

SLF Working Group – 1st Annual Meeting
Albright College, Reading, PA
July 16-17, 2018

Meeting Notes, taken by Louise Bugbee

Opening and Welcome – Julie Urban, Penn State University

We are ‘alarmed and horrified’. SLF is worse than we thought. **Potentially the most devastating pest in 150 years.** We need to collaborate, share and work together to keep this one under control

Overview of day – Heather Leach, Penn State University

Discovery and Initial Reaction in PA – Sven-Erik Spichiger, Pennsylvania Department of Agriculture (PDA)

- Initial detection 9-22-2014 Eastern Berks County - an eagle eyed DCNR employee – The Big Find
- 2014-15 damaged *Ailanthus* trees noted, sooty mold, strange “moth”
- PDA immediately on site – identified insect as a Fulgorid – Asian invasive – **SLF = trouble**
- Identified stone importer nearby (like we don’t have enough stone of our own in PA), assessed direct impacts
- Began background investigations with importer RE: place of export, current shipping status in area, when, where, how much to determine extent pathways for dispersal
- Search of Korean literature –
 - Reached Korea from China? Spread throughout country in 3 years! (very alarming for PA)
 - feed on >65 plants but preferentially narrows range to *Ailanthus* before mating (at least in Korea)
 - overwinters as egg masses- 30-50 eggs/mass (difficult to find)
 - mate multiple times (what does this mean for PA)
- Pennsylvania Department of Agriculture (PDA) Rapid Response
 - 40 1kmx1km grids for surveillance – delimiting survey
 - Banding to intercept nymphs
 - New Pest Advisory Council and Technical Working Group
 - Notified ports, trained import company employees, checked vineyards, orchards
 - Public education efforts – pest alert, Riker Mounts to institutions, colleges, museums, photos
 - Citizen involvement
 - Initiated Quarantine** first at township level, later increased to county level
 - This is everyone’s pest. We need to share. You can never prove a negative.***

USDA-APHIS Control Plan - Leo Donovall, USDA-APHIS

Tim Newcamp, Supervisor for Field Techs

- Cooperative response – all hands on deck – USDA, PDA, Penn State
- Responsibilities – PDA, core of infestation suppression, monitor high risk pathways; PS Extension, outreach
 - USDA, treatment, goal- **Keep Quarantine within the existing area, not expand it**
 - Set up 4 regional offices-Easton, Glenside, Minersville, Lancaster
 - 18 mi (30km) band around perimeter; 3000 sq.mi. around edge of Q-zone; gridded out
 - Mapping *Ailanthus* for treatment
 - SOP – Apr-May assessment, May-Aug treatment, May-Nov monitoring
 - Weekly emergence maps
 - To date- visual surveys completed, 3 treatments complete, 12 on deck
 - Plans to return in 2019 to keep it contained
- Funding – Commodity Credit Corporation (CCC), USDA \$17.5 million- Rapid Response, Research, Outreach
- Research Needs –
 - Improved trap designs, Lures – to limit by-catch and reduce effects on non-targets
 - Treatment Options – neo-nics are effective but need other options, organic options, homeowner recommendations
 - Impact studies on economic impacts
 - Alternative hosts? Harm?

Big Question – Can SLF complete its lifecycle without Ailanthus?

USDA-APHIS Research Update - Miriam Cooperband, USDA-APHIS

- 4 areas – 1. trap and lure development, 2. host preference, 3. behavioral assays, 4. dispersal studies
 1. traps and lures - Kairimones – volatiles from *Ailanthus* and grape to develop lures, methylsalicylate lure promising
WebCote bands from NJ – better than what we are using, less bycatch, catch more
 2. host suitability – sex ratio first summer 100% female on *Ailanthus* in August, second summer massive flight – possible host depletion
Greg Setliff – 3rd instar huge host shift, went to *Ailanthus*, ignored grape
May be better to treat trap trees earlier but will the insecticide last
Field sleeve studies in lab – *Ailanthus*, Chinaberry, grape, hops – only 4 plants on which SLF nymphs got to adult stage – suitable development hosts?
 3. behavioral studies – essential oils of leaves – *Ailanthus* wins again
Electrophysiology – electrodes attached to SLF antennae to detect response to various volatiles – do the “smell” them? attract or run away
Antennally Active Compounds- *Ailanthus*, black walnut, hops
 4. dispersal studies – how far apart should trap trees be?
1 hectare – capture, dye and release, recapture
Nymphs, 80% stayed put – good food source; adults exhibited greater tendency to migrate
 - Anecdotal observations:
 - Erica Smyers – only offered grapes, died at 3rd instar
 - Miriam - offered grapes and *Ailanthus*, all moved to *Ailanthus*
 - Brain Walsh – nymphs seen eating grass
- 2018 – new traps, better designs, better lures, trap tree placement**

Penn State Research Update - Julie Urban, Penn State University

- Research currently funded for one year at a time

Farm Bill \$\$\$

- SLF genetics – Korea or China? need new markers to determine where it came from, implications for cold tolerance, pesticide resistance – founder population studies
- Obligate bacterial symbionts – another way to determine where
- Microbial communities – sampling leaves to see effects of sooty mold on microbes in specific plants
- Behavior – sex pheromone attractants, non-pheromone attraction

PDA \$\$\$

- Feeding damage – cage studies on grapes, what level of feeding can vines endure
- 2019 – using nymphs and adults
- Insecticide efficacy – lab studies on grapes and SLF egg masses
- PS Berks and Lehigh - 500 peach trees, 250 grapes, 20 different insecticides
- Band counting App
- Reproductive development – endosymbiont transmission
- Parasitized egg imaging with new X-ray machine for lab

Wine Association \$\$\$

- Sooty mold influence on wine
- SLF toxins in wine
- Grape grower needs assessment

Ag Research \$\$\$

- Feeding behavior – PS Quarantine greenhouse
- How are they entering plants? Through lenticels?

We all need to work together for long term funding

USDA-ARS Research Update –

Tracey Leskey, USDA-Agricultural Research Station

- Appalachian Fruit Research Center, West Virginia – searching and surveys, no SLF yet
- Working on fruit and forest damage, baseline dispersal, traps and lures, translating Asian research documents, behavior and, host finding

Kim Hoelmer, University of Delaware, USDAARS; working with Chinese Head of Forestry, PADCNR

- Asia – foreign exploration studies seeking egg parasitoids in China and Korea - *Anastatus orientalis*
- Host specificity studies, plant hoppers
- *Dryinus sp. browni* – attacks nymphs

Virginia Tech Research Update - Doug Pfeiffer

- *Verticillium nonalfalfae* – can SLF move this around to kill *Ailanthus*?
- Virginia knew it was coming, got prepared
- January 2018 – found SLF in North Winchester – public meetings, State, County, Local
- Noted on *Ailanthus*, wild grape, table grape, multiflora rose, poison ivy, sumac, black locust, white pine
- Need phenology work, use degree days, in N.VA. May 8-nothing. May 9-they're out, July 12-adults
- VA Dept of Agriculture and Consumer Services (VDACS) has eradication plan in place, sampling, info sessions, *Ailanthus* treatment

VA at crossroads - Real concern for movement– find treatment for rail cars, trailers, etc.

Rutgers Research Update – Julie Lockwood, Rutgers University

- eDNA – living things continually shed DNA, sampling can tell what has been there, developed for aquatic invasives, enables detection of rare organisms in given environment, QPCR
- move to terrestrial application for SLF detection – sample several plants, use honeydew, “wash off” several plants (trunks, leaves, soil) – aggregate DNA, test using genetic assays for SLF
- detect SLF sight unseen in areas of low abundance, foundation of delimiting survey
- now vetting assays to improve specificity and expanding tests of field survey techniques

Temple University Research Update – Matt Helmus, Temple University

- Integrative ecology – use past data to model future spread, modeling of SLF population dynamics
- predict economic impact, risk of spread, effects on crops and exports
- provides a visual representation of potential harm

Industry Panel

1. The Orchardist View – Ed Weaver, Weaver’s Orchards

- SLF damage to date – apple, peach, pear, nectarine, not on hardy kiwi
- 2016-17 took out some *Ailanthus*, kept some trap trees, noted nymphs on maple
- Selective spraying with Carbaryl

Concerns: bud development in year following feeding damage, effects of feeding on young trees, customer experience for pick-your-own and agritainment, customer education and possible transport of SLF off site

2. The Forestry View – Wayne Bender, Hardwoods Development Council

- Established a list of BMPs including permitting, inspection and delivery
- Actively looking for egg masses

Concerns: Is it really going to be classified as a forestry pest? Communication with Amish/Mennonite

3. The Green Industry View – Brian Walsh, Salix Springs Landscaping

- We must be sympathetic to homeowners, don’t say their gross infestation is “awesome”
- We need life cycle information relative to PA
- We need the *Ailanthus* question settled – SLF on River birch, walnut, silver and red maples
- Investigate sap flow

Concerns: pathogen interaction - evidence of tulip tree scale after heavy SLF last year, need to determine whether SLF can transmit other diseases either mechanically or by feeding, homeowners are ground zero for spread

4. The Vineyardist View – Jenny Metz, Maple Springs Winery

- 2017 sprayed: early-Assail (a.i. acetamiprid) and Intrepid (a.i. chloropyrifos), later Venom (a.i. dinotefuran)
 - Grape vines near woods where *Ailanthus* was dominant – low yields, no fruit set
 - Honeydew noted on leaves but not on fruit
 - SLF are phloem feeders – do they seek nitrogen not sugars? amino acids? Feed on highly fertilized plants
 - SLF and cantharidin, what effect if in grapes/wine, how many insects in a lug are acceptable
- Concern:** the ability of SLF to act as a vector for other viral and bacterial diseases

Current Regulatory Guidelines – Dana Rhodes, PDA

- Review of PA Ag economy values – billions at stake – fruits, forest, tourism, hardwood
- Honeydew on hops - not usable for brewing
- Quarantine remains in place - permitting, compliance agreements
- So far, they have proven easy to kill – Sevin
- It's the spread we are concerned about

Lanternflies adapt and we must too

New York Permitting and Inspections

- NY State using an Incident Command Structure (ICS)
- Focusing on areas coming out of PA quarantine zone – interstate highways 81, 84, 88
- Regulatory Plan includes: checkpoints for commercial vehicles, inspections of 8000 established nurseries and growers, stone yards, wood products, campgrounds, Christmas tree vendors, rail yards, warehouse, distribution centers and parcel facilities
- Inspection of products from PA, VA and NJ
- NY has authority to inspect commercial vehicles at one checkpoint 24 vehicles from PA, only 3 had compliance
- DOT employees trained about SLF, possible drone use to inspect tops of trucks
- Researchers coming in will need permits

Penn State Extension Overview – Dennis Calvin, PSU

- We are serious about working with partners to prevent the spread of SLF and community awareness
- PSU got \$1.2 million for outreach efforts
- Established call center – 18 phone lines, 8 locations, 1-888-4BADFLY
- 50 Master Gardeners trained, websites updated
- Weekly meeting of SLF task force
- Emergency Management Team – how does it move? Football games? branch campuses to University Park
- National SLF Conference

PSU Extension Update – Heather Leach, PSU

- Focus on grapes and fruit
- Tabulating Survey Monkey results- grower needs
- We need management guidelines for ornamentals
- Increase awareness for permitting and quarantine zone regulations

New York Extension Update – Time Weigle, Cornell University

- Using ICS structure
- Northeast Integrated Pest Management (NEIPM) Center will be the outreach leader in NY
- Central website

Extension need – Multi-agency/institution message coordination

Discussions related to funding proposals

Jason Harper, PSU Ag Engineering

Had funding from Center for Rural PA to gauge impact in PA, now we need funding for cross-border impacts – USDA? Specialty Crop Research Initiative (SCRI)?

Things to remember in funding proposals – estimating impacts and management costs

Problem – 2012 is the most recent census data, we are working with old data

- not all crops represented in 2012 data (i.e. hops and breweries)
- changing values of acreage and crops (vines, trees, nurseries, field crops)
- monitoring costs - traps, time, salary increases
- spraying costs- time, people, chemical cost
- banding – supplies, time
- *Ailanthus* management – chemical costs, time
- direct vs. indirect losses – fruit quality this year vs. loss of whole tree next year, loss of tourism during infestation vs. loss of stands of hardwoods
- the program and funding estimates will depend on inputted data

Estimating impacts – the numbers we come up with will “live forever” make sure you get it right

Other considerations and implications for funding:

- Agritainment enterprises regulated at the county level, get input from county officials
- Cost of compliance for farmers and forestry
- Official recognition of SLF as a “forest pest” – costs of quarantine, aerial surveys around zone, SLF effects on seedlings and understory
- Use PA as successful example of timely quarantine establishment, subsequent limited expansion
- Estimates of cost to communities along the edges of the quarantine zone – readiness, education, planning
- “knowledge products” ranked as most important

Farm Bill 2019 Discussion – Greg Parra \$75 million available, CCC – **August 17 cut-off**

- Farm Bill 2019 - right now use regular goals but SLF related proposals may be changed to Goal 6 – Rapid Response – but that can be very general
- Most successful entries are full-blown plans, thoroughly researched and cited, multi-state plans get favorably ranked, get endorsements, state level internal reviews, work with other agencies so as not to duplicate efforts
- Typical size of awards- \$10,000-\$250,000 depending on scale and type of project
- Online trainings/live webinars on USDA Farm Bill page to assist in submitting proposals
- Julie Urban will organize monthly call for researchers to share last year’s proposals and reviews, short, middle, long-term research agendas, go for 3-year projects
- Reach out directly to collaborators
- **Have a clear budget**, keep salary requests inline

Top 5 priorities- ranked by attendees

Regulatory

1. Methods for Survey Delimitation
2. Lists of High Risk Pathways
3. Funding for Regulatory Activities
4. Tie - Messaging for Targeted Audiences, Consistent Messaging for Quarantine Regulations
5. Tie – Establishment of Federal Quarantine, Methods for Compliance Inspections

Research

1. Development of Classical Biocontrol Programs
2. Behavior and Behavioral Ecology
3. Potential Direct Impacts on Crops, Domestic Animals and Wildlife
4. Host Plant Chemical and Nutritional Ecology
5. Host Range of SLF

Extension

1. Industry Specific Outreach Materials
2. Consistent Messaging for Media and Outreach Materials
3. Audience Specific Outreach Materials
4. Informing Homeowners about impacts on pollinators and non-targets
5. Tools and Delivery for MGs and Volunteers