

Spotted Lanternfly Action Plan

Invasive Species Management

Prepared for:



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Acronyms

AEC	Army Environmental Command
SLF	Spotted Lanternfly
VDACS	Virginia Department of Agriculture and Consumer Services

Introduction

Spotted Lanternfly (SLF), *Lycorma delicatula*, is an invasive plant-hopping pest native to Asia that feeds on many plants, including important crops. First identified in Berks County Pennsylvania in 2014, SLF have since spread throughout southeastern Pennsylvania and have the potential to impact agricultural crops such as grapes, hops, and hardwoods. Pennsylvania state and federal agencies are working to contain the spread of SLF; however, SLF was detected in Winchester, Virginia in January 2018.

The Virginia Department of Agriculture and Consumer Services (VDACS) established the Spotted Lanternfly Quarantine for Frederick County and the City of Winchester on 28 May 2019 to slow the spread of SLF to uninfected areas of the state. This quarantine requires businesses to obtain a permit from VDACS and inspect any items deemed high risk for SLF movement by VDACS.

Identification and Life Cycle

Each year one generation of SLF is produced. Eggs are laid on hard surfaces (i.e. trees, rocks, houses, outdoor equipment, etc.) in the fall and hatch in the spring. Egg masses are covered in a mud-like substance to protect them and each mass contains 30 to 50 eggs (Figure 1).



Figure 1. Spotted Lanternfly Egg Mass

After hatching, SLF go through four nymph (instar) phases. The first three instar phases appear black with white spots, while the fourth instar phase appears red with white spots and black stripes. First and third instar phases appear identical, but vary slightly in size. Figures 2 and 3 show the difference between the first three instar phases and the fourth.



Figure 2. 1st-3rd Instar of the Spotted Lanternfly



Figure 3. 4th Instar of the Spotted Lanternfly

SLF adults emerge in July and are active until winter. SLF adults are large (approximately 1 inch) and highly mobile, making this the easiest phase to identify. Adults have black bodies with brightly colored wings. SLF are better at jumping or hopping than flying, so their wings are more often closed. SLF wings are grey with black spots and, when fully opened, have bright red markings. Photos of SLF adults can be seen in Figures 4 and 5.



Figure 4. Spotted Lanternfly Adult, Wings Closed



Figure 5. Spotted Lanternfly Adult, Wings Open

Figure 6 illustrates the complete life cycle of the SLF compared to the time of year.

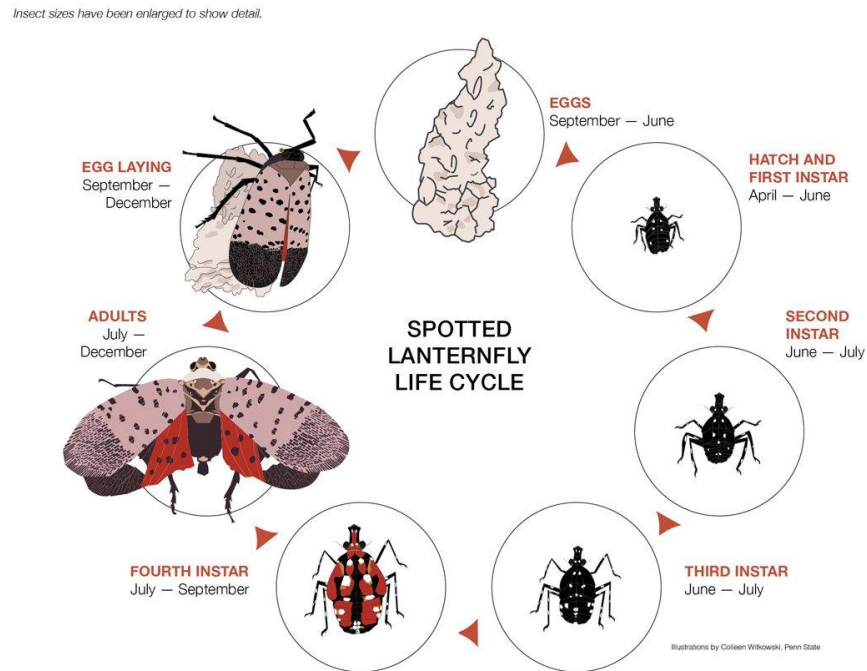


Figure 6. Spotted Lanternfly Life Cycle

Host Plant

While SLF will infest many different tree species, SLF's preferred host is tree-of-heaven (*Ailanthus altissima*). Tree-of-heaven, native to Taiwan and central China, was introduced to North America in the late 1700s as an ornamental. First imported to Pennsylvania in 1784, tree-of-heaven was commercially available in nurseries by 1840 and was often used in urban forestry.

Currently tree-of-heaven is a widespread invasive species in the northeastern United States and California. Fort Belvoir has had a tree-of-heaven population for as long as the federal government has owned the property. Various projects throughout Fort Belvoir's history have attempted to reduce the tree-of-heaven population with generally positive results.

Current Invasive Status

Since its discovery in Pennsylvania in 2014, the Pennsylvania Department of Agriculture has established a quarantine area with the intention of preventing the spread of SLF (Figure 7). Pennsylvania is also requiring businesses who move vehicles or products within or out of the quarantine area to obtain a SLF permit. This permit requires the completion of a SLF training program, which includes identification and procedures to follow if SLF is found.

After SLF was found in Winchester, Virginia, VDACS established a quarantine zone for Frederick County and the City of Winchester (Figure 7). Businesses within the quarantine zone are required to obtain a SLF permit from VDACS which also includes a training similar to what the Pennsylvania Department of Agriculture requires.

Currently, SLF populations are known to be established in Pennsylvania, New Jersey, Delaware, and northern Virginia. VDACS has identified that a SLF infestation poses a threat to Virginia's peach, apple, grape, and wine industries. The Pennsylvania State University Extension is leading SLF research in the affected states.

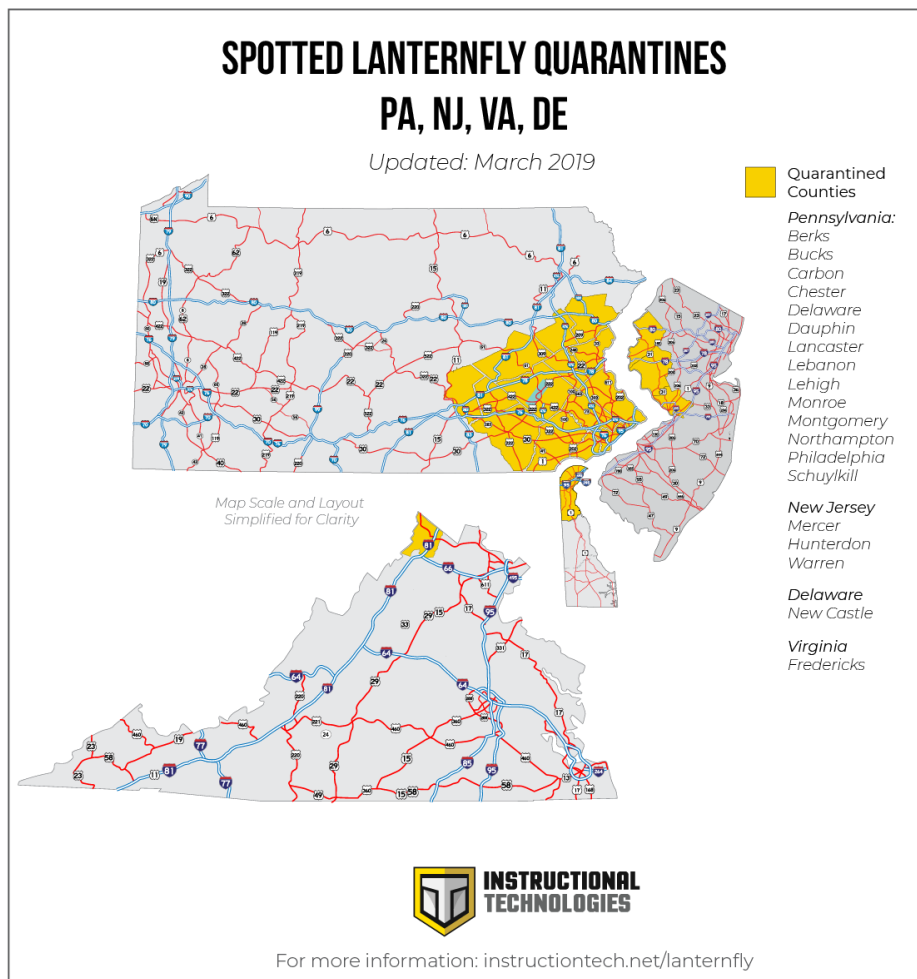


Figure 7. Spotted Lanternfly Quarantine Areas

Environmental Monitoring

DPW Environmental staff is trained in SLF identification and is monitoring the spread of SLF closely. Staff members keep a close eye on media reports and receive regular updates from various professional groups and local agencies. Additionally, installation populations of tree-of-heaven and other tree species are closely monitored for evidence of SLF infestation. Any suspicions of SLF infestation are reported to the installation forester and pest manager for verification.

Ongoing Management

Currently there is no known population of SLF on Fort Belvoir. However, SLF have been detected in similar habitat northwest of the installation and tree-of-heaven, SLF's preferred host plant, is present. These factors indicate Fort Belvoir's risk to SLF infestation if the pests were to be transported to the area.

DPW Environmental has been removing tree-of-heaven on the installation by tree removal and herbicide spraying. However, approximately four clusters of tree-of-heaven have been left in various locations across the installation to act as bait trees. If SLF are transported to Fort Belvoir, these bait trees will be the first to be infested, making their detection easier for DPW Environmental. Bait trees are checked periodically for evidence of SLF infestation.

Planned Actions if Detected

If SLF is detected on Fort Belvoir, DPW Environmental will take all necessary actions to contain the infestation and limit the spread of SLF. The following steps will be taken as soon as SLF is detected on Fort Belvoir:

1. SLF evidence will be reported to the Army Environmental Command (AEC) Pest Management Supervisor and Fairfax County Virginia Cooperative Extension Office. A full treatment plan will be developed with their guidance, which will consider all conditions specific to the infestation.
2. All trees affected by SLF will be checked for egg masses before chemical treatment begins. Any egg masses discovered will be scrapped into an alcohol solution in a closed container and disposed of in the container.
3. A pesticide and herbicide treatment plan will be executed in coordination with all appropriate agencies based on current recommendations.
4. The infested area will be monitored regularly to determine the success of the chosen management strategies. Management strategies will be adapted as necessary.

AEC, the Virginia Cooperative Extension Office, and all other appropriate agencies will be coordinated with throughout the management process. Research is still being conducted on the most effective pesticide treatment for SLF. Specific insecticides and herbicides will be selected based on current recommendations and industry guidance.

Public Involvement

Public awareness of this pest species is critical to its early detection should it spread to Fort Belvoir or the surrounding area. In order to educate the public, information will be shared with the public as it is made available. Information will be shared via newspaper articles, social media, and environmental education programming when appropriate and will include SLF identification, removal, and reporting.

Conclusions

Fort Belvoir is committed to preventing the spread of SLF into Northern Virginia. This Action Plan serves as a starting guide for installation staff in the event SLF is detected on Fort Belvoir. Preventing the spread of SLF not only protects Virginia's agricultural industry, but also prevents the degradation of installation resources. These resources, such as healthy forested land, are necessary to provide high quality training grounds for units and valuable recreational areas for soldiers and their families.

References

- Pennsylvania Department of Agriculture. (n.d.). *Guidelines for the Control of Spotted Lanternfly*. Retrieved from Pennsylvania Department of Agriculture: https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/Documents/Spotted%20Lanternfly%20%20Property%20Management.pdf
- Pennsylvania Department of Agriculture. (n.d.). *Quarantine*. Retrieved from Pennsylvania Department of Agriculture: https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/quarantine/Pages/default.aspx
- Pennsylvania Department of Agriculture. (n.d.). *Spotted Lanternfly*. Retrieved from Pennsylvania Department of Agriculture: https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/Pages/default.aspx
- Pennsylvania State University. (2019, March 18). *Spotted Lanternfly Management for Homeowners*. Retrieved from PennState Extension: <https://extension.psu.edu/spotted-lanternfly-management-for-homeowners>
- Pennsylvania State University Extension. (2019, January 11). *Updated Insecticide Recommendation for Spotted Lanternfly on Grape*. Retrieved from PennState Extension: <https://extension.psu.edu/updated-insecticide-recommendations-for-spotted-lanternfly-on-grape>
- US Forestry Service. (n.d.). *Fire Effects Information System*. Retrieved from *Ailanthus altissima*: <https://www.fs.fed.us/database/feis/plants/tree/ailalt/all.html>
- Virginia Department of Agriculture and Consumer Services. (2019, May 28). *Quarantine for Spotted Lanternfly Goes into Effect*. Retrieved from Virginia Department of Agriculture and Consumer Services: <https://www.vdacs.virginia.gov/press-releases-190528-spotted-lanternfly.shtml>