



Spotted Lanternfly in Virginia Vineyards: *Lycorma delicatula* (White)

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Origin & Distribution

After several years of continuous spread in Pennsylvania, spotted lanternfly (SLF; Fig. 1) was first found in Winchester Virginia in January 2018. The initial infestation zone (Spring 2018) included about 1 square mile; by November 2018 SLF had expanded its range to about 18 square miles. It is highly invasive and spreads rapidly when introduced into new areas. This is attributed to its wide host range (more than 70 host plant species) and a lack of effective natural enemies. SLF is now established throughout the Shenandoah Valley and parts of the Piedmont. Natural spread is estimated to be about 10 miles per year; there is great risk of spread by hitch-hiking on vehicles.



Figure 1. Spotted lanternfly nymphs (left and middle) and adults (right) (Doug Pfeiffer, Virginia Tech).

Description

The first three nymphal stages are black with white spots on the body and legs. The fourth and final nymphal stage is mostly bright red, with black and white markings. All nymphal stages are active hoppers.

Adult SLF are approximately 1" long and ½" wide. Its forewings are light-brown/grey with black spots and the wings tips are reticulated black rectangular blocks outlined in grey. The hind wings are marked with scarlet red with black spots.

SLF egg masses contain 30-50 eggs, are 1-1.5" long and ½-¾" wide, grayish-brown in color, and covered with a grey, waxy coating (newly laid masses are somewhat shiny).

Life Cycle

SLF has one generation and overwinters as eggs. Eggs hatch in late April-early May. Nymphs develop until adults appear in July, becoming abundant in August. Adults begin laying eggs in mid-September and continue until winter begins to kill off any remaining adults. For a life cycle calendar for our area, [see this link](#).

Signs and Symptoms

Nymph and adult SLF typically gather in large numbers on host plants, including tree-of heaven (TOH) and grapevines (Fig. 2). Adult SLF are found on tree trunks, stems, and sometimes near leaf litter at the tree base. They can fly and can disperse among host plants by walking.



Figure 2. Spotted lanternfly nymphs on a grapevine in Virginia.

While more than 70 host plants are attacked, grape is the crop at greatest risk. In the fall, adult SLF focus on TOH as a host for feeding and egg laying,

although not exclusively. Adults will lay eggs on other smooth-trunked trees or any smooth surface, natural or manmade.

Both nymphs and adults are phloem feeders — they suck sap from young stems and leaves, which can cause withering of whole trees. This reduces photosynthesis, weakens the plant, and eventually contributes to the host plant's death. If the vine is not killed outright, winter mortality is increased. Feeding can also cause the plant to weep or ooze, resulting in a fermented odor. Wounds will leave a grayish-black trail along the trunk.

The insects excrete large amounts of a sugar-rich fluid called “honeydew”, covering the stems and leaves of trees as well as the ground beneath infested plants. This supports the growth of sooty mold that can reduce photosynthesis and weaken the plant.

Impact in Vineyards

To date, our knowledge of impact in vineyards is based on experience in Pennsylvania, where yield reductions of 80-90% have been reported from current year feeding once populations become established. Heavy feeding has resulted in death of vines, with surviving vines failing to set fruit. Insecticide applications in affected vineyards increased from 4.2 applications in 2016 to 14.0 in 2018 (insecticide costs increasing from \$54.63/acre in 2016, to \$147.85/acre in 2018). Each of these vineyards reported spraying an insecticide every 3-5 days during peak SLF activity.

Quarantine & Status

SLF can readily hitchhike on human conveyances, such as motor vehicles or trains. This would enable rapid movement of hundreds of miles, a much faster spread than possible naturally. To limit such spread, Virginia Department of Agriculture and Consumer Services (VDACS) has recently expanded an existing quarantine zone; the zone now includes Albemarle, Augusta, Carroll, Clarke, Frederick, Page, Prince William, Rockbridge, Rockingham, Shenandoah, Warren and Wythe Counties, and the Cities of Buena Vista, Charlottesville, Harrisonburg, Lexington, Lynchburg, Manassas, Manassas Park, Staunton, Waynesboro and Winchester. Businesses must inspect plants and plant products, vehicles and equipment that have been outside before they are moved from the quarantine zone. Spotted Lanternfly Permits from VDACS are required to move

regulated items outside of the quarantine areas. Successful completion of the [Spotted Lanternfly Quarantine Training program](#) is necessary to apply to VDACS for a Spotted Lanternfly Permit.

Management Approaches

An eradication program managed by VDACS should lead to lowered local populations. The components of this program include a trap-tree approach, vehicle inspection, tree-banding and egg scraping.

Chemical Control It is likely that individual vineyards will need insecticide applications targeted against SLF, especially once adults become active. Consult the Virginia Cooperative Extension (VCE) [Pest Management Guide](#) for effective insecticides. Pennsylvania research has indicated that border row sprays (the edge 50') may be as effective as spraying the entire block. When populations have become established locally, repeated applications may be necessary. While resistance will be slowed with only a single generation, and many immigrants from outside the vineyard, it is still wise to rotate modes of action.

Insecticides (E = Excellent, G = Good) Pyrethroids: Brigade (bifenthrin) (E), Mustang Maxx (zeta-cypermethrin) (G), Danitol (fenpropathrin). Neonicotinoids: Actara (thiamethoxam) (E), Scorpion (dinotefuran) (E), Admire Pro (imidacloprid) (G). Carbamates: Sevin (carbaryl) (G).

Cultural Control Numbers may be reduced locally by removal of most TOH in a trap tree approach. Trees less than 6 in DBH should be killed by slashing and treating with a herbicide. This may be done by a professional. Larger trees are treated with dinotefuran to kill returning SLF. During winter, eggs found in the vineyard should be destroyed to lower populations of nymphs in the following season, or a spray directed to recently emerged nymphs in May.

Mechanical Control Netting may prevent large numbers of adults from establishing on vines. Mesh may need to be a little smaller than with bird control. Netting may need to include more of the trunk, and edges closed at the bottom.

Biological Control There are no effective natural enemies available at this time.

Additional Information and Reporting SLF

Various resources on SLF, the quarantine zone and training are posted by [VCE](#) and [VDACS](#), and in the [Virginia Fruit web site](#). If found in vineyards, you may contact Doug Pfeiffer (dgpfeiff@vt.edu), Eric Day (idlab@vt.edu), and your [local Virginia Cooperative Extension office](#).

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