

What the 2022 Spotted Lantern Fly Detection Means for NC Grape Growers

Current Situation

In late June 2022, the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) announced¹ that it had detected a population of spotted lanternfly (SLF; *Lycorma delicatula*) in the Kernersville, NC area. SLF is native to southeast Asia, and was introduced into eastern Pennsylvania in 2014, likely from egg masses attached to imported goods. Since then, SLF has continued to spread across the eastern US (Fig. 1A), and with the NC detection (Fig. 1B) it is now present in 11 states (MA, NY, OH, IN, NJ, DE, MD, VA, WV, and NC).

The population in NC appears to be limited to a 5 square-mile area, and it is estimated to have been present for several years prior to the recent

detection. Currently, the NCDA&CS – Plant Industry Division, North Carolina Forest Service, and the US Department of Agriculture are all working together to implement a control program for the detected SLF population. This includes thoroughly surveying the area for SLF and Tree of Heaven (TOH; *Ailanthus altissima*), an invasive plant species that is known to act as a preferred host. Once found, the team is either treating TOH with a systemic insecticide that will affect SLF when it feeds, applying a contact insecticide to high numbers of easy-to-reach SLF, or removing the TOH altogether. Plant Industry Division will continuously monitor the SLF population to reduce any spread and to better understand how this pest will survive the NC winters.

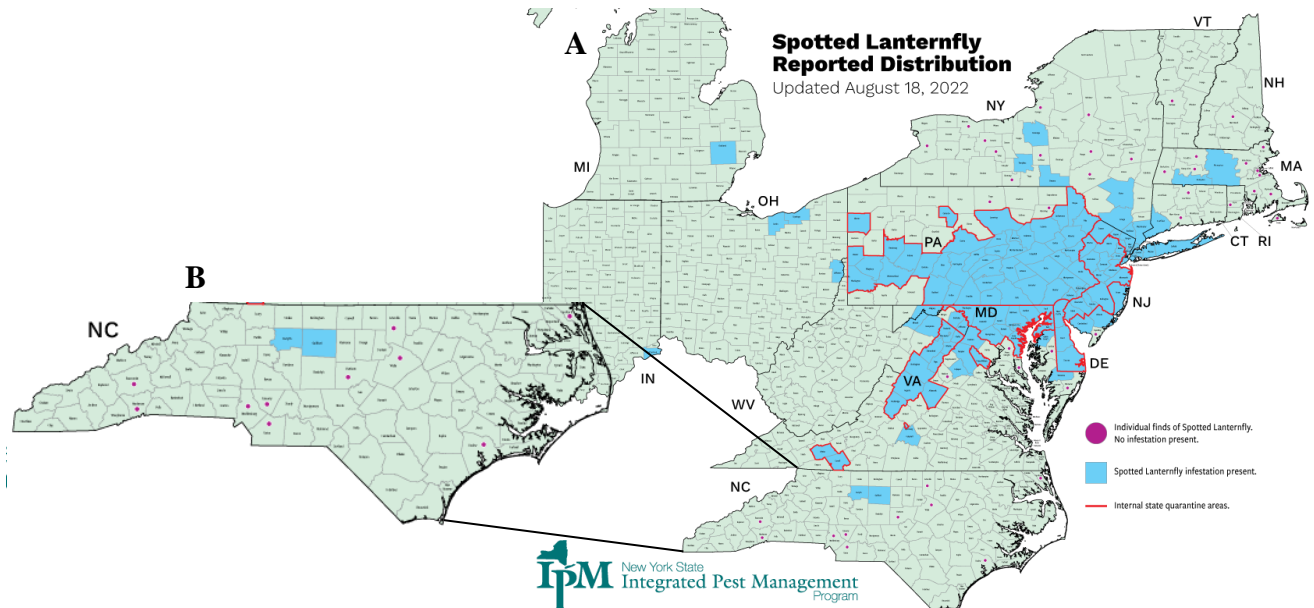


Figure 1. Map of SLF detection across the eastern US (A) and where the infestation in NC is located (B). Maps were retrieved from the StopSLF website².

Potential Threat to Grapes and Other Plants

SLF can feed on over 100 different plant species³, including many of NC's iconic native trees such as dogwood, maple, walnut, and oak. The pest poses a threat to numerous ornamental trees and several fruit crops. Grapes are perhaps of greatest concern, because of they are highly attractive and

Life Cycle and Phenology

SLF is thought to have one generation per year based on research in PA, but studies will need to be conducted to confirm the same is true in NC. It overwinters in the egg stage, with nymphs emerging from eggs in the spring or early summer, and then completing four instars before maturing into adults in the late summer (Fig. 2).

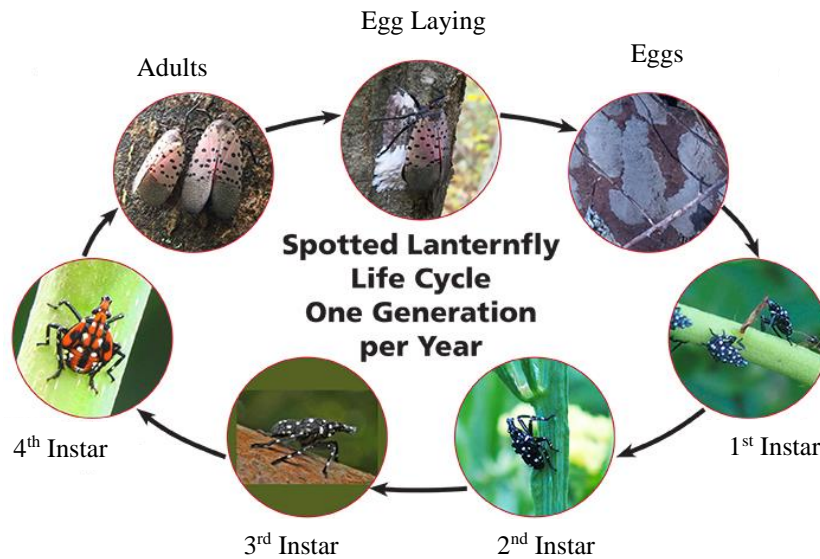


Figure 2. Spotted Lanternfly life cycle including images of each life stage. Figure is modified from Cornell IPM Fact Sheet.⁵

susceptible to feeding by SLF adults and nymphs. The insect uses its piercing-sucking mouthparts to feed on the plant's phloem – the vascular tissue of plants responsible for transporting nutrients. In addition to affecting overall plant health and reductions in sugar content, yield reductions of up to 90% have been observed under high population pressure.⁴

Of further concern, SLF forms large aggregations on plants. As they feed, they excrete large amounts of honeydew (excessive sugars and water) that can block photosynthesis, serve as a substrate for growth of sooty mold fungi, and attract ants, wasps, and bees.

Adults will then lay eggs in the fall, which will hatch the following spring and start the cycle over again. This year, NC reported earlier adult sightings than any other state; further research will be needed to better understand SLF phenology in the southeast.

Egg masses can be very hard to detect (Fig. 3), and adults prefer to lay them on hard surfaces in protected areas, including on trees, stones, outdoor furniture, and even vehicles. Consequently, they can readily hitchhike on cars, trucks, trains, etc., and spread to new areas. If you are in an area where SLF populations are known to occur, be sure to check your belongings and vehicles before traveling. Within vineyards, egg



Figure 3. Spotted Lanternfly egg mass on a piece of bark. Photo credit: Sara Lalk.

masses are known to occur in clumps on the undersides of vines and posts, including nongalvanized metal posts⁷.

Management in Vineyards

In PA, SLF infestations in grapes typically occur later in the season when late-instar nymphs and first-generation adults disperse from wooded habitats into vineyards⁶. While small nymphs may immigrate into vineyards in summer months, they do minimal harm and do not warrant insecticide sprays. In PA, late-instars and adults start to appear in vineyards in August, but high populations are not observed until mid to late September. There is also a strong edge effect in vineyards, with the majority of the population occurring within the first 50 feet of the vineyard edge.

When insecticidal control is warranted, those products that are most effective include the

neonicotinoids Actara (thiamethoxam), Scorpion (dinotefuran) and Admire Pro (imidacloprid); the pyrethroids Brigade (bifenthrin) and Mustang Max (zeta-cypermethrin); and the carbamate Sevin (carbaryl).

Other Control Measures

If you see SLF egg masses, nymphs, or adults, report the sighting immediately to the NCDA&CS using their online form, [here](#)⁸. To limit the potential for establishment of a new population in your area, it is important to act quickly as soon as SLF is detected. There are several measures growers, homeowners, landowners, and property managers can take once SLF is detected, including:

1. Remove alternative hosts, especially TOH. Herbicides should be used to kill TOH, because new plants will sprout from living roots and stumps;
2. Use exclusion netting to protect grape vines or other plants of concern;
3. Place traps, such as circle traps or sticky tapes, on nearby trees that are alternative hosts;
4. Destroy any detected egg masses, either by smashing or placing in rubbing alcohol.

And finally, when these other measures are not effective at preventing establishment, or if the population is high, insecticides should be considered. If you are using insecticides remember to follow the label, as the label is the law.

Acknowledgements and Reference

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Referenced Resources:

1. NCDA Announcement: <https://www.ncagr.gov/paffairs/release/2022/6-22SLFForsythCo.htm>
2. Stop SLF webpage: <https://www.stopslf.org/>
3. List of SLF Host Plants: <https://academic.oup.com/ee/article/49/5/999/5892805>
4. Ask an Expert – Dr. Kelly Oten: <https://cnr.ncsu.edu/news/2022/03/ask-an-expert-how-dangerous-is-the-spotted-lanternfly-to-north-carolina/>
5. Cornell CALS IPM Page: <https://nysipm.cornell.edu/environment/invasive-species-exotic-pests/spotted-lanternfly/spotted-lanternfly-ipm/biology-life-cycle-identification-and-dispersion/>
6. Penn State Extension – SLF Management in Vineyards: <https://extension.psu.edu/spotted-lanternfly-management-in-vineyards>
7. Penn State Extension – SLF Management Guide: <https://extension.psu.edu/spotted-lanternfly-management-guide>
8. NCDA Reporting Form: <https://www.ncagr.gov/plantindustry/Plant/entomology/SLF.htm>

Other Resources:

- Spotted Lanternfly Resources: <https://gardening.ces.ncsu.edu/spotted-lanternfly-resource-page/>
- Spotted Lanternfly – Invasive Forest Pests: <https://content.ces.ncsu.edu/spotted-lanternfly>
- Spotted Lanternfly Confirmed in NC: <https://forestry.ces.ncsu.edu/2022/06/spotted-lanternfly-confirmed-in-north-carolina/>
- Spotted Lanternfly and NC Field Crops: <https://ipm.ces.ncsu.edu/2022/07/will-spotted-lanternfly-be-a-major-issue-in-north-carolina-field-crops/>
- Evaluation of Insecticides for Control of SLF: <https://www.sciencedirect.com/science/article/abs/pii/S0261219419301735?via%3Dihub#!>