**The Spotted Lantern Fly Epidemic**

**Team:** Team 003 **Client(s):** Cornell CALS Extension / E&J Gallo Winery / National Grape

**Problem statement**

Vineyards across the United States are plagued by spotted lantern fly infestations, which, according to the Cornell Chronicle can cause up to $8.8 million in damages per vineyard over 3 years of infestation due to vine death, reduced fruit quality, and product contamination. There is currently no available mechanical system that draws the SLFs on or near grapevines during the harvest window away from vines and concentrates them into a controlled location where they can be removed or contained.

**Why does it matter to the end user?**

During harvest, bugs on the vines are collected with the fruit but only a small amount of SLFs can contaminate an entire load. At that point pesticides cannot be used and hand removal is unrealistic. A system that removes SLFs in this window would reduce rejected loads and not change harvest operations.

**Proposed direction(s)**

**Concept A:** Directional Light & Vibration SLF Attraction Station

A mounted station placed a fixed distance from the vine uses directional light and mechanical transmitted vibration to pull SLFs away from the crop and into a passive funnel for containment.

**How it would be used:** Install stations at row ends or vineyard edges; Periodically empty and reposition based on SLF activity.

**Why it's better than the status quo:** Usable during harvest when pesticides and manual removal are impractical; Reduces SLFs on fruit without slowing harvest operations.

**End-of-semester proof-of-concept:** A prototype with adjustable light angle, vibration mount, and funnel to measure change in SLF clustering vs. distance from a vine and capture rate.

**Concept B**: Scent and Visual Cue SLF Trap

A cylindrical trap with holes funneling inward just large enough for an SLF to fly in that uses the scent of a Tree of Heaven and is mounted on a tall, slender silhouette to attract the SLF. This would hold a liquid to inhibit SLF flight and drown them.

**How it would be used:** These traps would be hung or placed on poles above or below vines to kill SLFs

**Why it's better than the status quo:** Usable during harvest instead of pesticides or manual removal, and requires little human effort; Passively attracts and kills SLFs and get them off the crop for harvest

**End of semester proof-of-concept:** A cylinder with holes angled inward just large enough to allow SLFs to enter. Inside it can hold Tree of Heaven sap and emit its scent and hold a pool of soapy water, or another liquid, at the bottom to disorient and drown SLF.

**Key risks / unknowns :**

Risk 1: Quantitative effectiveness of the light and vibrations/tree of heaven liquid at attracting the SLFs is unknown. We can test this by placing SLFs in a controlled environment with access to these stimuli and vines. Risk 2: How the stimuli affect other organisms in the vineyard or how the stimuli may be affected by weather or time of day; these could be tested in a controlled environment with varying conditions.

**Questions for Clients:**

1. **Trap type & placement:** Where can a trap be installed without interfering with the mechanical harvester?
2. **Electricity needs:** If a trap needed power, should it run on a battery or is an external source like a solar panel possible?
3. **Attracting SLF:** What effective and practical baits are there to attract SLF into the trap?

**References:**

Caitlin Hayes, Cornell Chronicle, and 2025 January 27. “Spotted Lanternflies Could Cost Nys Grape Industry Millions.” Cornell Chronicle, Cornell University, 27 Jan. 2025, news.cornell.edu/stories/2025/01/spotted-lanternflies-could-cost-nys-grape-industry-millions.