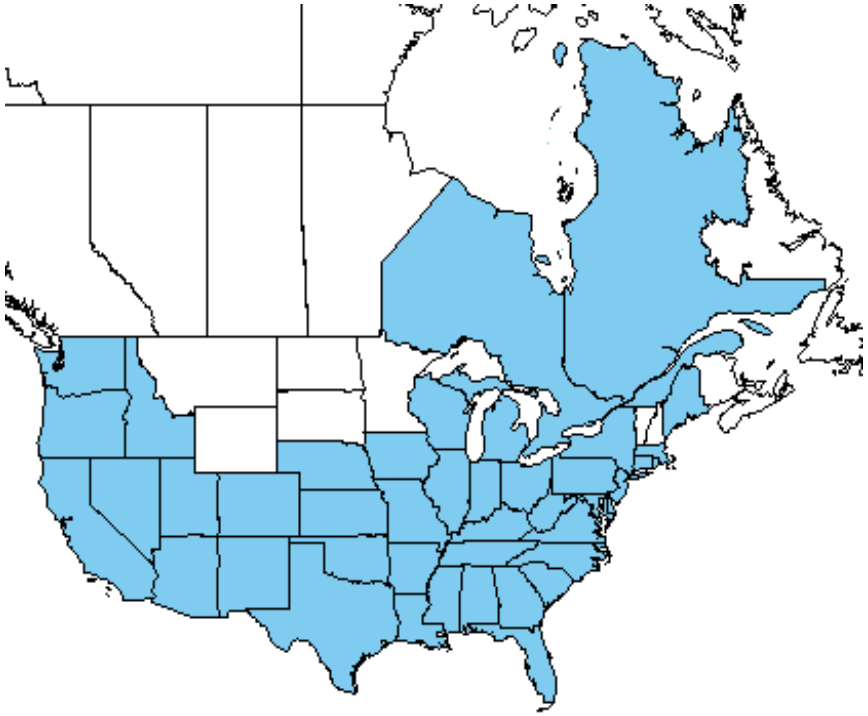
Spotted Lanternfly makes use of over 70 different plant species, but strongly prefers the invasive “Tree of Heaven”



Tree of Heaven Distribution-USDA PLANTS Database

What Is At Risk for Pennsylvania?

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Current Values of Some Commodities Affected

- Forest Products: $16.7 billion
- Grapes: $28 million
- Apples: $87 million
- Peaches: $19 million
- Nursery and Landscape: $944 million

Unable to Estimate Value of Losses

- Property Values
- Tourism at PA parks and Game Lands
- PA Ecosystems
- New Business Initiatives
  - Port of Philadelphia
  - PA Preferred Brew

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Impact:

Damage reported on basil, blueberry, cucumber and horseradish in 2017

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Adults: July - December

Egg Laying: September - November

Eggs: October - June

Fourth Instar: July - September

One Generation Per Year

Hatch and 1st Instar: May - June

Third Instar: June - July

Second Instar: June - July

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Egg masses contain between 30-50 eggs, are laid on many different objects, and are often well hidden

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All life stages can hitchhike to new areas, but eggs and adults pose the greatest risk for movement

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Removal-Trap Tree Method
Most Ailanthus are removed or killed with herbicide
Incorporate in Vegetation Management Plans

Spotted Lanternfly in Pennsylvania

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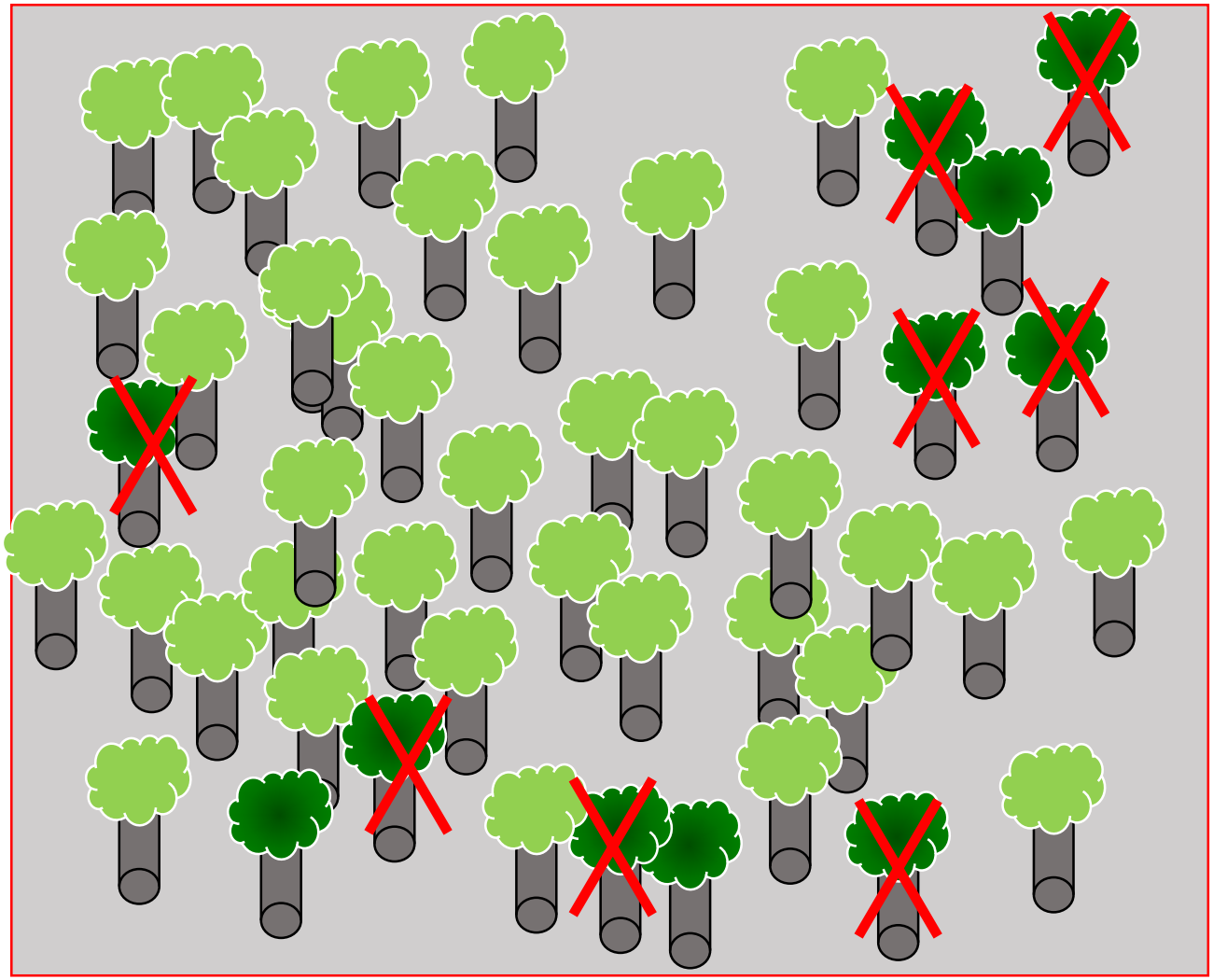

Host Reduction

Remove Most Ailanthus

Leave a few male trees and treat with systemic insecticide

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Trap trees

July-September
4th Instar and Adults

SLFs concentrate to feed on Tree of Heaven with insecticide and die

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Impact on Adults is Dramatic

Spotted Lanternfly in Pennsylvania

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Impact:

Adult clustering, swarming and Honeydew accumulation can impact quality of life.

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Spotted Lanternfly in Pennsylvania

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Spotted Lanternfly in Pennsylvania

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As the population of spotted lanternfly grows, and the insect adapts, new threats to multiple industries emerge

It is clear that more help is needed to contain this pest

Everyone needs to work to control the insect

Spotted Lanternfly in Pennsylvania

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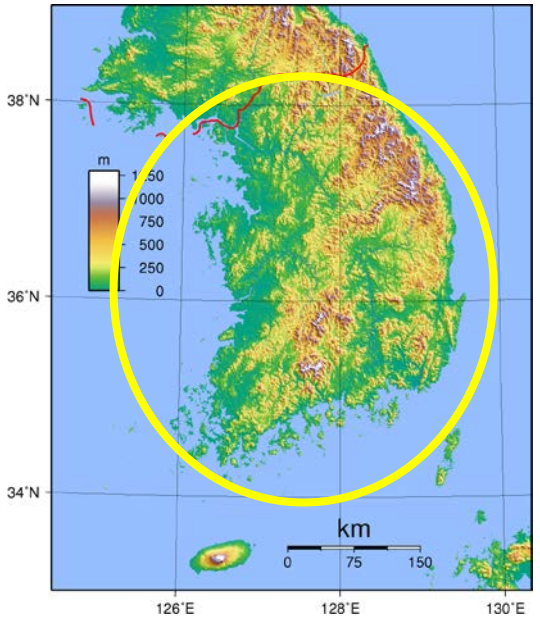
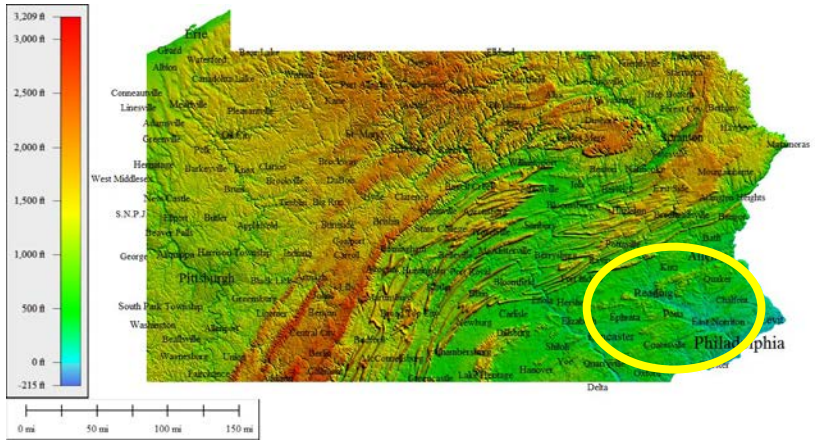
South Korea at 38,622 sq. miles is slightly smaller than Pennsylvania at 46,055 sq. miles



South Korea completely infested in 3 years with 3 introductions

PA still contained to small area, 1 introduction



Quarantine

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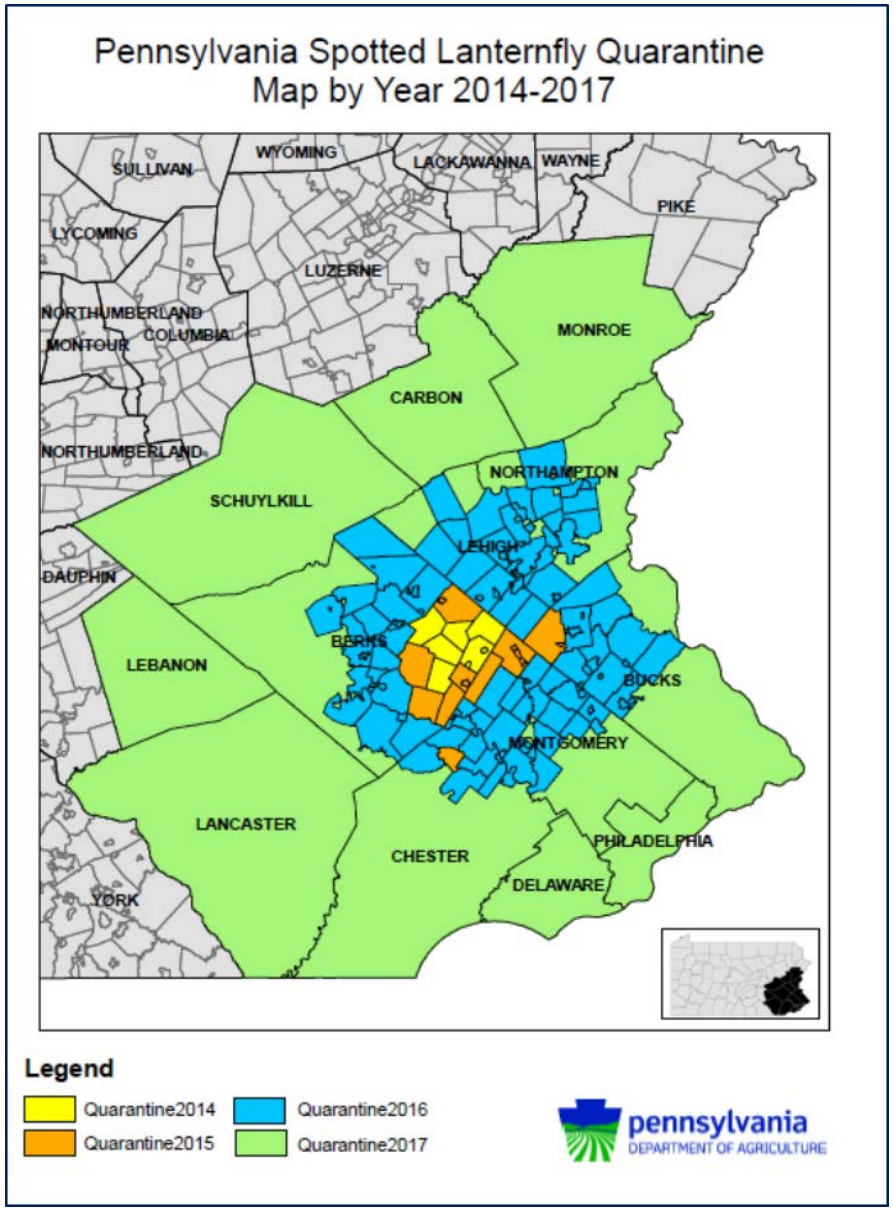

Quarantine

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Covers all life stages and conveyances

Limits movement of commodities and home articles

May allow continued interstate and international trade.

Requires inspection and safe movement from the quarantine

Slows processes and trade down, but does not completely stop trade

Wood recycling can still be completed, but may need think about how is done

Lumber harvest may still be made, but may need timelines

Quarantine

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Working with Business

- Risk Assessment
- Education/Training
- Phytosanitary Certificate
- Permit
- Compliance Agreement
- Verification

Quarantine

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- Phytosanitary Certificate
  - Limited use
- Permits
  - Working within the quarantine
  - Lower risk
- Compliance Agreement
  - Moving in and out of the quarantine
  - Interstate/International businesses
  - Higher risk for movement

Assistance With Compliance

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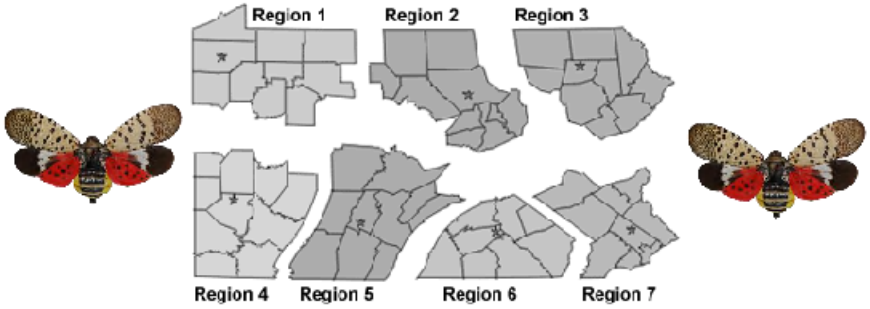
For Compliance Agreements for Spotted Lanternfly Quarantine

For information and questions regarding compliance agreements related to Spotted Lanternfly please contact your Pennsylvania Department of Agriculture Regional Office and speak with the Bureau of Plant Industry Supervisor (listed below).



Region 1: Clarion, Crawford, Elk, Erie, Forest, Jefferson, McKean, Mercer, Venango, and Warren
Lisa K. Candelore
Phone: (814) 332-6890

Region 2: Cameron, Clinton, Columbia, Lycoming, Northumberland, Montour, Potter, Snyder, Tioga, and Union
Jay P. Bagley
Phone: (570) 433-2640 ext. 206

Region 3: Bradford, Carbon, Lackawanna, Luzerne, Monroe, Pike, Sullivan, Susquehanna, Wayne, and Wyoming
Richard J. Malak
Phone: (570) 836-2181 ext. 111

Region 4: Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Indiana, Lawrence, Washington, and Westmoreland
Lisa K. Candelore
Phone: (724) 832-1073 ext. 125

Region 5: Bedford, Blair, Cambria, Centre, Clearfield, Fulton, Huntington, Juniata, Mifflin, and Somerset
Abbie Clark
Phone: (814) 793-1849 ext. 216

Region 6: Adams, Cumberland, Dauphin, Franklin, Lebanon, Lancaster, Perry and York
Jeff Miller
Phone: (717) 772-5206

Region 7: Berks, Bucks, Chester, Delaware, Lehigh, Montgomery, Northampton, Philadelphia, and Schuylkill
Howard Walker
Phone: (610) 489-1003 ext. 108

Spotted Lanternfly Quarantine as of November 4, 2017

Everyone is Threatened

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- We must work together to control
- Integrated Pest Management
  - Ailanthus control
  - Insecticide Application
  - Banding
  - Egg Mass Scraping
  - Look Before You Leave
- Educate the community residents and businesses
  - Spotted Lanternfly will not “eat” buildings
  - Spotted Lanternfly does not suck blood or bite people or animals
  - Licensed Professionals for control

Spotted Lanternfly Biosecurity

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Everyone Can Help Contain Spotted Lanternfly While on the Job

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Spotted Lanternfly is new to North America

It is a pest of Agricultural commodities like Grape, Hops, Apples, Hardwoods, Nursery Stock, and makes use of numerous other plants and vines like basil, horseradish, oregano, cucumber, blueberry, bittersweet, Virginia creeper and many other plants.

Spotted Lanternfly Biosecurity

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Spotted Lanternfly is an active hitchhiker and makes use of many modes of human assisted transport

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Automobiles, Construction Equipment and Signs, Storage Pods, Yard Waste, Trains, Horse Trailers, Nursery Stock, Dog Crates, Pallets, Boats, Hunting Equipment, Campers, and any other object stored outside can all harbor Spotted Lanternfly life stages

Spotted Lanternfly Biosecurity

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You can prevent the spread of this unwanted pest by practicing biosecurity basics.

First- Know the life stages of the pest and when they are likely to be a threat

Second- Be aware of when you are in an infested area

Third- Follow biosecurity best practices

Fourth- Go the extra mile when you know you are exposed to Spotted Lanternfly

Spotted Lanternfly Biosecurity

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Life Cycle
One Generation Per Year

Autumn

Adults: July 24-December

Egg Laying:
September - November

Winter

Eggs: Late September-June

Fourth Instar:
July - September

Third Instar: June - Mid-July

Summer

Second Instar: May - June

Hatch and 1st Instar:
Late April- June

Spring

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Adults and eggs pose the greatest risk for hitchhiking

Spotted Lanternfly Biosecurity

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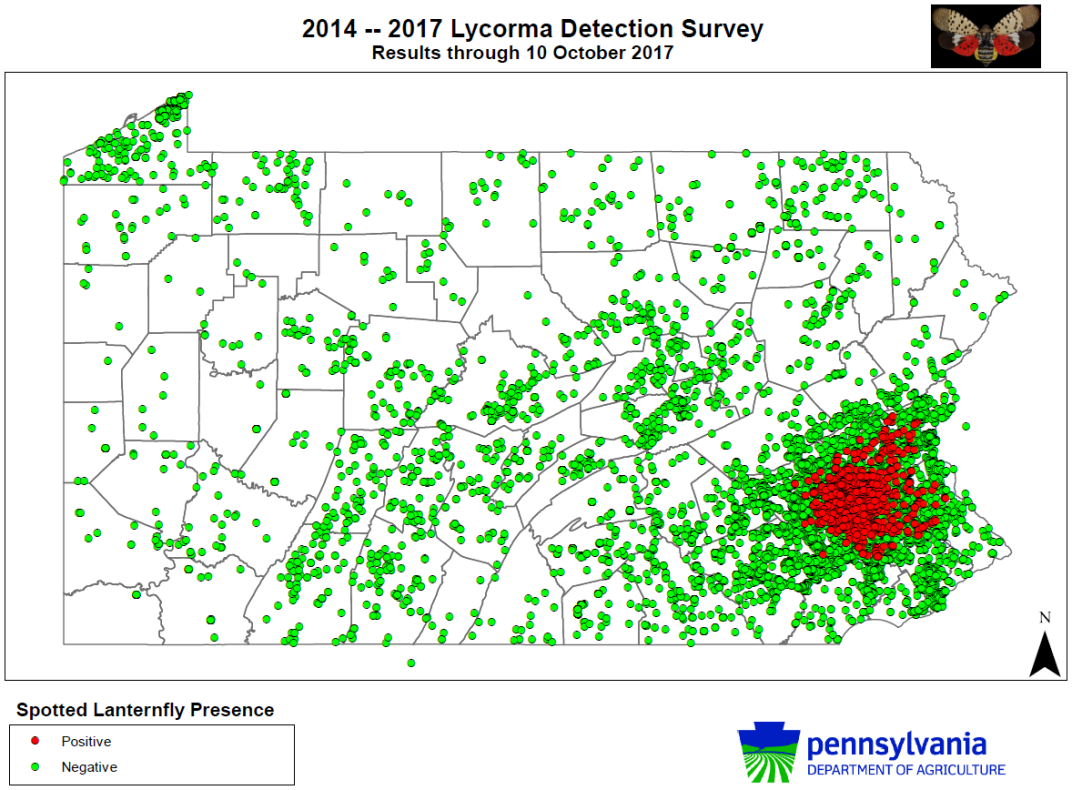
Currently Spotted Lanternfly is only found in Southeastern Pennsylvania

Take extra care when working in any area where the pest is known to exist.

Maps showing infested and quarantined areas are posted weekly on this web-site:

Quarantine Search Tool



Spotted Lanternfly Biosecurity

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Basic biosecurity for insect pests: Short Term

If you live on an infested property or visit infested properties for work, be mindful that you, your vehicle, and your equipment are the potential pathways for the insect to hitchhike

Whenever possible, do not park under trees or tree lines

Avoid leaving vehicles open, shut windows, trunks, hatches, and tailgates if possible

Tuck pant legs into socks to prevent adults from crawling inside your clothing, and check to ensure that none are resting on you before entering your vehicle

In heavy infestations, insects may swarm, and preventing them from entering your vehicle can be a challenge, so take a moment to scan the interior of the vehicle and kill any specimens found before leaving the area

Spotted Lanternfly Biosecurity

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Basic biosecurity for insect pests: Short Term

Equipment for the transport of live animals presents a special challenge. Horse trailers, dog crates, and bear traps are all open and exposed to easy entrance by swarming adults. When not in use, animal carriers should be stored so as to prevent insect entry and inspect them prior to use if in an infested area.

Avoid storing these items in tree lines

Consider screening or tarping if practical

After use, inspect for hitchhikers and kill any found

Spotted Lanternfly Biosecurity

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Basic biosecurity for insect pests: Long Term

From Mid-September through spring Spotted Lanternfly egg masses are the number one way this pest can move

Equipment and materials stored outside can be a surface for egg laying

Avoid parking equipment or stacking materials near tree lines

Ensure that trimmed woody debris is chipped

Before moving equipment or supplies from an infested area, inspect for and destroy any egg masses

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Egg masses are easily controlled by scraping

Spotted Lanternfly

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Integrated Pest Management

Spotted Lanternfly in Pennsylvania

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Impact:

Adults in high populations can be disruptive to residents and impact daily lives.

Quality of life will be changed for many.

IPM for SLF Control

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- **SLF Requires Multiple Approaches**
  - **Scraping Egg Masses**
  - **Banding Trees**
  - **Mechanical Removal and Processing**
  - **Ailanthus Control**
  - **Pesticide Applications**
    - **Herbicide**
    - **Systemic**
    - **Contact**

Spotted Lanternfly in Pennsylvania

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Adults: July - December

Egg Laying: September - November

Eggs: October - June

Fourth Instar: July - September

One Generation Per Year

Hatch and 1st Instar: May - June

Third Instar: June - July

Second Instar: June - July

Scraping Control

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- Scraping egg masses is something everyone can do
- PSU Extension has a video on proper techniques
- Removes 30-50 eggs per mass
- Eggs laid on more than wood products.

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Egg masses that can be seen or reached are easily controlled by scraping

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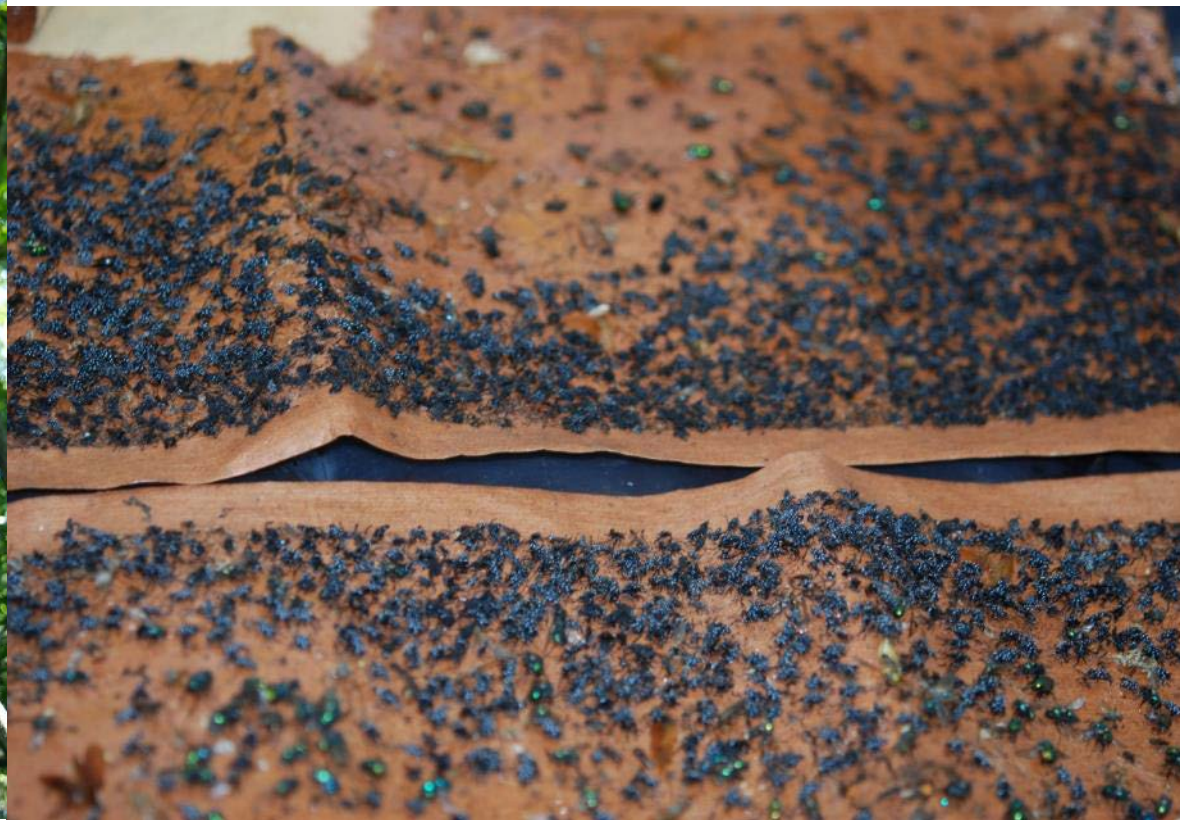
Immature stages migrate up trees/plants each day and are easily caught on sticky tree bands



Banding Control

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Uses known behavior of nymphs going up trees each day against the insect

Target Ailanthus if they are in the area

No pesticides used with tree bands

Banding Control

Glue is able to capture adults

Always check bi-catch, sometimes birds going after insects for easy meals may end up on glue

Volunteer banding program has about 34 volunteers. Extension will oversee

Mechanical Control

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- Physical removal
- Exclusion from conveyances
- Swatting/Squishing
- Chipping
  - Study shows chipping disrupts egg masses and prevents hatching

Predators

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- Limited Observations of native predators
  - Praying Mantis
  - Wheel Bug/Assassin Beetle
- Parasitic Wasps
  - Ooencyrtus kuvanae
- Development of new bio control

Insecticide Application

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How to Eliminate or Control Spotted Lanternfly Adults:

If you find Spotted Lanternflies in a municipality where they are known to exist, you should try to kill them.

The most effective way to eliminate these insects is to disrupt their favorite food and hang-out. In late summer and fall, Spotted Lanternflies prefer feeding on *Ailanthus altissima*, commonly known as the "Tree of Heaven." They can be found feeding on other plants and trees, but *Ailanthus altissima* is their favorite host. Here's an excellent resource to help you identify the tree:
https://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/420/420-322/420-322_pdf.pdf

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If you have *Ailanthus* on your property: please consider reducing the number of *Ailanthus* trees, then treat remaining "trap trees" with insecticides. This is a longer-lasting solution than simply spraying insects you see.
More detail about this process can be found at the following websites:

http://www.agriculture.pa.gov/Protect/PlantIndustry/spotted_lanternfly/Documents/What%20to%20do%20if%20you%20find%20spotted%20lanternfly%20on%20your%20property%20fact%20sheet%20February%202017.pdf

http://www.agriculture.pa.gov/Protect/PlantIndustry/spotted_lanternfly/Documents/Spotted%20Lanternfly%20%20Property%20Management.pdf

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If you want to kill Spotted Lanternflies without controlling *Ailanthus*:

When there are only a few insects, you can kill spotted lanternflies by swatting or crushing them. For large populations, two kinds of insecticides are widely available that will kill Spotted Lanternfly adults. **Contact insecticides** kill spotted lanternflies when the chemical contacts the insect directly. **Systemic insecticides** are absorbed by the tree and kill insects feeding on it. **ALL** insecticides must be used as directed on the label. Take the time to read the label carefully and follow the directions. This increases your safety, the safety of the environment, and the effectiveness of the insecticide.

Pennsylvania law requires that pesticide labels list the site where a pesticide (such as an insecticide) may be used. In Pennsylvania, insecticide labels do not have to specifically list the targeted insect. There are insecticides labeled for use on ornamental trees and around buildings. These products are legal to use on the sites listed in order to control Spotted Lanternflies in Pennsylvania.

Penn State Extension is currently testing to determine which insecticides are most effective in controlling adult spotted lanternflies. Preliminary results show insecticides with the active ingredients ***dinotefuran, imidacloprid, carbaryl, and bifenthrin*** are effective at controlling the spotted lanternfly. Neem oil and insecticidal soap provided some control, but results varied, and insects sometimes took several days to die.

September 2017

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Examples listed below are some of the available insecticide products containing the most effective ingredients studied (***dinotefuran, imidacloprid, carbaryl, and bifenthrin***).

EXAMPLES OF PRODUCTS CONTAINING INSECTICIDES LABELED FOR USE IN LANDSCAPES AND GARDENS:

Contact insecticides (bifenthrin, carbaryl) - apply when adult insects are present:

- AVALON INSECTICIDE
- BIFEN 7.9F SELECT
- FERTI-LOME BROAD SPECTRUM INSECTICIDE
- FLEE READY-TO-USE YARD SPRAY
- HOME MD MAXIMUM DEFENSE YARD CONCENTRATE
- LESCO CROSSCHECK PLUS MULTI INSECTICIDE
- MAXXTHOR SG
- ORTHO MAX PRO
- SEVIN
- TALSTAR SELECT INSECTICIDE
- UP-STAR GOLD INSECTICIDE

Systemic insecticides (imidacloprid, dinotefuran) – most effective when applied in spring and summer, before adults build up:

- BAYER ADVANCED 12 MONTH TREE & SHRUB INSECT CONTROL
- BONIDE ANNUAL TREE AND SHRUB INSECT CONTROL WITH SYSTEMAXX
- COMPARE-N-SAVE SYSTEMIC TREE & SHRUB INSECT DRENCH
- GREEN LIGHT TREE & SHRUB INSECT CONTROL WITH SAFARI
- MONTEREY ONCE A YEAR INSECT CONTROL II
- ORTHO BUG B GON YEAR-LONG TREE & SHRUB INSECT CONTROL CONCENTRATE
- SPECTRACIDE TREE & SHRUB INSECT CONTROL
- TRANSTECT 70 WSP INSECTICIDE
- VENOM INSECTICIDE
- ZYLAM LIQUID SYSTEMIC INSECTICIDE

EXAMPLES OF PRODUCTS CONTAINING INSECTICIDES FOR USE ON VEGETABLES, FRUIT, BERRIES AND GRAPES:

WHEN USING INSECTICIDES ON EDIBLE CROPS: It is especially important to follow directions for chemical application and timing from harvest as stated on the label.

- AGWAY COMPLETE FRUIT TREE SPRAY
- BONIDE COMPLETE FRUIT TREE SPRAY LIQUID
- BONIDE EIGHT INSECT CONTROL FLOWER &VEGETABLE ABOVE AND BELOW SOIL INSECT GRANULES
- HI-YIELD VEGETABLE & ORNAMENTAL INSECT CONTROL GRANULES
- SEVIN
- VEGETABLE GARDEN SOIL INSECTICIDE

The products listed above are registered for use in specific settings. Read the pesticide label and follow the directions, including application rates, methods, and appropriate protective clothing and equipment.

THE LIST IS PROVIDED BASED ON CURRENT PRODUCT REGISTRATIONS. THIS IS NOT AN ENDORSEMENT OF ANY PRODUCT OR PESTICIDE PRODUCER. THIS IS NOT A COMPLETE LIST OF POSSIBLE LABELED PRODUCTS OR BRANDS.

THESE INSECTICIDES HAVE NOT ALL BEEN TESTED AGAINST SPOTTED LANTERNFLY SPECIFICALLY, AND ADDITIONAL EXPERIMENTS ARE NEEDED TO DETERMINE THEIR EFFICACY.

September 2017

Insecticide Application

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Things to remember

- In PA pesticide applications are based on site location
- Pesticide efficacy are currently underway by PSU Extension
- Multiple insecticide products may be needed.
  - Systemics for long term control
  - Contact for population increase control
- Always read the label for rates and application procedures

Insecticide Application

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Not Viable Options

- The life cycle not conducive to aerial applications
- Fire and standing trees not a good combination
- Homemade mixtures

Insecticide Application

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Educate Community

- Help businesses and residents understand the need for multiple approaches
- Make sure people understand what the spotted lanternfly does not harm such as humans and pets
- Spotted lanternfly do not over-winter in houses
- Utilize licensed pesticide applicators

Spotted Lanternfly in Pennsylvania

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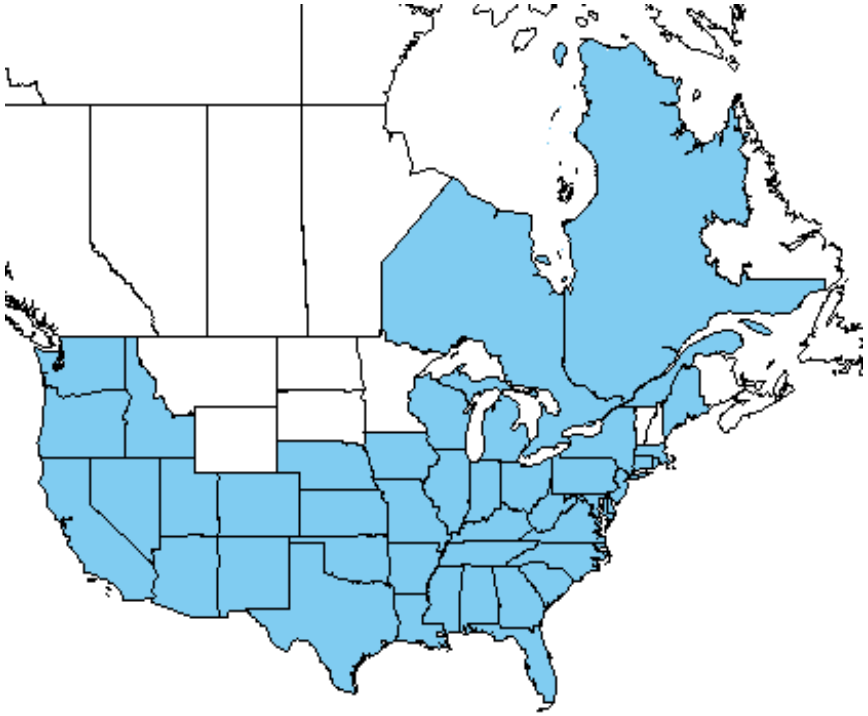
Spotted Lanternfly makes use of over 70 different plant species, but strongly prefers the invasive “Tree of Heaven”



Tree of Heaven Distribution-USDA PLANTS Database

Ailanthus

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Look Alikes

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Sumac

Black Walnut

Ailanthus Control

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- *Ailanthus altissima* or Tree of Heaven is considered an invasive weed
- Reproduces by seed and also root graft
- If not properly treated with herbicide, multiple shoots/trees can arise from one cut tree
- Treatment recommendations found on the Spotted Lanternfly webpage

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Removal-Trap Tree Method
Most Ailanthus are removed or killed with herbicide

Spotted Lanternfly in Pennsylvania

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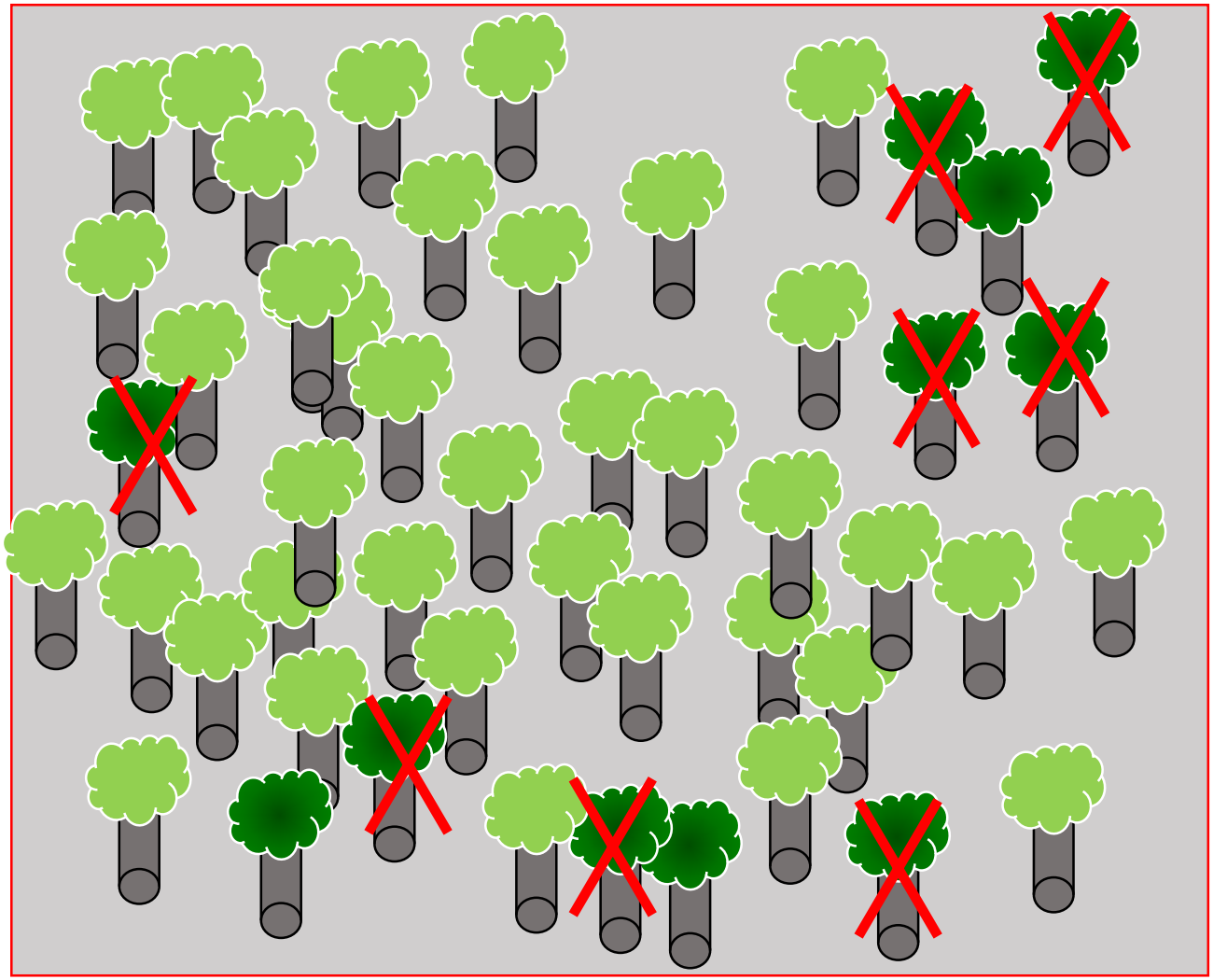

Host Reduction

Remove Most Ailanthus

Leave a few male trees and treat with systemic insecticide

Treating in May or June will also kill nymphs and will be fully integrated into tree for adult feeding.

Spotted Lanternfly in Pennsylvania

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Trap trees

July-September
4th Instar and Adults

SLFs concentrate to feed on Tree of Heaven with insecticide and die

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Impact on Adults is Dramatic

Spotted Lanternfly in Pennsylvania

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As the population of spotted lanternfly grows, and the insect adapts, new threats to multiple industries emerge

It is clear that more help is needed to contain this pest

Spotted Lanternfly in Pennsylvania

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Industries, residents, and agencies must join forces to take steps to control spotted lanternfly

Spotted Lanternfly Biosecurity

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Do your part to help contain this unwanted pest

Learn more at :

http://www.agriculture.pa.gov/spottedlanternfly

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Thank you for learning about the Spotted lanternfly and the Pennsylvania quarantine. If you are a business that moves vehicles or other regulated articles within or from a quarantine area, you need to secure a permit. Visit the website below and take the exam to qualify for permits.

https://www.surveymonkey.com/r/SLFPermitExam