2022 Spotted Lanternfly
Annual Accomplishment Report
FAIN: AP22PPQFO000C363

Year:	2022
State:	California
Cooperative Agreement Name:	Spotted Lanternfly Survey
FAIN:	AP22PPQFO000C363
Project Funding Period:	July 1, 2022 – June 30, 2023
Project Report:	**Survey Report**
Project Document Date:	July 1, 2022 – June 30, 2023
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Quarterly Report	☐
Semi-Annual Accomplishment Report	☐
Annual Accomplishment Report	☒

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A. Purpose

The project is to conduct a risk-based statewide survey for the Spotted Lanternfly (SLF), *Lycorma delicatula*. This survey focuses on areas of high risk of introduction where the preferred host, tree of heaven (TOH), *Ailanthus altissima*, is found. As the infestations of SLF spread in the eastern United States, there is increasing pest pressure on California. An expansion of the infested area increases the likelihood that it will be introduced to California and become established. Movement of eggs from infested areas of the eastern United States and Asia is considered to be the main potential mode of introduction.

SLF is an imminent threat to grape production in California. The grape industry in California is worth an estimated $88.12 billion including the value of wine production, tourism, job creation, taxes and other economic impacts. The California grape industry is the second largest agricultural industry in the state with grape cash receipts valued at $5.54 billion in 2021. Additionally, grapes cover approximately 828,000 acres of land across the state. If the pest establishes in the state, it will lead to significant increases in pesticide use and dramatic cost increases to grape production. SLF presence is also likely to disrupt export markets for fresh table grapes. Any future eradication projects for SLF in California will depend on early detection of any incursions of the pest. If the pest is allowed to multiply and spread for a significant period of time before detection, it is likely to become permanently established in the state. There are not yet any known lures or mating disruption technologies for SLF that would enable an environmentally friendly large-scale eradication project. The lack of a lure would also make delimitation more challenging. Early detection of any incursions of the pest is critical to the success of possible future eradication projects.

B. Activities

1. Monthly activities:

July - Conduct survey site selection and make initial contacts to arrange for survey activities. Train permanent personnel. Obtain supplies needed for field activities. Hire and provide training to seasonal personnel.
July – October - Conduct SLF visual survey.
October– December - Prepare annual report, clean and repair equipment and furlough seasonal personnel.
January– June – Prepare reports, summarize data, clean and repair equipment.

2. Survey methodology

A continuous monitoring effort to determine whether SLF may be present in California was developed and implemented in 2020. This approach was modelled after a risk-based survey that was further refined and executed again in 2022. No evidence of SLF infestation were found during the survey in any year. The survey was focused on areas

of high risk of introduction where the preferred host, TOH, was found and on other host plants such as wild grape vines when TOH was not present. Movement of eggs from infested areas of the eastern United States and from infested areas of Asia was also considered when selecting sites. Because SLF is known to lay eggs on any object near its primary host, many of the pathways are similar to those of spongy moth movement, including vehicles, outdoor articles, containers, and packing materials.

The potential high-risk locations targeted in the survey were major railyards receiving a high volume of railcars from the eastern United States (Roseville) and Asia (those receiving cargo from the ports of Los Angeles and Long Beach); sites receiving multiple shipments of goods directly from SLF-quarantined areas in the eastern United States since 2019 as determined by records of spongy moth hold notices issued by the border protection stations (Form 008A); direct stone importers potentially receiving material from infested areas of Asia; port areas receiving cargo, containers, and other potentially infested material such as dunnage from Asia where Asian defoliating moth traps are currently serviced; and campgrounds receiving large volumes of out-of-state visitors.

Regarding 008A receivers, sites likely to store received and potentially infested materials outdoors for longer periods were prioritized, such as PODS® and similar containerized moving systems, trucking companies, and distributors with many trailers on site. Though SLF has been found during air cargo inspections, it was determined that this is a relatively low risk pathway for California, because such SLF are likely to have flown into these planes (prior to takeoff) and flying SLF are unlikely to be gravid (gravid females are poor fliers). In addition, SLF are unlikely to avoid desiccation and remain viable without host plants for very long after a cross-country flight (see air cargo inspection section below for additional information). TOH was the target host of this survey, though grapevines, either wild or maintained, were surveyed when no TOH was present. While SLF has been recorded feeding on many hosts, literature, eyewitness accounts from infested areas, as well as the input from the SLF Science Advisory Panel suggest TOH is the preferred host, particularly for adults.

Inspectors were instructed to find one or more survey sites with hosts near each target location, working from the target location outward up to a half mile. Satellite view maps of the target locations with a quarter and half mile buffers were provided. At each site, inspectors spent five minutes visually scanning the tree(s) or grapevine(s) and surrounding vegetation for signs of SLF nymphs, adults, egg masses, feeding damage, and honeydew. Latitude and longitude of the host were recorded. If multiple TOH trees were present, the largest tree or stand of multiple trees was chosen, since SLF are thought to be visually attracted to larger host trees. The date, surveyor name, site name, host presence, host info (single or multiple trees; diameter at breast height (> or < 6" diameter), lat/long of the host, number suspect adults/nymphs/egg masses, and any relevant comments were reported. On an accompanying target location map, inspectors marked with pen or sharpie the location(s) of host site(s).

Survey guidelines were based on the CAPS-approved methods and were carried out when or after the SAFARIS PestCAST model predicted 1-50% adult emergence in a given survey area (https://safaris.cipm.info/safarispestmodel/StartupServlet?pestcast). The degree-day threshold was reached at different times throughout the state, and the survey took place from July through October.

C. Benefits and results of survey

In 2022, a total of 618 sites were surveyed for SLF in 50 counties (Table 1). The California Department of Food and Agriculture (CDFA) was able to further leverage the survey by subcontracting with County Agricultural Commissioners and county staff to survey additional sites of interest which were outside of the scope of this survey using state funds. An additional 564 sites were surveyed by county staff which included the placement and monitoring of 30 traps (Table 2). No SLF were found during the course of the survey.

Table 1: State run survey, number sites by county and location type (sites are hosts near each target location).

County	008A Site	Campground	Fairground	Port	Railyard	Rest Area	Stone Importer	Total
Alameda	34	0	1	4				39
Amador		1	2					3
Butte	1	6	2					9
Calaveras	2		2					4
Colusa	1	1	2					4
Contra Costa	10		1					11
El Dorado	2		3					5
Fresno	9		2				1	12
Glenn			1			2		3
Humboldt	2	4	4	1				11
Imperial						3		3
Kern	9	1	2			2		14
Kings	1		2					3
Lake	1	1	2					4
Los Angeles	68		1	1	11		6	87
Madera	3	4	4					11
Marin	1	1	2					4
Mariposa			2					2
Mendocino			2					2
Merced	2		4					6
Monterey	8	2	3				1	14
Napa	3	1	4					8

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County	008A Site	Campground	Fairground	Port	Railyard	Rest Area	Stone Importer	Total
Nevada	1		2			1		**4**
Orange	14		1				3	**18**
Placer	4	2	4		20	1		**31**
Riverside	17	1	1			1	1	**21**
Sacramento	22	4	2					**28**
San Benito	1		1					**2**
San Bernardino	25		1		1	1		**28**
San Diego	30	4	1	2		3		**40**
San Francisco			1	2				**3**
San Joaquin	9		4	2				**15**
San Luis Obispo	4	2				1		**7**
San Mateo	11		1					**12**
Santa Barbara	7	2	5					**14**
Santa Clara	17	1	2				1	**21**
Santa Cruz	4		1					**5**
Shasta	3	1	2			1		**7**
Siskiyou	1							**1**
Solano	4		4	3				**11**
Sonoma	16	3	6					**25**
Stanislaus	9	1	1			2		**13**
Sutter	3		3					**6**
Tehama	1	1	2					**4**
Trinity						1		**1**
Tulare	3	1	2			2		**8**
Tuolumne			2					**2**
Ventura	9	3	1	2				**15**
Yolo	11		2	3				**16**
Yuba	1							**1**
Grand Total	**384**	**48**	**100**	**20**	**32**	**21**	**13**	**618**

Table 2: County run survey

County	Total Sites Surveyed
Butte	123
Kings	105
Mendocino	1
San Diego	60
Solano	21
Los Angeles	8
Fresno	74
Napa	30 (traps)
El Dorado	142
Total Sites	**564**

D. Training

Survey staff were trained in how to identify SLF and visual survey techniques, proper sample submission and how to use the Survey 123 App, which the CDFA used to simplify and standardize data collection. A training was also provided to county staff on SLF biology, identification and visual survey techniques. County staff were also trained how to use the SLF Survey 123 App.

E. Database submissions

There were no suspect samples submitted for identification in 2022 as part of the 2022 SLF survey.

Approved and signed by:

Andrew R. Cline Digitally signed by Andrew R. Cline Date: 2023.10.23 20:32:26 -07'00'

Andrew Cline, Acting ROAR Date
California Department of Food & Agriculture
Plant Health & Pest Prevention Services

BETH STONE SMITH Digitally signed by BETH STONE SMITH Date: 2023.10.24 14:17:37 -07'00'

Beth Stone-Smith, ADODR Date
United States Department of Agriculture
AHPIS, Plant Protection & Quarantine