

# Pennsylvania Department of Agriculture 2020 Entomology Program Report

The Pennsylvania Department of Agriculture (PDA) Entomology Program is responsible for the regulation of insect plant pests, which includes survey, laboratory analysis, and control/mitigation of new invasive insects when warranted.

All samples were screened for Cerambycidae, Buprestidae, Scolytinae, Siricidae, Vespidae (Vespula), Bombus, Spotted Lanternfly and other select species including *Sirex noctilio* and *Adelges tsugae*. Entomology surveys are carried out by permanent and temporary PDA staff, as well as cooperating government and non-government collaborators. Insect samples are also submitted through cooperative extension, private industry, and the public.

## **SPOTTED LANTERNFLY:**

The Pennsylvania Department of Agriculture works on multiple fronts to combat *Lycorma delicatula* (Spotted Lanternfly, or SLF), including focus on Survey and Treatment, Quarantine Compliance, and Communications. PDA is aided in this battle by its partners, the United States Department of Agriculture (USDA), Penn State University and Extension, County Conservation Districts, and sister Pennsylvania State Agencies.

## **SPOTTED LANTERNFLY SURVEY AND TREATMENT OVERVIEW:**

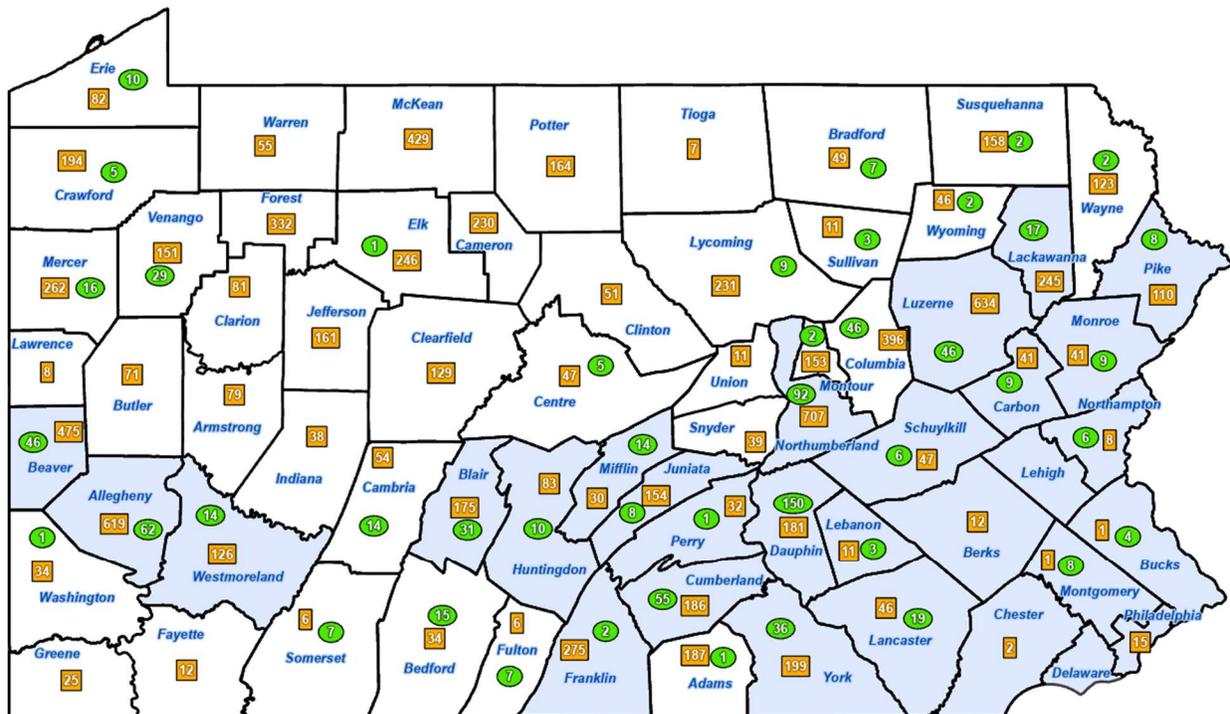
Since the first detection of Spotted Lanternfly on September 22, 2014 by an agent of the PA Game Commission, PDA has surveyed and treated properties across Pennsylvania in the effort to understand, control and contain this invasive pest.

Survey work has occurred in each of Pennsylvania's 67 counties and occurs in two main ways: the setting of traps for on-going monitoring and early detection of SLF and through visual surveillance of all life stages from egg through adult.

In addition to survey work, PDA began treatment of properties for Spotted Lanternfly in 2015. The process of treatment entails a full inventory of a property for all *Ailanthus altissima* (Tree-of-Heaven), a preferred host for SLF. PDA's goal in this treatment is the removal of most of the invasive Tree-of-Heaven, while retaining approximately 10% for the systemic application of

insecticide. When feeding on these “trap” Tree-of-Heaven, SLF ingests the insecticide, causing rapid death. This process has proven effective in sites across the Commonwealth with roughly 140,000 trees receiving treatment in 2020.

In 2020, PDA added the broadcast application of contact insecticides as an additional treatment option. Initial applications were tested by Penn State University at Blue Marsh National Recreational Area in Berks County. Additional applications were made by PDA at several locations across the state. This treatment option proved highly effective and will be continued in 2021.



Spotted Lanternfly: Where PDA and USDA worked in 2020

- Treatment for Spotted Lanternfly
- Visual Surveys
- Trapping Surveys



Overview of PDA and USDA Treatment and Surveillance Activities

## **SPOTTED LANTERNFLY QUARANTINE COMPLIANCE:**

On November 1, 2014, the Pennsylvania Department of Agriculture issued a quarantine with the intent to restrict the movement of SLF. While these restrictions slowed the spread, the pest continued to expand its range with quarantine expansions leading to 26 quarantined counties across PA by the end of 2020. As the quarantine has grown, so has PDA's response, and in early 2020, an additional Inspection Technician joined the Program Specialist and four Inspection Technicians (bringing the total to five across the State) to aid businesses in complying with the quarantine order. The team has held numerous permit trainings for businesses across the state and performed inspections of transportation vehicles in cooperation with the Pennsylvania State Police.

## **SPOTTED LANTERNFLY COMMUNICATIONS AND OUTREACH:**

PDA has teamed up with the communications offices of both Penn State University and the United States Department of Agriculture to bring a united and consistent message to all Commonwealth citizens. These messages go out through various means, including social media posts, press releases, news interviews, public events, informational handouts, videos, billboards, signs for parks and other public places, and advertising in newspapers and on public transportation.

PDA has partnered with members of local government and businesses to create SLF-specific Community Taskforces, which meet quarterly to discuss the efforts and needs of the community.

PDA also works with Penn State University on a large-scale Public Reporting Tool for recording sightings of SLF by the public. The ability to report is available either online via a PDA-created web application or through contacting a call center, staffed by Penn State staff. Reports from outside of the known infested areas are followed up by PDA staff across the state, where reporters are contacted and visited to confirm sightings and to quickly discover and control emerging populations. In 2020, more than 82,000 reports of Spotted Lanternfly were made by Commonwealth citizens, and of those 3,886 were followed up by PDA and USDA staff. Reports from counties with known, heavy infestations did not require follow-up visits.

## **FEDERAL ASSISTANCE:**

USDA has supported PDA efforts by supplying funding and contributing staffing and technology to this battle. Both in quarantine and non-quarantine areas, USDA and PDA staff work jointly to effectively survey and control SLF.

## SPOTTED LANTERNFLY SURVEY DETAILS:

PDA performed three surveys for Spotted Lanternfly in 2020, including Banding, Circle Trapping and Visual. Surveys were run for the entire year, though each survey occurs within a specific time frame. The Visual survey was performed from January through December; Banding was performed from May through December; Circle Trapping was performed from June through December.

2020 was the first year PDA utilized Circle Traps, a modification of Pecan Weevil traps, for both SLF detection and population suppression. Circle Traps will replace the sticky bands in future surveys, as they are less likely to have bycatch of non-target organisms.

## SPOTTED LANTERNFLY BAND SURVEY:

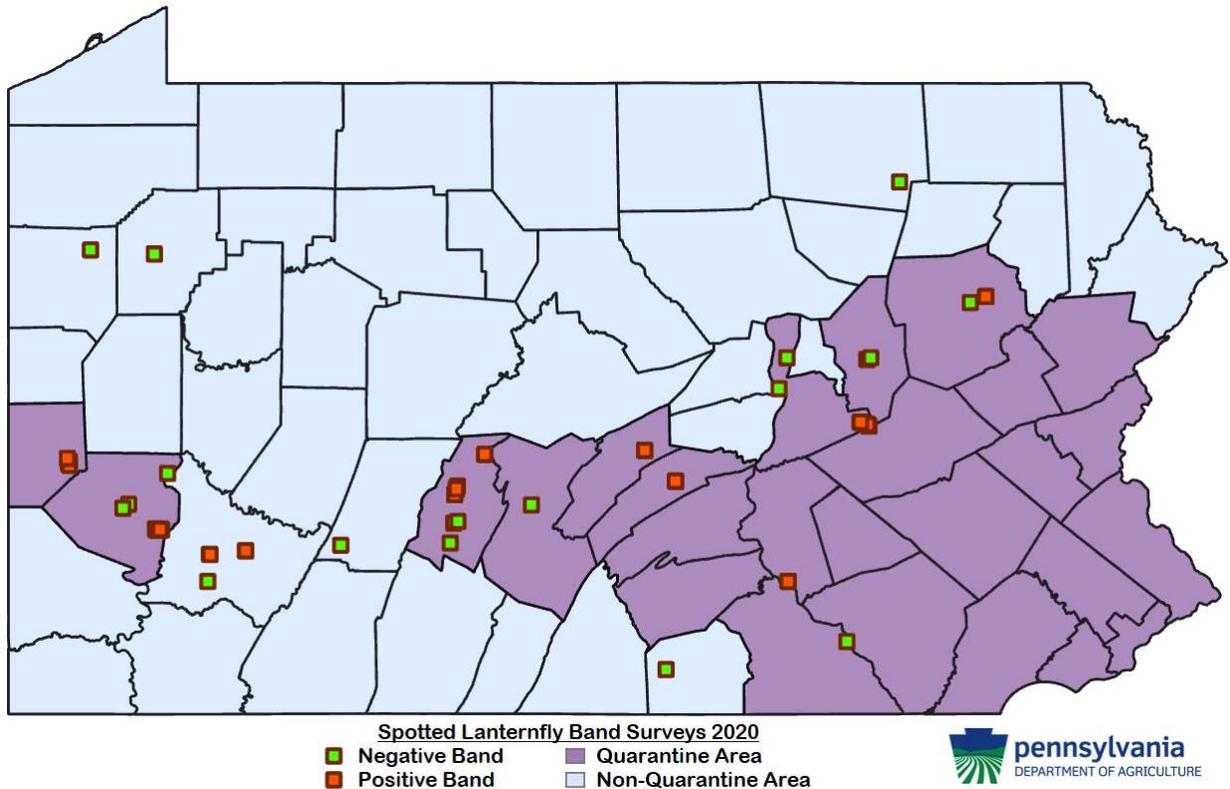
Survey performed 26 May 2020 through 7 December 2020

98 banding sites in 17 counties (6 regions)

183 services

45 Positive Band Locations (93 Positive services)

6,005 SLF reported killed



## SPOTTED LANTERNFLY CIRCLE TRAP SURVEY:

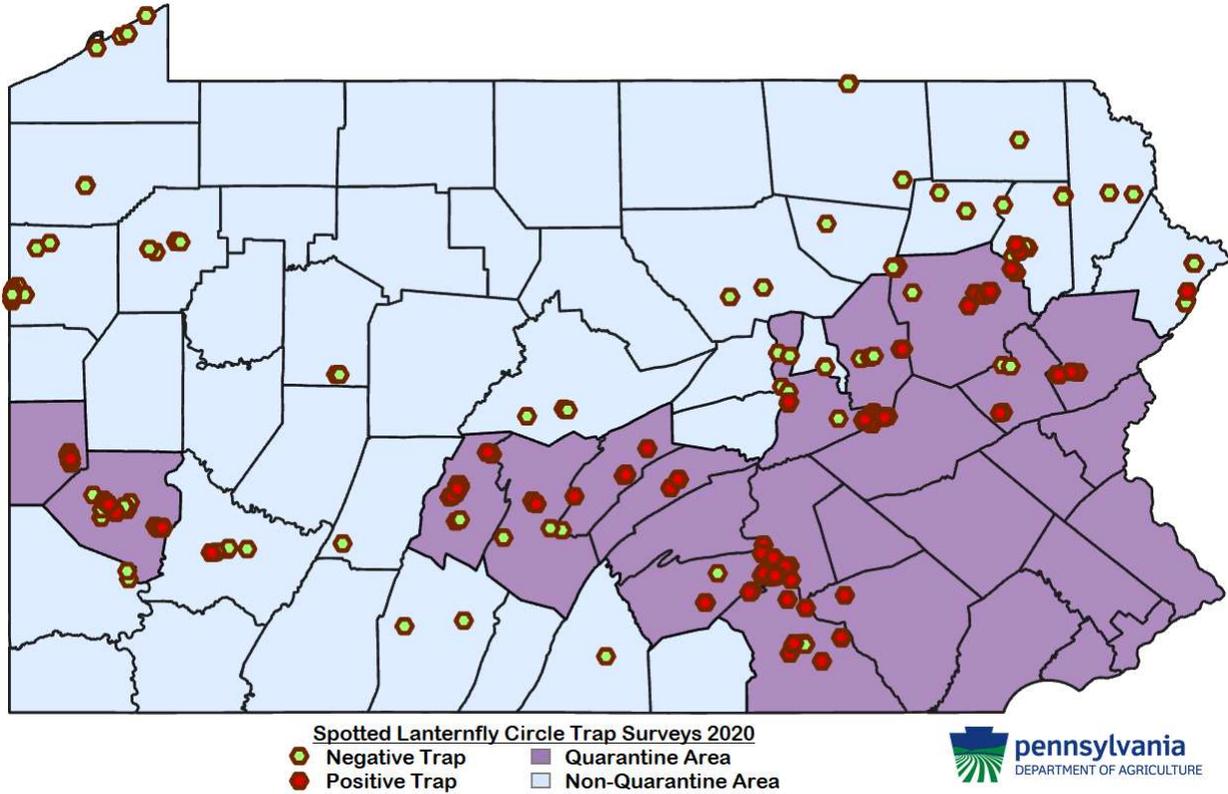
Survey performed 11 June 2020 through 31 December 2020

646 Circle Trap sites in 35 counties (6 regions)

2,732 services

392 Positive Circle Trap Locations (920 Positive Services)

19,451 SLF reported killed



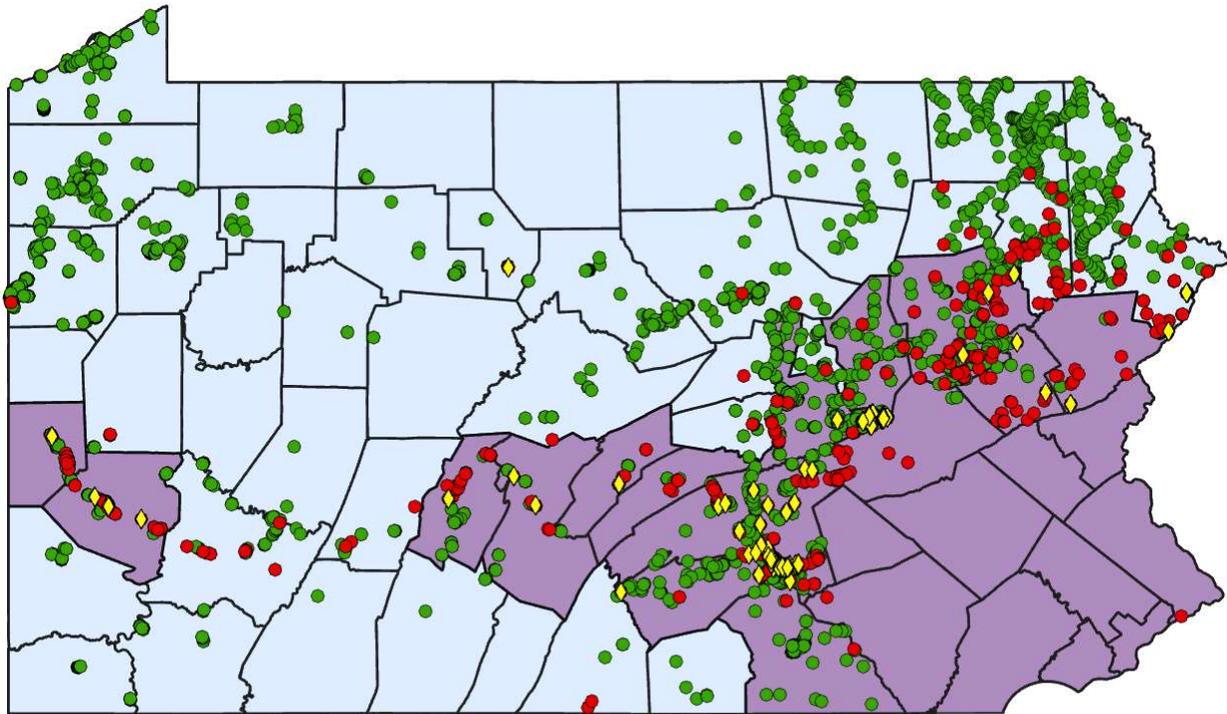
## SPOTTED LANTERNFLY VISUAL & SCRAPE SURVEY:

Survey performed 2 January 2020 through 30 December 2020

6,115 Visual surveys in 56 counties (7 regions)

32,373 SLF reported

6,631 egg masses scraped



**Spotted Lanternfly Visual & Scrape Surveys 2020**

- Negative Visual
- Positive Visual
- ◆ Positive Scrape
- Quarantine Area
- Non-Quarantine Area



## GRAPE COMMODITY SURVEY:

PDA first implemented a grape pest survey in 2010, using Farm Bill (now called PPA section 7721) funds from the USDA. This survey has been continued through 2020. The survey was run from July until the end of October 2020. Target pests for 2020 included *Lobesia botrana* (European grapevine moth), *Cryptoblabes gnidiella* (Christmas berry webworm moth), and *Lycorma delicatula* (Spotted lanternfly). In the summer of 2020, survey crews established 228 trap locations in 19 PA counties at locations supporting wine and juice production. The PDA lab received and processed 435 samples, from which 85 specimens were identified. Lab samples contained 5 specimens of *Lycorma delicatula*. In addition, 194 specimens of *Lycorma delicatula* were identified in the field by survey crews. No other target species were detected in 2020.

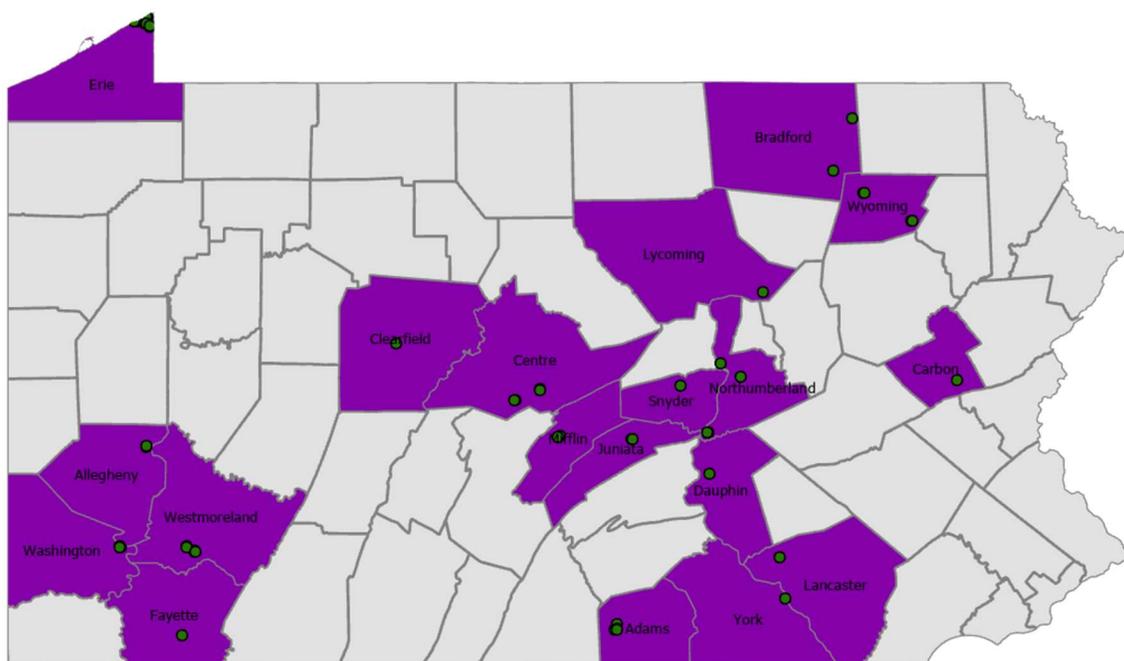
30 trap sites in 19 counties

228 trap locations

435 samples

85 specimens identified (lab), including 5 Spotted Lanternflies

194 Spotted Lanternflies identified (field)

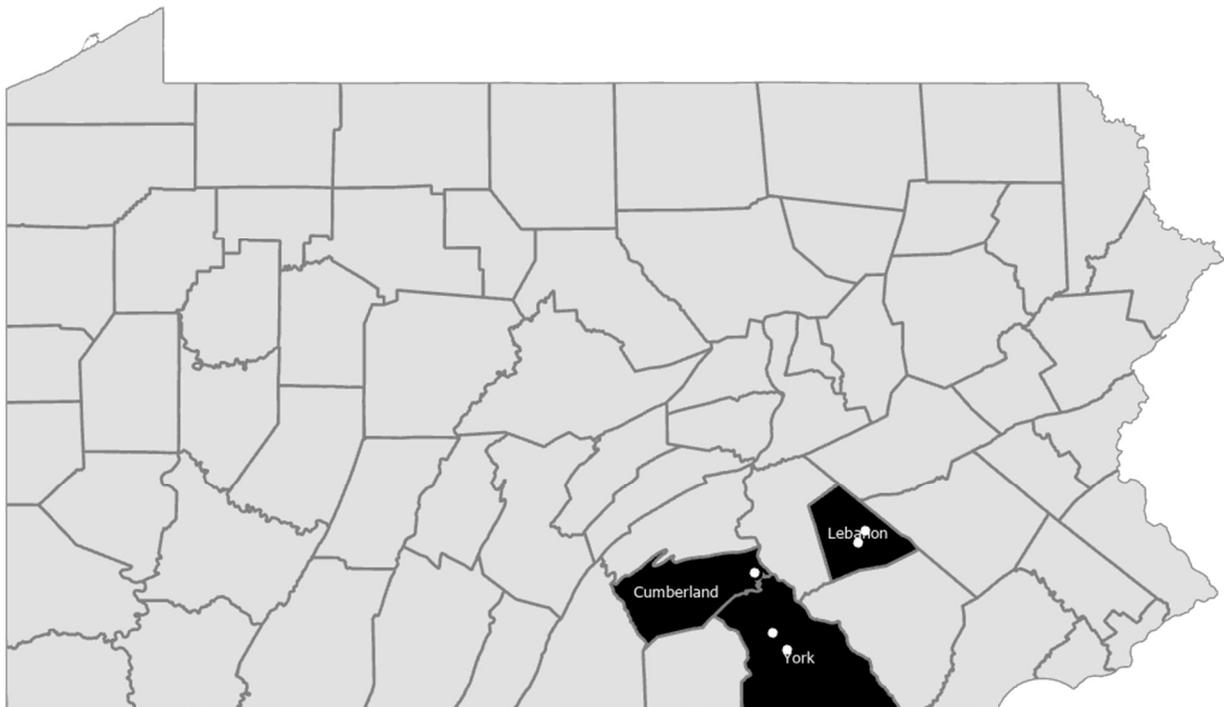


Grape Commodity survey trap locations 2020

## ASIAN LONGHORNED BEETLE:

The pest *Anoplophora glabripennis* (Asian longhorned beetle) continues to be a high priority for eradication if detected in Pennsylvania. PDA screens all wood destroying insect samples for ALB, all of which were negative in 2020. In addition, ALB visual surveillance is performed as part of Pennsylvania's Cooperative Agricultural Pest Survey.

5 trap sites in 3 counties  
25 trap locations  
173 samples  
30 specimens identified  
0 target pests identified



Asian Longhorned Beetle survey trap locations 2020

## COOPERATIVE AGRICULTURAL PEST SURVEY (CAPS) EXOTIC WOOD BORING BEETLE SURVEY (EWBB):

The Cooperative Agricultural Pest Survey is a federally funded survey that targets pests of specific national concern to agriculture. Though the EWBB survey targets species of national concern, it also adds species of state concern. Due to the extreme economic impact caused when non-native wood destroying insects are introduced to PA, PDA runs some form of this survey each year. Surveys are carried out in accordance with national survey guidelines. Pests

of state concern can be surveyed in a more flexible manner. In 2020, insects affecting oak, maple, walnut, other Northeastern hardwoods, and conifers were selected as target species. This included pests like oak splendor beetle, Asian longhorned beetle, oak ambrosia beetle, spruce engraver, bamboo borer, citrus longhorned beetle, and many other pests not known to occur in PA or with a very limited PA distribution. Information from the interception of pests at ports provided by the U.S. Customs and Border Patrol, European pest alerts, and NAPIS are used to help refine the list of target pests for PA. Protocols for the surveillance of many of these pests require visual surveillance, while others call for pheromone or plant volatile-baited traps.

For pests that are trapped, 12 sites were established at sites deemed high-risk for exotic pest introduction with 84 variously baited traps. Traps were run from April through the end of October. Each trap was serviced every two weeks, which generated a total of 641 samples and 3,149 specimens. A total of 9 CAPS targets were collected, all *Trichoferus campestris* from Lebanon County.

Visual survey points were taken at all sites and several additional locations, totaling 126 visual survey sites in 36 counties for pests that are visual survey only. All visual surveys were negative for target pests. This survey will be conducted again in 2021, targeting high priority potential pests and new high-risk locations.

12 trap sites in 12 counties

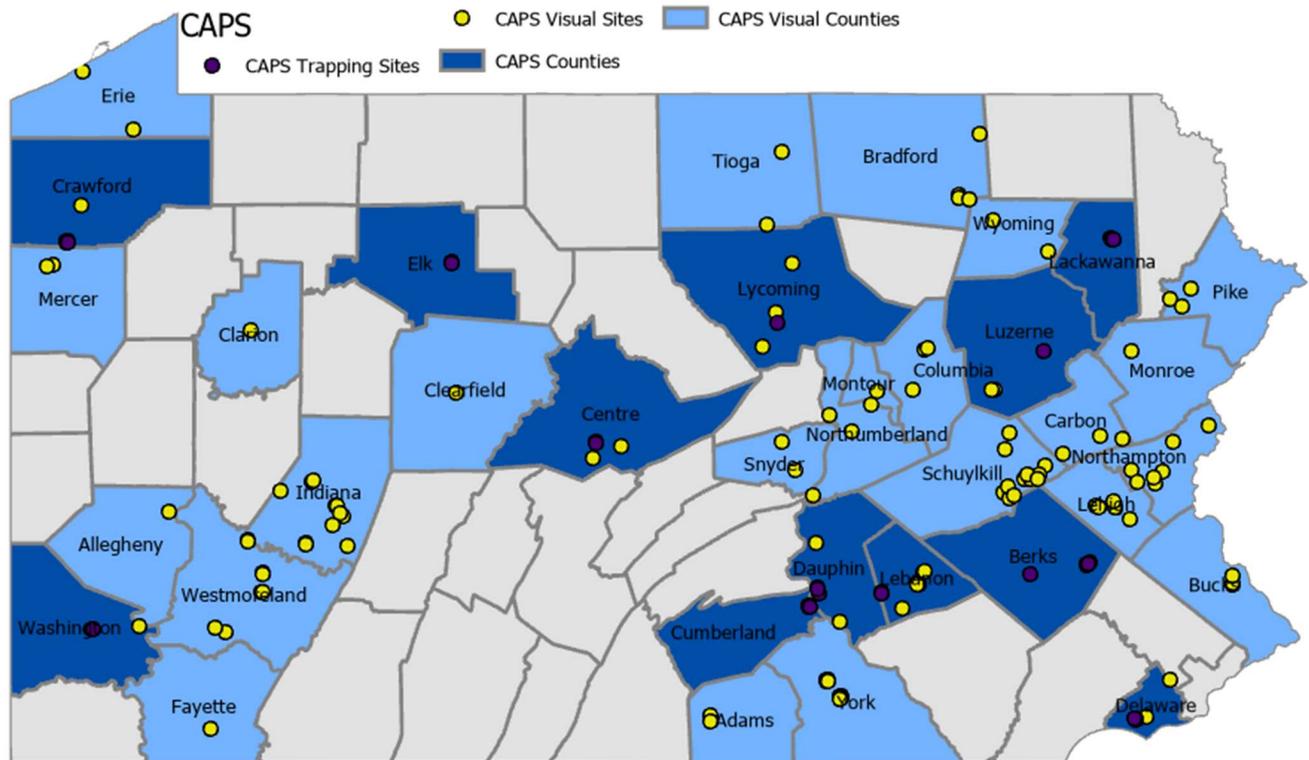
84 trap locations

641 samples

3,149 specimens identified

126 visual survey sites in 36 counties

9 specimens of the target pest, *Trichoferus campestris* were identified

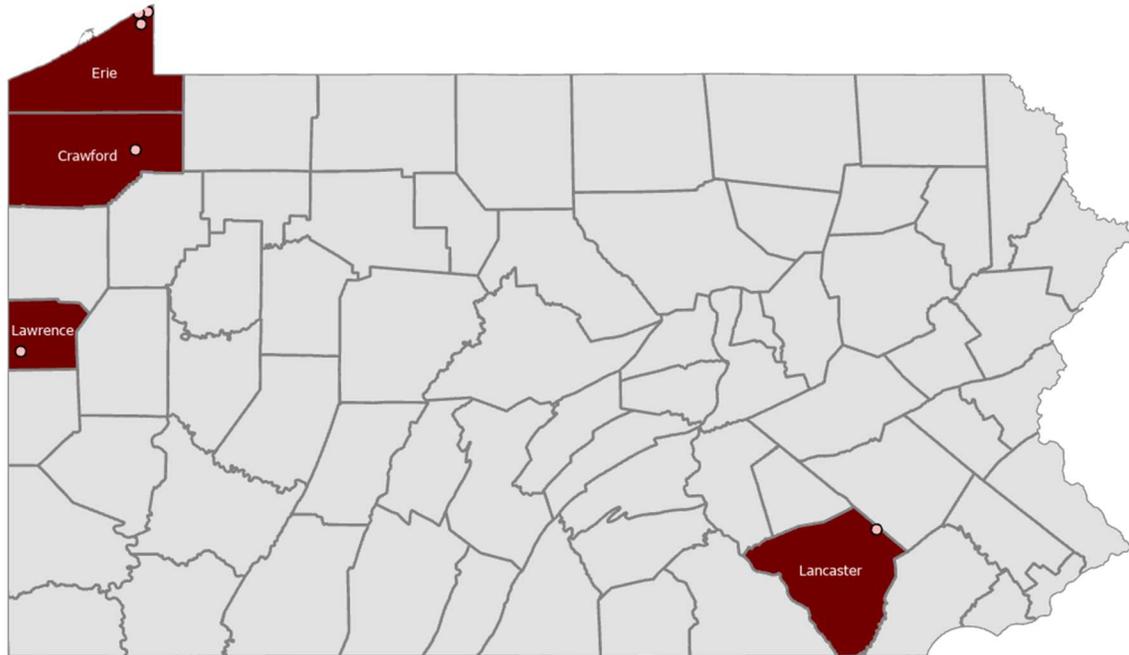


CAPS trap and Visual Survey locations 2020

### EUROPEAN CHERRY FRUIT FLY SURVEY:

The objective of this project was to survey for the invasive insect, the European Cherry Fruit Fly (ECFF) *Rhagoletis cerasi*. The survey was conducted by PDA in the following counties: Erie, Crawford, Lawrence, and Lancaster. PDA staff placed traps in cherry orchards or on Asiatic bush honeysuckle/cherry trees situated along wood edges or fence rows/hedge rows near fruit stand and produce markets. Traps were serviced every two weeks and then sent to the PDA laboratory to be screened for the target pest. A total of 7 sites with 42 traps were established and a total of 142 samples were processed. A total of 7 *Rhagoletis* and *Chaetopsis* were identified morphologically to rule out ECFF.

- 7 trap sites in 4 counties
- 42 trap locations
- 142 samples
- 7 specimens identified
- 0 target pests identified



European Cherry Fruit Fly survey trap locations 2020

#### **WALNUT TWIG BEETLE:**

In 2011, Penn State Cooperative Extension received a sample of dying black walnut from Bucks County. The cause was determined to be Thousand Cankers Disease, a disease complex caused by the interactions of a bark beetle *Pityophthorus juglandis* (walnut twig beetle) and the fungus it vectors. Trees at the initial detection site were voluntarily removed and destroyed by the property owner in February of 2012, and PA initiated a statewide trapping survey for the beetle. In 2020 with Farm Bill support, PDA focused trapping in uninfested counties adjacent to the quarantine of known positive counties. Additional counties across the state were also chosen based on business dealing in live edge walnut, a possible vector of the beetle. In addition, taxonomic support was provided for the state of Maryland in their work with this pest. A total of 24 specimen of *Pityophthorus juglandis* were collected from Maryland and

none from Pennsylvania.



Example Walnut Twig Beetle Trap

The quarantine for Pennsylvania was not expanded but remains in effect for Bucks, Chester, Philadelphia, Delaware, Lancaster and Montgomery Counties.

18 trap sites in 13 counties

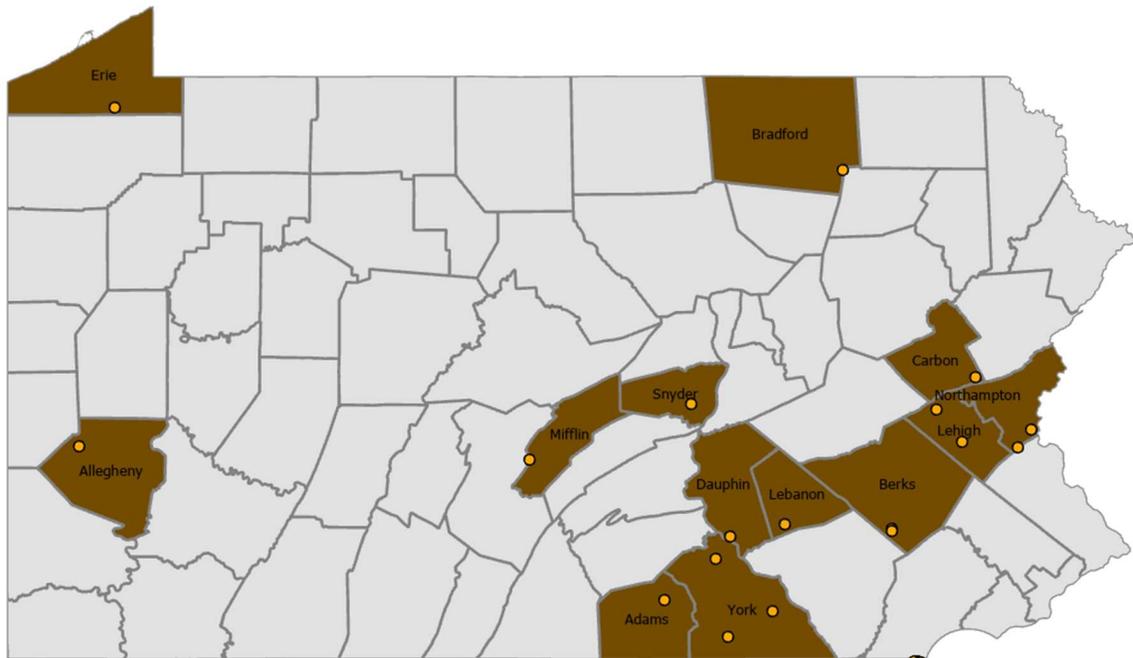
18 trap locations

148 samples

290 specimens identified

400 samples (Maryland)

228 specimens identified, including 24 target specimens (Maryland)

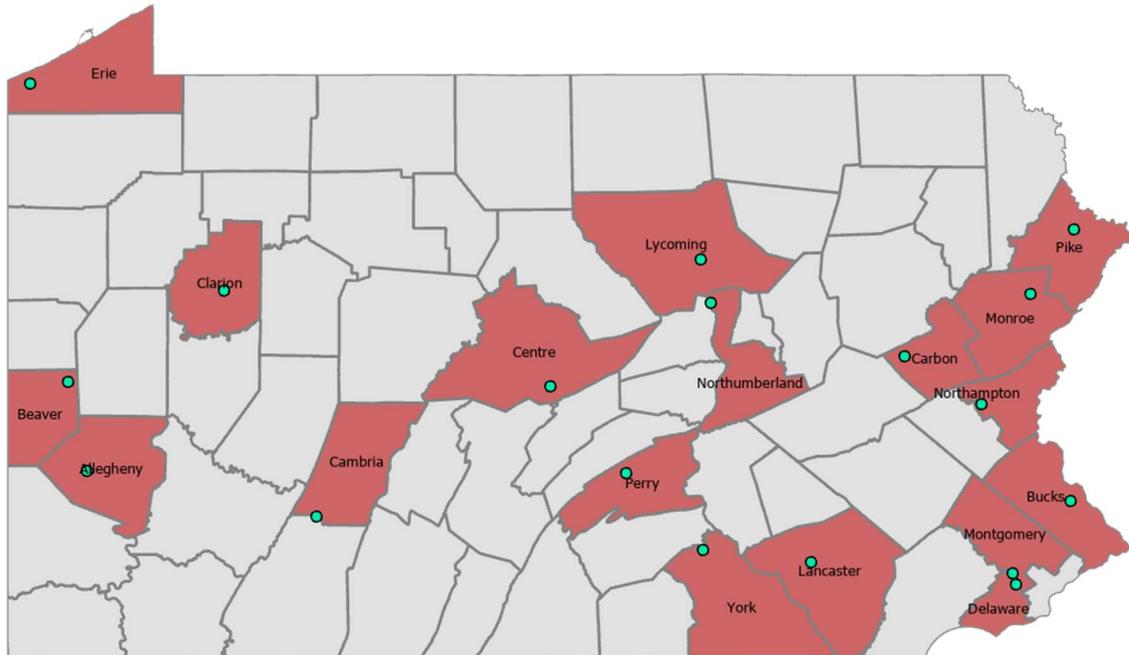


Walnut Twig Beetle survey trap locations 2020

**BOX TREE MOTH:**

In response to the detection of box tree moth (*Cydalima perspectalis*) in Toronto, Ontario, Canada in November 2018, PDA conducted a first ever box tree moth survey in Pennsylvania in 2020. Survey crews established 18 traps, at locations supporting boxwood nursery stock or boxwood ornamental plantings, in the summer of 2020. Crews collected trap samples until the end of October 2020. 127 samples were submitted to the PDA lab, from which 48 specimens were identified. No box tree moths were detected in 2020.

- 18 trap sites in 18 counties
- 18 trap locations
- 127 samples
- 48 specimens identified
- 0 target pests identified



Box Tree Moth survey trap locations 2020

**APIARY PERMITS ISSUED:**

The Pennsylvania Department of Agriculture (PDA) issued 38 Certificates of Inspection to process export permits for beekeepers requesting permission to allow honey bees and/or used equipment to leave PA. All hives and equipment leaving PA were also inspected for Spotted Lanternfly (SLF) whether the bee yard was in a quarantined county or not. The beekeepers were instructed on what to look for and how to kill any SLF they saw on equipment and/or vehicles. Many also have taken the online training and testing to increase their awareness of SLF.

**APIARY INSPECTION PROGRAM:**

The value of the apiary industry in Pennsylvania in 2020 was estimated at more than \$76 million. Much of this value is attributed to increased yield in crops partially or completely dependent on honey bees for pollination. In 2007, it was estimated that each honey bee colony provided \$1,659.21 to Pennsylvania’s economy.

Since the onset of Colony Collapse Disorder (CCD) in 2006, more people worldwide have become interested in becoming beekeepers and helping native pollinators. Currently in PA more than 5,700 registered beekeepers manage over 56,000 colonies in approximately 7,900 bee yards. The majority of these beekeepers care for 1-10 hives.

Managed honey bee colonies can be found almost everywhere in the Commonwealth from roof tops in urban areas to towns, suburbs, farms, and undeveloped land. From mid-May until the first week in November, there were seven full-time seasonal Apiary Inspectors working across Pennsylvania, as well as the State Apiarist, located in Harrisburg. The Apiary Inspectors conducted approximately 1,100 inspections in 2020, inspecting the colonies of over 10% of PA's beekeepers.

Concerns and restrictions due to the COVID-19 pandemic did affect the apiary program in 2020. The inspectors were able to do apiary inspections, but they began six weeks later than planned and followed strict safety protocols. Fortunately the season went well and we were pleased that we could continue with our program.

### **HONEY BEE DISEASES AND PESTS:**

American Foulbrood (AFB), a highly contagious disease affecting honey bees, was detected in five colonies located in three bee yards in two PA counties in 2020 (Crawford and Allegheny Counties). The PA Department of Agriculture continues to focus on detection and treatment of AFB. All suspect cases of AFB were submitted to Harrisburg and then laboratory tested at the PA Department of Agriculture or sent on to the USDA lab in Beltsville, Maryland to confirm the diagnosis and to screen for resistance to antibiotics. The antibiotic Oxytetracycline hydrochloride, (trade name Terramycin) has been used for many years and some AFB strains have developed a resistance. In some cases, these resistant strains of AFB may be treated with the veterinary antibiotic tylosin (trade name Tylan). Many beekeepers chose to burn the infected hive(s) since the antibiotics do not kill the spores which cause AFB. Beekeepers wishing to treat honey bees with an antibiotic (Oxytetracycline and/or tylosin) must work with a veterinarian to obtain a prescription or veterinary feed directive (VFD).

The Varroa mite, *Varroa destructor*, continues to be found throughout Pennsylvania and most areas of the world. These insect pests of the honey bee are a serious concern to beekeepers because they vector viruses causing diseases and can weaken a colony enough to cause the bees to abscond or die.

Small hive beetles are found in most areas of Pennsylvania. They are more prevalent in the southern and central areas of the state.

### **NATIONAL HONEY BEE SURVEY:**

This was the tenth year that Pennsylvania was able to participate in the USDA/APHIS National Honey Bee Disease Survey (NHBS). The 2020 National Honey Bee Survey has three goals: 1) early detection of potentially invasive pests such as the exotic mite *Tropilaelaps* and problematic *Apis* species such as *A. cerana*; 2) continue to build the honey bee health surveillance dataset which provides critical long-term historical perspective of colony health; and 3) identify risk and

protective factors that predict colony health and operational success by connecting honey bee health measures over time and annual colony losses.

The 2020 National Honey Bee Survey (NHBS) began in July 2020 and ends in June 2021, with plans to divide the sampling into two sections, longitudinal sampling of 5 beekeepers and 14 general survey surveillance samples. Due to problems created by COVID-19, the longitudinal sampling was voluntary. Ideally, the longitudinal sampling would be conducted twice a season for each of 5 beekeepers, and the goal was for each state to have a total of 24 samples collected at the end of survey period. Hives sampled for the longitudinal study also have bee bread samples taken to be analyzed for 199 known pesticides.

In Pennsylvania, 18 samples were collected from 17 apiaries from July through September 2020. The apiaries represented a cross-section of operation types and sizes. Each of the 17 apiaries had a minimum of 8 colonies in the apiary. One set of the samples was a longitudinal study survey.

The apiaries were located in 15 counties spread out across Pennsylvania and covered a good cross-section of rural, suburban and urban environments. The counties included: Allegheny, Bedford, Bucks, Chester, Clarion, Clearfield, Columbia, Crawford, Dauphin, Elk, Erie, Lehigh, Mifflin, Philadelphia, and York.

Targeted pests, parasites and pathogens noted in this survey through visual inspection are: American Foulbrood, European Foulbrood, Sac Brood, Chalkbrood, Parasitic Mite Syndrome (PMS)/Snotty Brood, Deformed Wing Virus, Black Shiny Bees, Small Hive Beetle larvae and adults, and Wax Moth larvae and adults. The status of the queen was also noted on the data sheet.

Honey bee and “frame tapping” samples from each apiary are taken and preserved in alcohol. These samples were sent to University of Maryland where they were examined for *Varroa* mite load, *Nosema* spore count, and the presence of *Tropilaelaps* mites and *Apis cerana*.

Live honey bee samples were taken from each apiary for submission to the USDA-ARS BRL for molecular and visual analyses. The molecular and visual analyses include the following: Lake Sinai Virus-2 (LSV-2), Acute Bee Paralysis Virus (ABPV), Chronic Bee Paralysis Virus (CBPV), Deformed Wing Virus-A (DWV-A), Deformed Wing Virus-B (formerly known as *Varroa* destructor virus) (DWV-B), Kashmir Bee Virus (KBV), Israeli Acute Paralysis Virus (IAPV), Moku Virus (MV) and *Nosema ceranae*.

The five longitudinally sampled apiaries or up to 10 other apiaries also had samples of approximately 3 grams of fresh bee bread taken. These samples were frozen until shipped to University of Maryland. They sent the bee bread on to USDA Agricultural Marketing Service (AMS) in Gastonia, NC for analysis of 199 known pesticides.

Sample collection and apiary inspection was begun July 2020 and completed for the calendar year in September 2020 with 18 samples collected and submitted. The six remaining samples, which includes two with bee bread, will be completed and shipped by June 30, 2021.

#### **NATIVE AND NONNATIVE BEE AND WASP SURVEY:**

Asian Giant Hornet, *Vespa mandarinia*, (AGH) gained national notoriety when it was discovered in Canada and Washington state late in 2019. This discovery emphasizes the importance of being prepared for the arrival of invasive insects.

The objectives of this project are to develop an inexpensive, user-friendly surveillance survey for early detection of exotic wasps and bees, by creating a trapping system that can be deployed in various locations and to gather information on wild native bees.

A number of states have participated in this survey for several years by following a standardized exotic wasp and bee survey system involving a trapping trial which tests the efficacy of the commercially available and commonly used blue vane traps and white plastic 1-gallon jug traps. Each volunteer selected three locations of their choice. There were two blue vane traps and one jug trap at each location. (Each received a total of 9 trap - 3 jug traps and 6 blue vane). The traps were baited using the appropriate amounts of a dark brown sugar and water solution (1 cup packed dark brown sugar added to 1 gallon of water). One of the blue vane traps also had 1 teaspoon of yeast added to the brown sugar solution to see if the increased fermentation affected the catch.

If, as we suspect, these traps are successful for surveying for bees and wasps, the combined trap can be deployed as part of an inexpensive surveillance trapping system in subsequent years. We are working on compiling statistics and creating a power analysis for the data collected over time.

#### **NATIVE BEE SURVEY:**

Native bee surveys were conducted in Pennsylvania from 2008 through 2013. Due to concerns about *Bombus affinis*, the Rusty Patched Bumble Bee, a scaled-back version of the PA Native Bee Survey (PANBS) was revived in 2017 and has continued through 2020. Apiary Inspectors established a site for the season, placing 5 yellow and 5 blue cups for 8 or more hours, every two weeks.

#### **PENNSYLVANIA'S POLLINATOR PROTECTION PLAN (P4):**

In 2014, the Environmental Protection Agency (EPA) directed state agencies to develop pollinator protection plans to mitigate risk to honey bees and other pollinators. This was one part of the federal government's plan to help pollinators. While the guidelines for the state pollinator plans

are voluntary and not regulatory, the P4 has several goals, including increasing knowledge and communication between farmers, pesticide applicators, beekeepers, and the public about pollinators. While pollinator protection plans were originally geared to managed pollinators, PA and many other states realized the value of native pollinators and expanded the plans to include all pollinators.

Dr. Christina Grozinger, Director of the Center of Pollinator Research at Penn State University worked with PDA to organize a task force and advisory groups to contribute to the plan, editing the input from more than 36 individuals representing 28 state organizations, national organizations, and stakeholder groups. The P4 is housed on the Penn State Center for Pollinator Research's website, with links from PDA and numerous other websites. Various members of this task force met virtually in 2020 to continue work on P4 goals.

#### **BEE CHECK:**

Pennsylvania beekeepers and specialty crop growers can now register online on the Bee Check and Drift Watch sites (Field Watch). This website serves as a voluntary communication tool for crop producers, beekeepers, and pesticide applicators to work together to protect specialty crops and apiaries through the use of mapping programs.

#### **PLANT DIAGNOSTIC SAMPLE REPORT (PDSR):**

In support of the PDA Plant Merchant Program, the Entomology Lab identifies Plant Inspector-collected samples from routine plant merchant inspections where a pest of regulatory concern is suspected. In addition, plant inspectors are asked to target certain pests of concern during their inspections. A total of 39 samples were submitted to PDA, with boxwood leafminer, *Monarthropalpusi flavus*, the most common submission.

#### **GENERAL SURVEY SAMPLES AND OTHER DETECTIONS OF NOTE:**

In addition to the Entomology Program's regulatory and funded surveys, samples from cooperative extension, private industry, and the public are also submitted for identification. The program records these samples as GENERAL SURVEY samples. The majority of these are submitted by commercial pest control companies and private citizens. Samples from this survey can lead to early detections of new pests to PA.

In 2020, PDA received 16 samples totaling 136 specimens from 13 counties. Notable finds include the flat bug (Aradidae) *Mezira subsetosa*, Lily leaf beetle (*Lilioceris lillii*), and the Harlequin Roach (*Neostylopyga rhombifolia*).

Asian Gypsy Moth (AGM) *Lymantria dispar asiatica* is an invasive moth from parts of Asia (Russian Far East, northern China, Central Asia, and the Korean Peninsula). The females of this gypsy moth, unlike the European gypsy moth (EGM) already in Pennsylvania, can fly up to 20

km raising the risk of establishment once moved. The AGM also have slightly different host preferences which would put additional stress on Pennsylvania's forests. A series of samples was turned into Penn State Cooperative Extension when moth and egg cases were discovered in imported packaging. The moths and egg cases were referred to USDA testing facilities where the moths, nearly identical to EGM, were identified using genetic markers. Surveys were subsequently conducted by the USDA to ensure that AGM did not establish in the environment. A total of 439 moths were captured with 397 being EGM and 42 with unknown identities. The area will continue to be surveyed to ensure this pest does not establish.

#### **PDA INSECT REFERENCE COLLECTION:**

The PDA Entomology program maintains an active and growing collection of insects of agricultural importance. This collection serves as a reference tool for identification and a resource for historical information on insects of Pennsylvania and the mid-Atlantic states. The collection seeks to improve its holdings in both areas of agricultural importance as well as areas in need of curatorial improvement.



*Pogonocherus penicillatus*

The collection added over 1,000 new specimens with emphasis on bees (Apoidea), longhorn beetles (Cerambycidae), and various other wood destroying beetles. Over half of the added material were bees added from native bee surveys in Pennsylvania and the United States as well as bycatch from other PDA surveys. Other notable additions to the collection were first additions of *Pogonocherus penicillatus* and *Orthotomicus latidens* (MA), and a second specimen of *Sachalinobia rugipennis*. A portion of the Asian Gypsy Moth specimens detected this year were also added.



*Orthotomicus latidens*



*Sachalinobia rugipennis*

**INVASIVE SPECIES HOTLINE, SLF REPORTING APP, AND E-MAIL REPORT SYSTEM  
([BADBUG@PA.GOV](mailto:BADBUG@PA.GOV)):**

In 2020, the invasive species hotline, [badbug@pa.gov](mailto:badbug@pa.gov) email account, and the SLF reporting application generated 88,598 records with the majority being SLF. This was the second year PDA Entomology utilized an online reporting tool to track an invasive insect, accounting for over 82,000 of the reports. The reporting tool is hosted by Penn State Extension which also provides users with immediate access to resources for homeowners and businesses, further streamlining the experience.

Over 900 voicemails were left with our hotline 1-866-253-7189. Reports of Asian Giant Hornet also saw a surge with their detection in the state of Washington. Badbug received over 4,800 emails with peaks in activity corresponding to AGH entering the mainstream in the spring and later in the fall when European Hornets became more active.