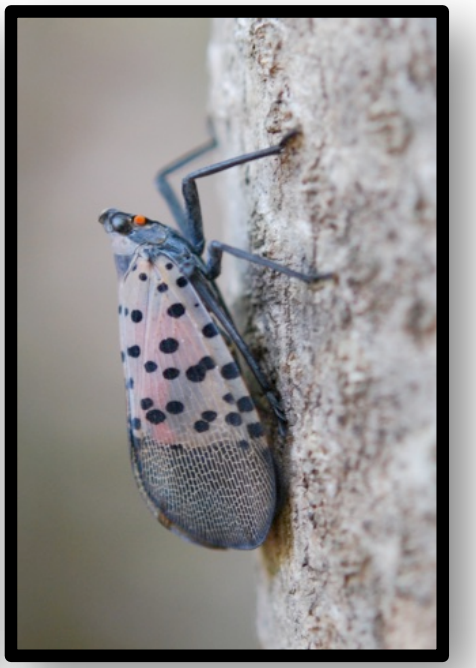
Emerging Invasive Insects In Eastern New York

ICS Full Scale Exercise

July 21st , 2015

Fire Training Center – Orange County

9 Training Center Lane, New Hampton, NY

Peter Jentsch

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Cornell University
College of Agriculture and Life Sciences

Hudson Valley Research Laboratory

Historical Invasive Insects Pests In Eastern New York

Grape berry moth, *Lobesia botrana* ([Dennis & Schiffermuller])	Tortricidae; Lepidoptera
Oriental fruit moth, *Grapholita molesta* (Busck)	Tortricidae; Lepidoptera
Apple maggot, *Rhagoletis pomonella* (Wash, 1867)	Tephritidae; Diptera
Oystershell scale, *Lepidosaphes ulmi* (Linnaeus)	Diaspididae; Hemiptera
San Jose scale, *Quadraspidiotus perniciosus* (Comstock)	Diaspididae; Hemiptera
Rose leafhopper, *Edwardsiana rosae* (Linnaeus)	Cicadellidae; Homoptera
Japanese beetle, *Popillia japonica* Newman,	Scarabaeidae; Coleoptera
Pear psylla, *Cacopsylla pyricola* Foerster,	Homoptera: Psyllidae
European red mite, *Panonychus ulmi,*	*Acari*: Tetranychidae

Historical Invasive Insects In Eastern New York

Factors Contributing to Invasive Insect Success

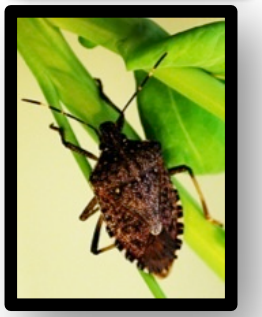
- Size of the introduced population (the larger the number, the higher the probability of establishment).
- Aggressiveness (how well it out competes native species)
- Many generations (producing high populations)
- Rapid dispersal
- Ecological niche with suitable climate and available food
- Absence natural enemy complex (parasites and predators)

Emerging Insect Problems In Eastern New York

Newly Invasive Insects Presently Causing Damage to Fruit

Spotted Wing Drosophila (SWD)
2011

- Very aggressive
- non-competitive niche
- Many hosts
- 6-13 generations / season
- Flight distribution



Brown Marmorated Stink Bug (BMSB)
1997 PA?
2008 (NY)

- Very aggressive
- Low-competitive niche
- Many hosts (arboreal)
- 1-2 generations
- Flight distribution to hosts

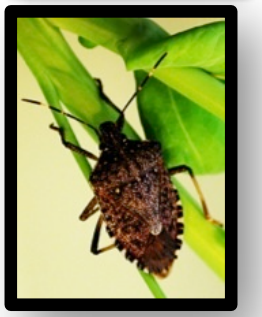
Black Stem Borer (BSB)
1932

- Opportunistic to tree stress
- Low-competitive niche
- Many hosts (arboreal)
- 2 generations
- Flight distribution to hosts

Emerging Insect Problems Eastern New York

Newly Invasive Insects Presently Causing Damage to Fruit

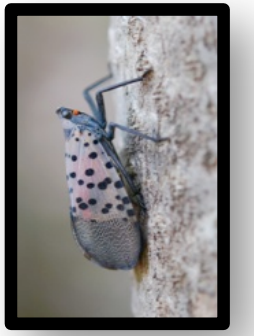
Spotted Wing Drosophila (SWD)
2011



Brown Marmorated Stink Bug (BMSB)
2008

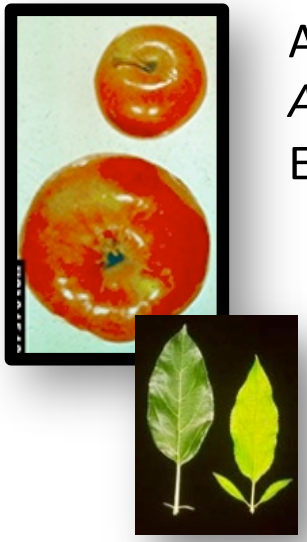
Black Stem Borer (BSB)
1932

Newly Invasive Insects & Disease with High Potential to Damage Tree Fruit



Spotted Lanternfly (SLF)
E.PA Fall 2014

High Potential to Become Invasive



Apple Proliferation Phytoplasma (APP)
Apple psylla: Candidatus Phytoplasma mali
Europe 2012

New Pest Update: Spotted Lanterfly. **Hemiptera: Fulgoridae**

- The **Spotted Lanternfly,** *Lycorma delicatula* (White), is a planthopper from Asia, specifically found in China (Anhui, Beijing, Guangdong, Hebei, Jiangsu, Shaanxi, Shandong, Shanghai, Sichuan, Tianjin, Zhejiang), Japan (at least in Honshu), Korea Republic (introduced in the 2000s and invasive), Taiwan, Vietnam. First found in Pikes County, Boyertown, PA in the fall of 2014.

Adult spotted lanternfly (*Lycorma delicatula*). Source http://hojae.net/520.

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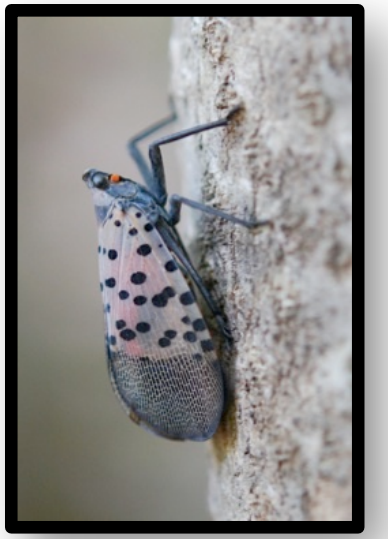
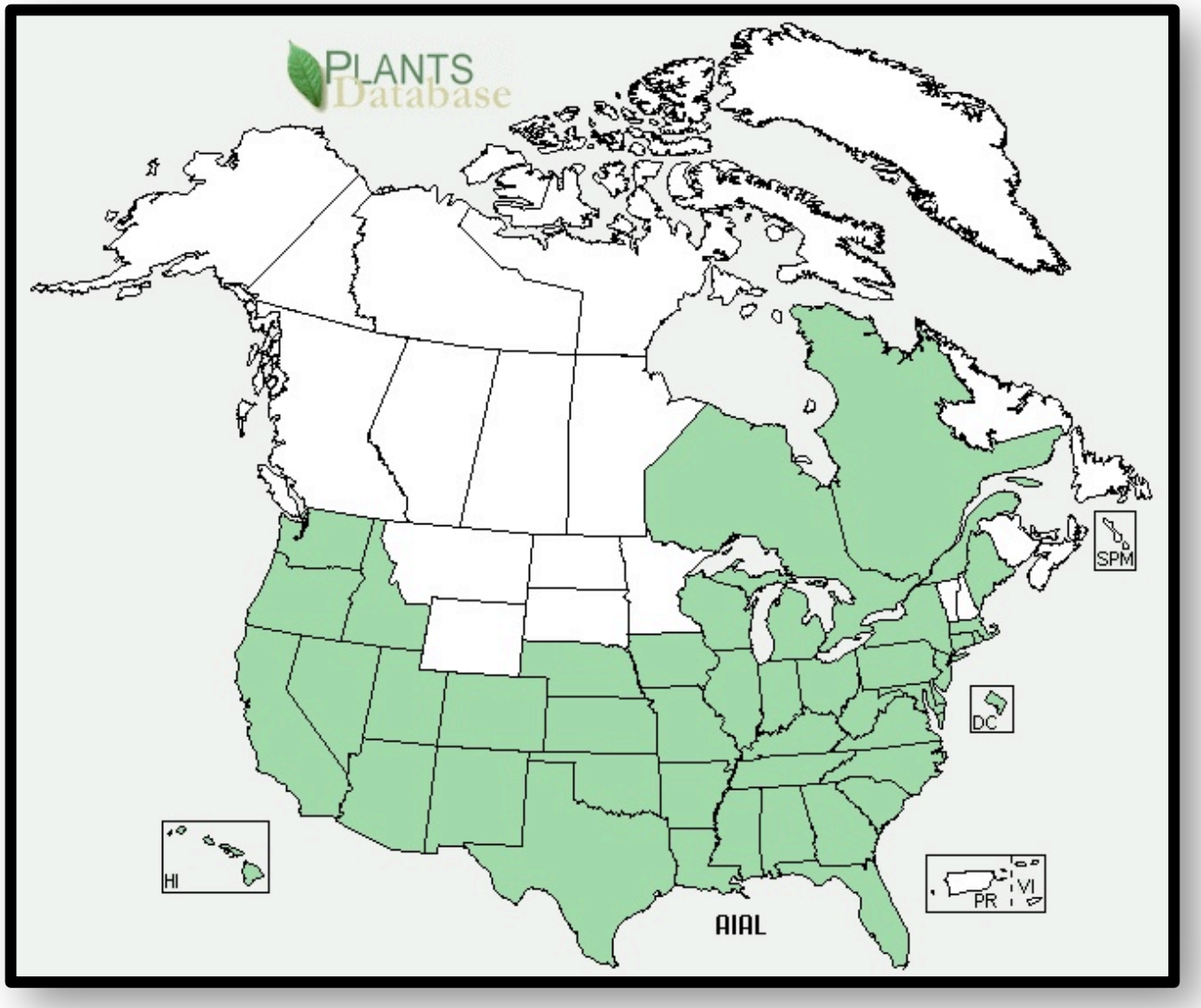
New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

- It is an invasive insect in Korea where it was introduced in 2006 and since has attacked 25 plant species.
- In the U.S. it has the potential to greatly impact >70 plant host species including grape, apple, pine and stone fruit. Feeding to grape can lead to vine mortality.
- Will feed on tree fruit. Observed on maple
- Adults appear in July & move to **Tree of Heaven** (*Ailanthus altissima*)
- SLF utilizes Tree of heaven for egg laying beginning in October.



New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Chinese Sumac, stinking shumac, copal tree, varnish tree



New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*Ailanthus altissima*); Family: Quassia Family (*Simaroubaceae*): Tropical

- Native to Asia; China, Taiwan, Korea (China to Europe – 1740s; United States in 1784.)
- Rapid growth: mature trees grow from 56’ to 90’ in height.
- A cosmopolitan urban / roadway weed tree, adaptable and pollution tolerant.
- **Intolerant of low light**
- **Highly invasive species**: prolific seed producer, grows rapidly, overruns native vegetation.
- **Produces toxins** that prevent the establishment of other plant species.
- **Spreads by seeds and root suckers**. Suckers may appear as much as 150 ft (45 m) from the trunk (Jacobson, 1996). Its root system is aggressive enough to cause damage to sewers and foundations.
- Smooth leaves have **strong unpleasant smell** when crushed

New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Resembles **Staghorn Sumac** (*Rhus typhina*).

- Leaves don't smell.
- Stems fuzzy.
- Red fuzzy fruit in compact cone shaped cluster
- Low spreading growth

New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*A. altissima*): Urban soils, railroad tracks, bridges, roadways

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New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*A. altissima*): Forest edge, thickets, stream beds, power lines, open space.

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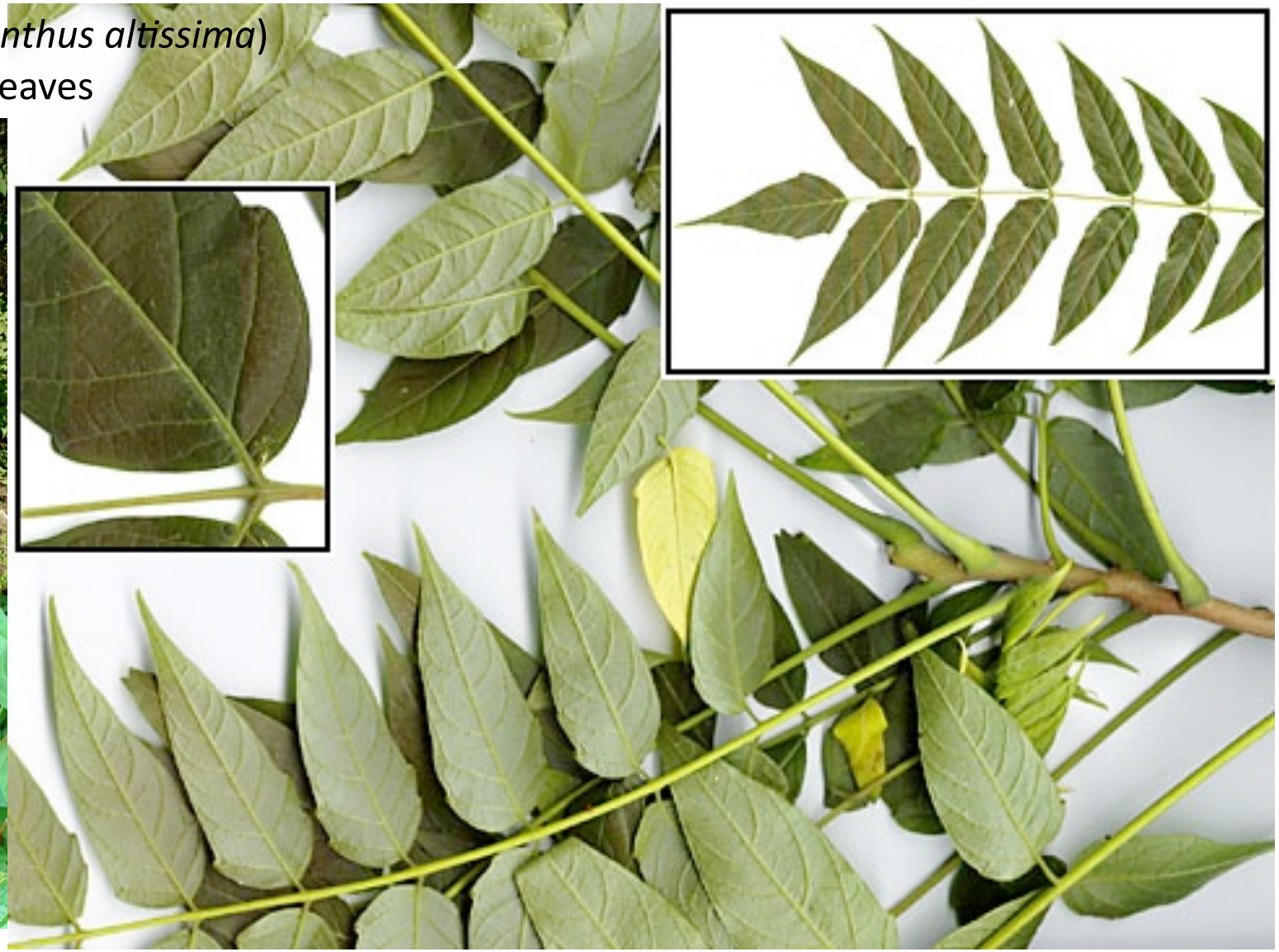
New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*Ailanthus altissima*)

- Smooth pointed leaves



New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*Ailanthus altissima*)

- Heart shaped leaf to stem attachment
- Bud along edge
- Alternate leaf stem attachment

Photo: Lawrence Barringer, PDA. Bugwood

New Pest Update: Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Bark stages of development; smooth, large lenticel, striated.

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

Dioecious - male and female trees.
Some trees have both sexes and some flowers appear bisexual (have both male and female parts).

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Tree of Heaven (*Ailanthus altissima*) (P. Mill.) Swingle

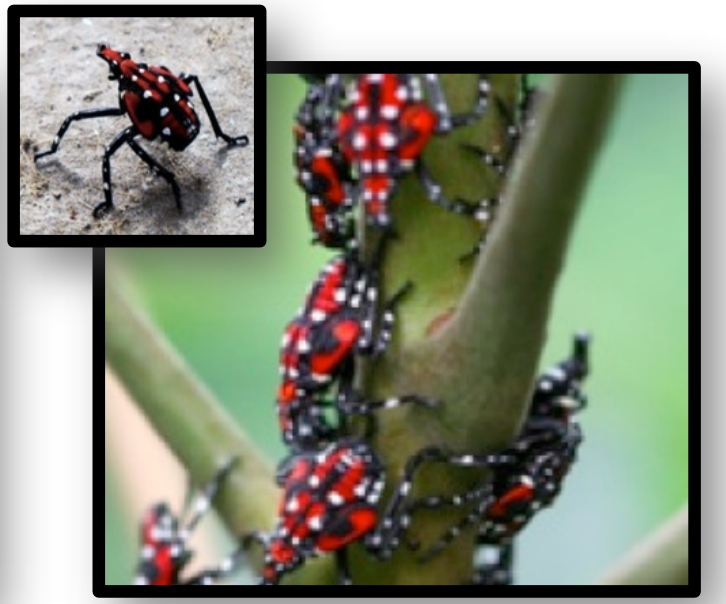
Ailanthus fruit stages of development: green in spring, yellow, orange, deep red to brown in fall

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

- Nymphs hatch from Late April to early May egg masses laid on smooth bark, stone, and other vertical surfaces. They climb, feed and fall repeatedly onto host plants.

- Nymphs complete four immature stages. The first stage is black with white spots and wingless.

- As it grows, the Spotted Lanternfly will start to develop red patches in addition to the white spots. Nymphs spread from the initial site by crawling and feeding on a variety of woody and non-woody plants.



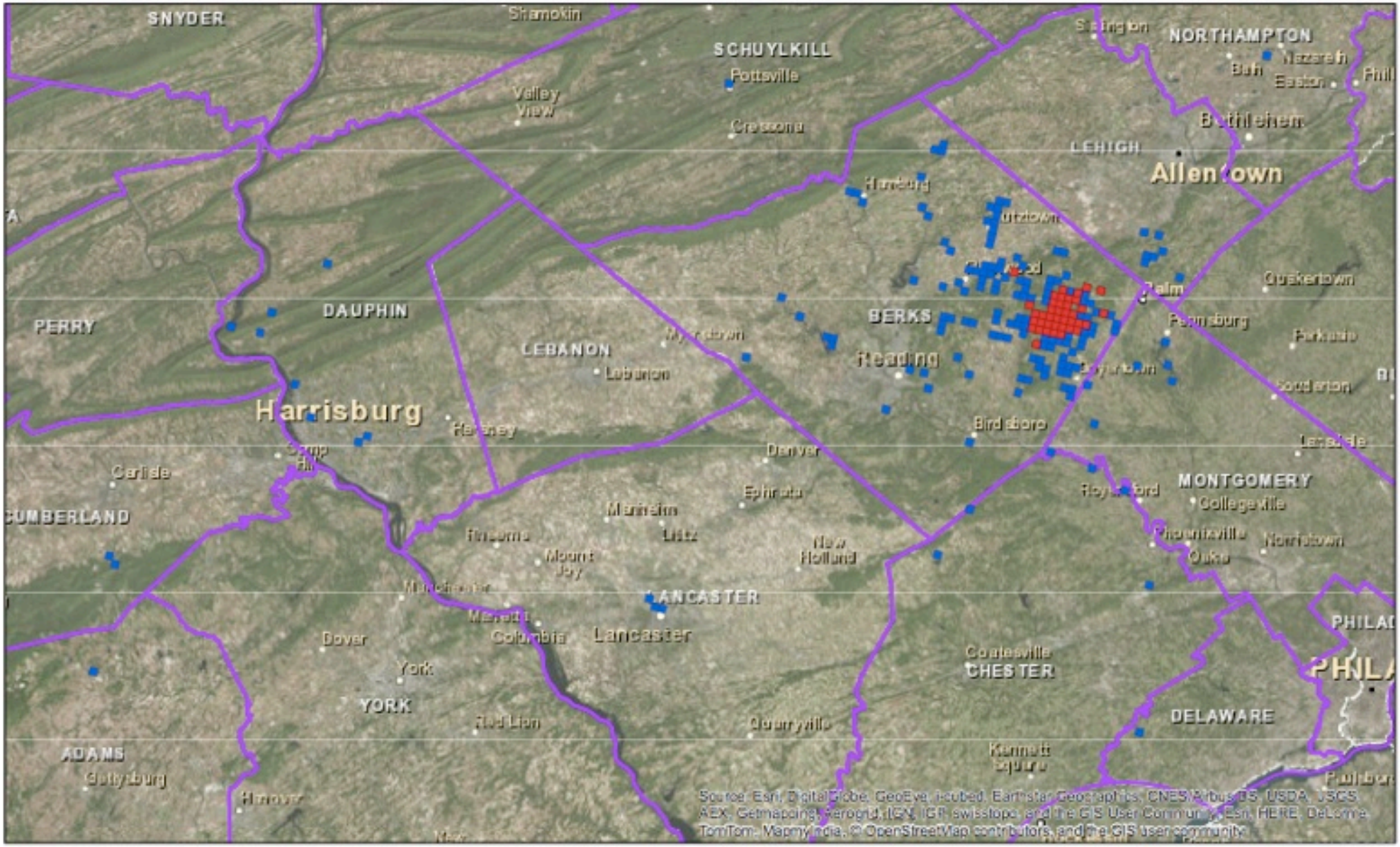
Lycorma Detection Survey

Results Through 15 December 2014

Initiated in October of 2014 to determine spread by Sven-Erik Spichiger, PDA Entomologist

Lycorma Detection Survey

Results Through 15 December 2014



Survey Grids

- Surveyed - Positive
- Surveyed - Not Found

Found SLF was limited to a small area of Eastern Berks County, Pennsylvania

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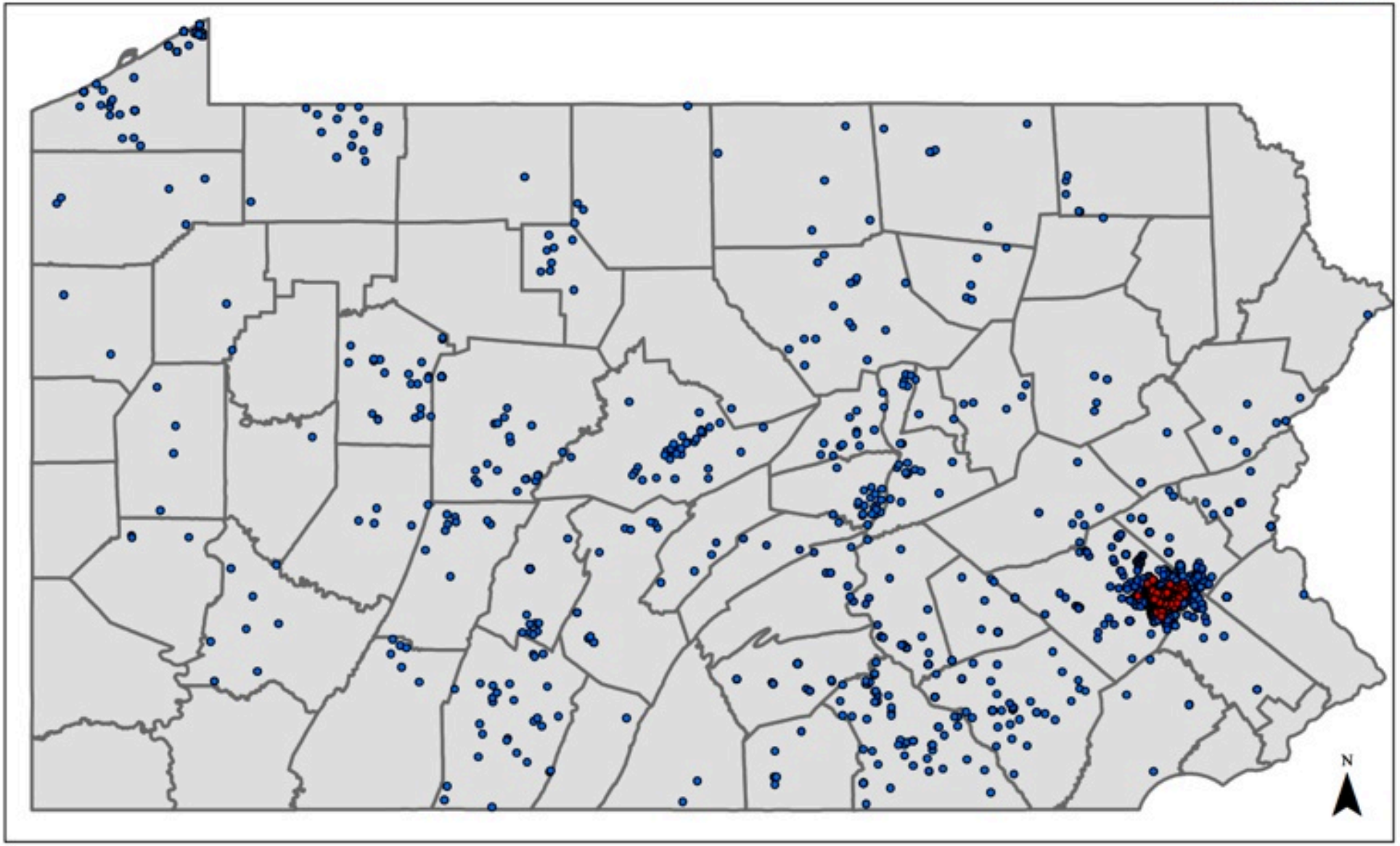
Lycorma Detection Survey

Results through 13 July 2015



Spotted Lanternfly Presence

- Present
- Not Found

Survey continued to find SLF remained limited to Eastern Berks County, Pennsylvania

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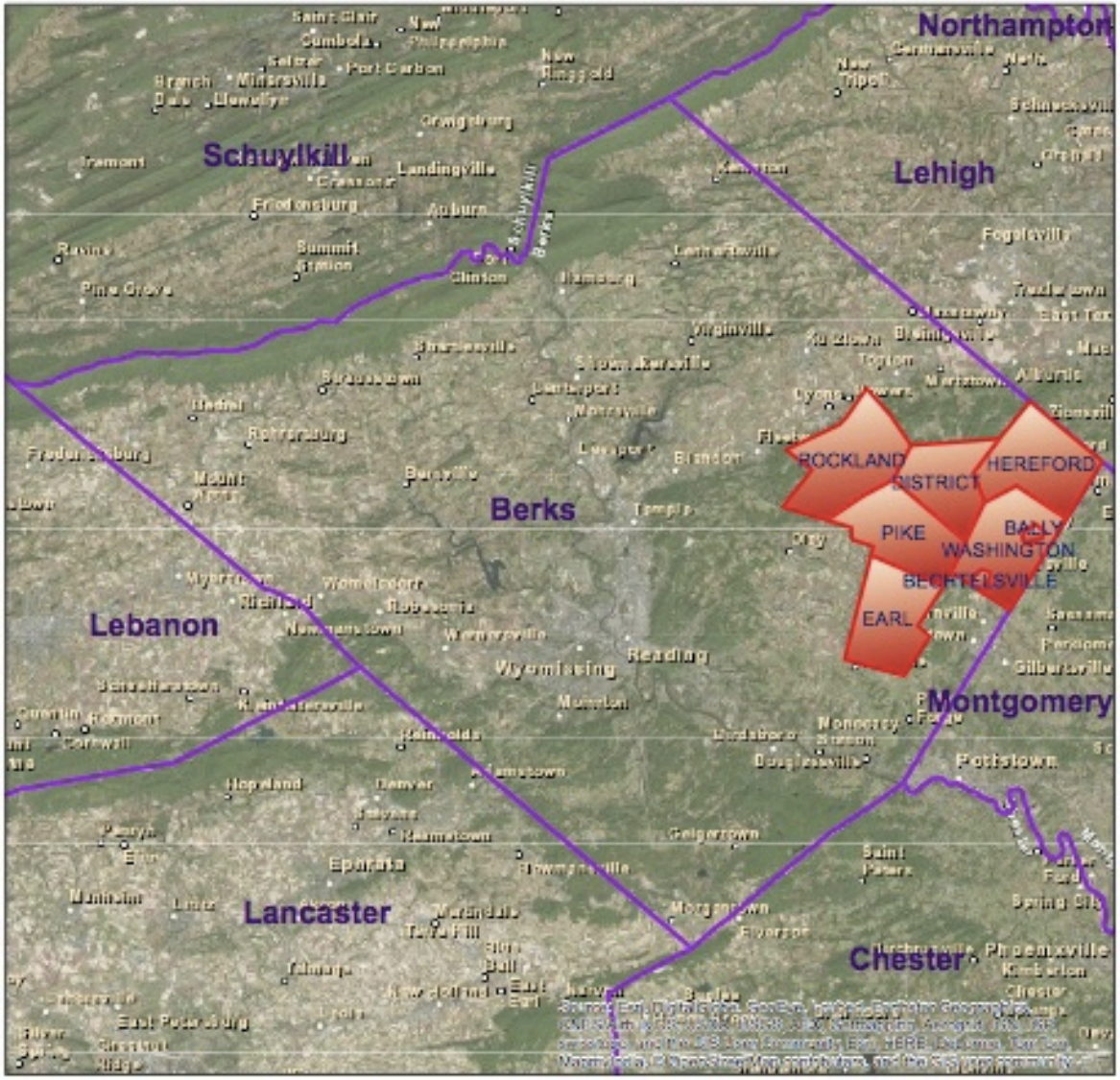
Spotted Lanternfly Quarantine Map

Townships Under Quarantine As of December 13, 2014



Legend

- Township Under PDA Quarantine
- Pennsylvania County Border

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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

- ☐ Backpacks
- ☐ Basketball backboards
- ☐ Bicycles
- ☐ Boats/Boat trailers
- ☐ Campers
- ☐ Ice chests
- ☐ Motorcycles
- ☐ Motor homes
- ☐ Recreational vehicles
- ☐ Snowmobiles
- ☐ Tarps
- ☐ Tents
- ☐ Other

Outdoor Household Items

- ☐ Barrels
- ☐ Cardboard or wooden boxes
- ☐ Outdoor poles
- ☐ Plant containers
- ☐ Firewood
- ☐ Propane or oil tanks
- ☐ Trash cans
- ☐ Refrigerators/Freezers
- ☐ Storage sheds
- ☐ Shutters
- ☐ Storm/Screen doors and windows
- ☐ Window awnings
- ☐ Outdoor furniture
- ☐ Other

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.

Building Materials

- ☐ Bricks/Cinder blocks
- ☐ Cement mixing tubs
- ☐ Lumber
- ☐ Roofing materials
- ☐ Tools and toolboxes
- ☐ Workbenches
- ☐ Skidsters/Forklifts
- ☐ Pipes
- ☐ Other

Yard and Garden Items

- ☐ Dog houses, rabbit sheds, chicken coops, etc
- ☐ Barbecue grills
- ☐ Carts
- ☐ Cold frames
- ☐ Fencing
- ☐ Garden tillers
- ☐ Yard decorations
- ☐ Garden tools
- ☐ Backhoes
- ☐ Lawnmowers
- ☐ Signs and posts
- ☐ Storage sheds
- ☐ Tractors and trailers
- ☐ Trees, shrubs and plants
- ☐ Other

Children's Playthings

- ☐ Play houses
- ☐ Kiddie pools
- ☐ Bicycles, scooters
- ☐ Sandboxes
- ☐ Other

Adult Spotted Lanternfly, present in autumn months.

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

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

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.

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Summer: Late July - August

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New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Summer: July - November

Photo: Lawrence Barringer, PDA. Bugwood

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New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Summer: Late July - August

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New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Summer: Late July - August

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New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Season: Fall to 1st freeze

Trees: *Ailanthus altissima*

- **Adult Presence = bee & wasps**
- **SLF feeding shunts excess sugar**
- **Honeydew secretions at tree base, sign of heavy infestation.**

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Season: Fall-early freeze

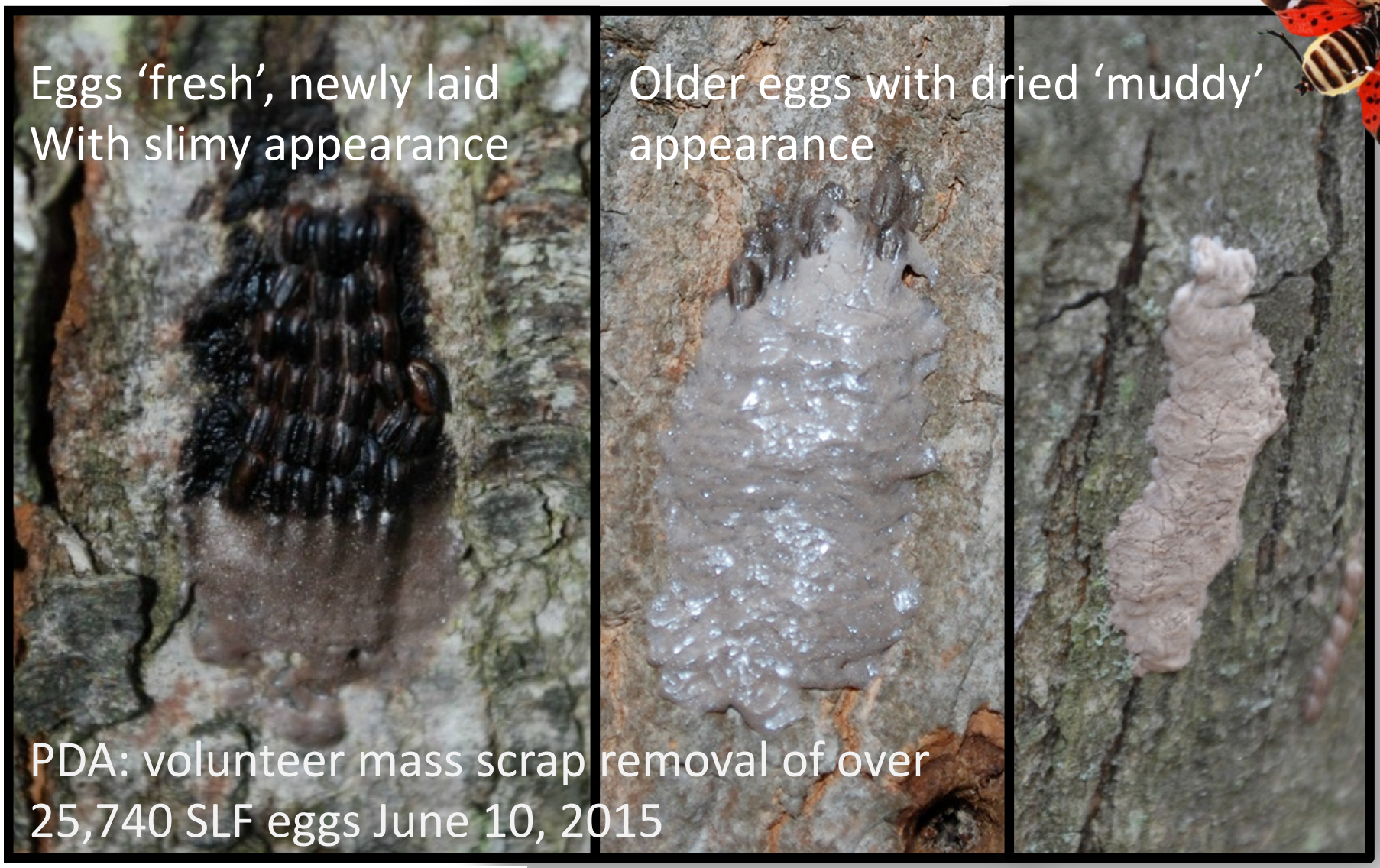
Trees: *Ailanthus altissima*

- **Heavy honeydew secretions; white mold**

Photo: Lawrence Barringer, PDA. Bugwood

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Fall (October) through Winter



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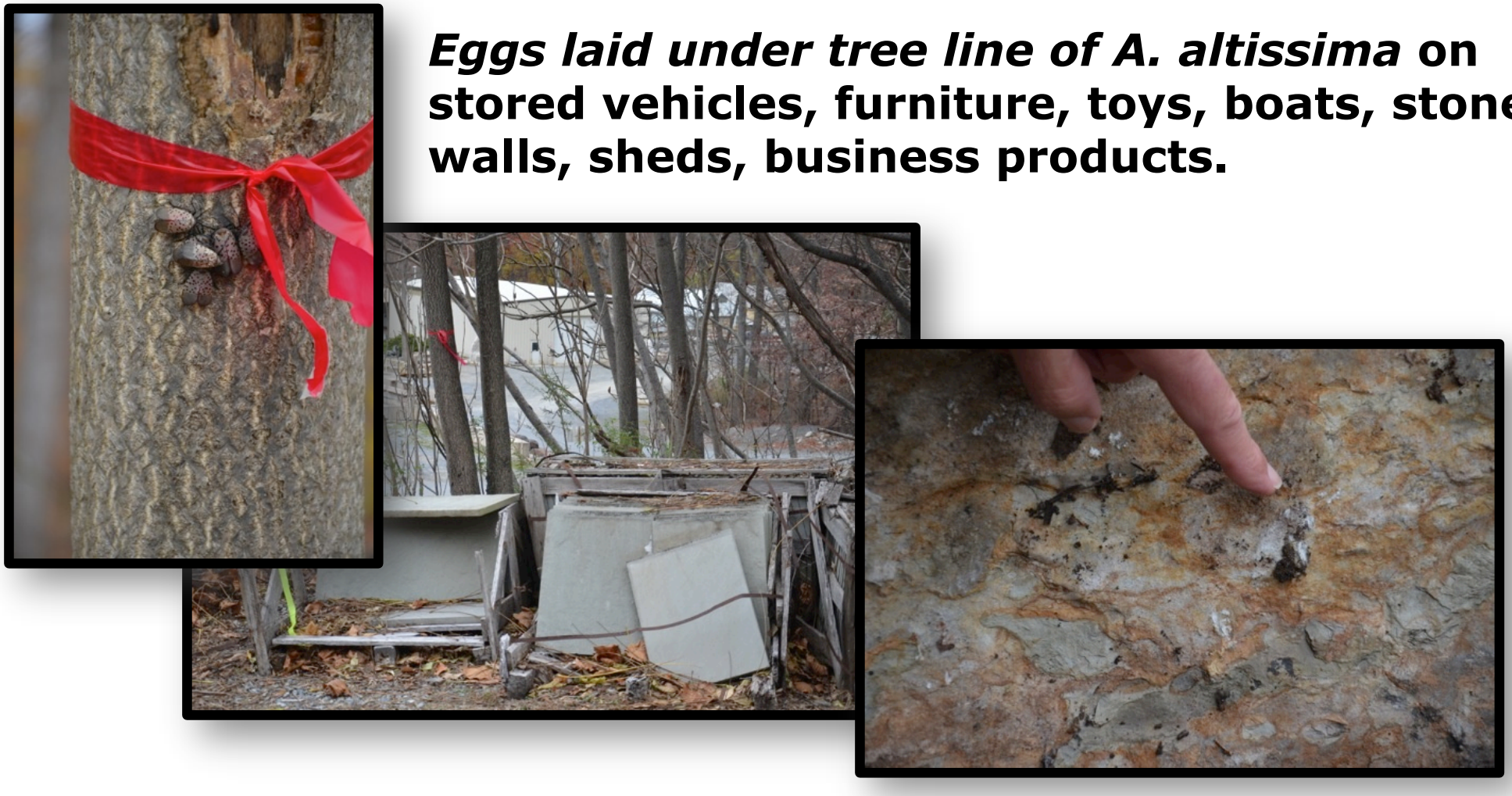
New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Fall through Winter

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Fall through Winter



***Eggs laid under tree line of A. altissima* on stored vehicles, furniture, toys, boats, stone walls, sheds, business products.**

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Late Fall through Winter

- ***Eggs on wood posts***
- ***Under bark of A. altissima***

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

Spring: Beginning late April – Late July

Nymphs emerge from egg clusters

- climb and drop; Wind borne and crawling movement to various host plants.
- Tree banding used to capture nymphs

Early-stage nymph

Late-stage nymph

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CONCLUSION

Inspecting for SLF

- Become familiar with *Ailanthus altissima* 'Tree-of-Heaven' and various plant host species
- Know the differences between Staghorn Sumac and *Ailanthus altissima*
- Determine the 'seasonality' of SLF
- Look for the obvious live insect life stages during the summer
- Look for 'left behind' signs of SLF

New Pest Update: Spotted Lanterfly. Hemiptera: Fulgoridae

CONCLUSION

Inspecting for SLF: Spring through summer

Nymphs

Early – Late stage

Hosts plants: *Ailanthus*, apples, apricots, ash, cherries, grapes, maple, nectarines, oak, peaches, pine, plums, poplar, walnut

Inspecting for SLF: Late summer - Fall

Adults

Signs of Feeding

Tree 'bleeding'

Hosts plants: *Ailanthus* only

CONCLUSION

Inspecting for SLF: Mid-Late Fall

Adults
Mold

Hosts plants: *Ailanthus* only

CONCLUSION

Inspecting for SLF: Mid-Late Fall / Winter-Spring

Adults

Eggs

Old signs of egg laying

Hosts plants: *Ailanthus*, beneath tree line of *Ailanthus*, stored vehicles, furniture, toys, boats, stone walls, sheds, business products

Thank You…Questions??