

# Pennsylvania Department of Agriculture

## 2014 Entomology Program Summary

The Pennsylvania Department of Agriculture (PDA) Entomology Program is responsible for the regulation of invasive insect plant pests, which includes survey, laboratory analysis, and control/mitigation when warranted. In 2014, the Entomology Program either conducted or actively participated in 13 invasive insect pest surveys across the Commonwealth. The laboratory received and processed 8,600 different insect samples and identified 99,380 specimens from these samples. Regardless of the survey, all samples were screened for Cerambycidae, Buprestidae, Scolytinae, Pentatomoidea, Siricidae, Symphyta, Apoidea, and other select species like *Drosophila suzukii* (Spotted Wing Drosophila), *Sirex noctilio*, *Larinus turbinatus*, *Adelges tsugae* (Hemlock Woolly Adelgid), and *Pyrhalta viburni* (Viburnum Leaf Beetle). In addition, several other non-targeted species were identified if they were unfamiliar to staff taxonomists. 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 general public.

### **ASIAN LONGHORNED BEETLE (ALB):**

This pest continues to be a high priority for Pennsylvania. ALB was declared eradicated from portions of New York, New Jersey, and Ontario in 2013. Unfortunately, new populations of ALB were discovered in New York and Ontario. Pennsylvania continues to screen all wood destroying insect samples for ALB, all of which were negative in 2014. In addition, ALB visual surveillance is performed as part of Pennsylvania's Cooperative Agricultural Pest Survey. PDA also responds to a number of public reports for ALB each year. In 2014 PDA performed visual and trap surveys at six high-risk sites. No ALB was detected in PA in 2014. PDA intends to continue visual surveillance in 2015.

### **WAREHOUSE LIGHT TRAP SURVEY:**

In May of 2014, the USDA-APHIS PPQ office out of Carlisle PA, established nine light trap sites at warehouses in four PA counties that receive shipments of products originating outside of the United States. Facilities targeted were known to have received shipments that contained pests from abroad in the past. The traps were serviced every two weeks until the end of August. A total of 90 samples were submitted to the PDA Entomology Laboratory for analysis. This survey targeted a combination of 22 different beetles and moths not known to occur in the United States. None



of the USDA target pests were detected, but one Bostrichidae species not native to PA, *Scobicia suturalis* (HORN), was detected on four separate occasions at a site in Allegheny County. References indicate records of this species from California being collected from dead grape vines. Bostrichidae are considered to be non-actionable pests. One of the sites trapped in 2014 was the interior of a facility where the longhorned beetle *Psacotheta hilaris* (Pascoe) was intercepted in PA three years ago. The site has now been monitored for three seasons with no additional detections of the pest.

### GRAPE COMMODITY PEST SURVEY:

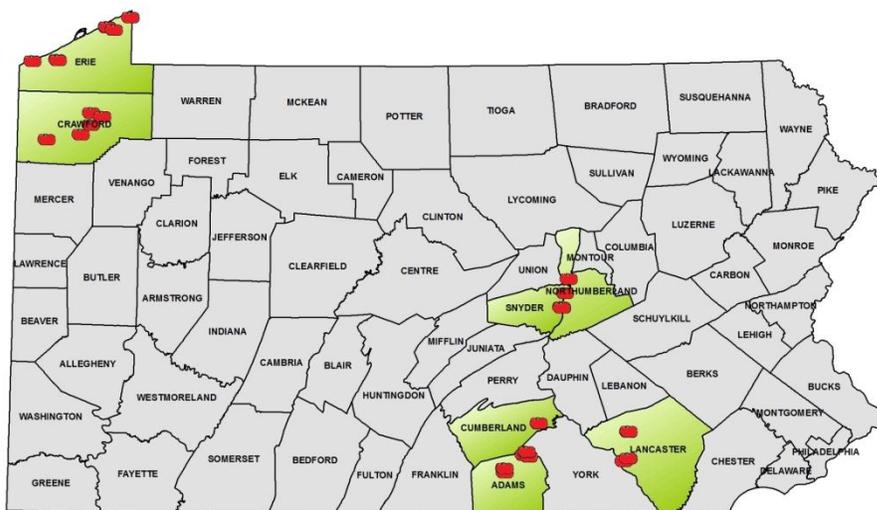
PDA first implemented a grape pest survey in 2010 using Farm Bill money from the USDA and this survey has been continued through 2014. The survey was run from April until the end of June, completing the 2013 project, and the 2014 grape commodity pest survey started on July 1st and ran until the end of September. The 2014 project will resume in April of 2015 and conclude June 30, 2015. Target pests in 2013 included *Autographa gamma* (silver-Y moth), *Lobesia botrana* (European grape vine moth), *Spodoptera littoralis* (Egyptian cotton leafworm), and *Heteronychus arator* (black maize beetle).

The moths were surveyed using pheromone baited traps and *Heteronychus arator* was visual survey only. None of the four target pests were detected. Targets for the 2014 survey include *Lobesia botrana*, *Autographa gamma*, *Epiphyas postvittana* (light brown apple moth), *Adoxophyes orana* (summer fruit tortrix moth), and the recently detected *Platynota stultana* (omnivorous leafroller). In 2014, survey crews established 244 sites in eight PA counties at farms supporting wine and juice production. The PDA lab received and processed 1,031 samples which contained 797 specimens. No targets were detected in 2014. Surveys did detect six specimens of *Duponchelia fovialis* (European pepper moth) in *Platynota* traps in Lancaster County. This represented the first records of this pest in PA. The newly introduced weevil *Larinus turbinatus* was also detected in one *Platynota* trap in Lancaster County. Eighteen specimens of native *Platynota* were collected from *Autographa*, *Lobesia*, and *Epiphyas* traps. Three specimens of *Autographa* which were not *Autographa gamma* were collected in *Lobesia*, *Platynota*, and *Autographa* traps. Due to the late season detection of a new grape pest, *Lycorma delicatula*, survey sites will be shifted and the pest will be added to the target list in 2015.



### TOMATO COMMODITY PEST SURVEY:

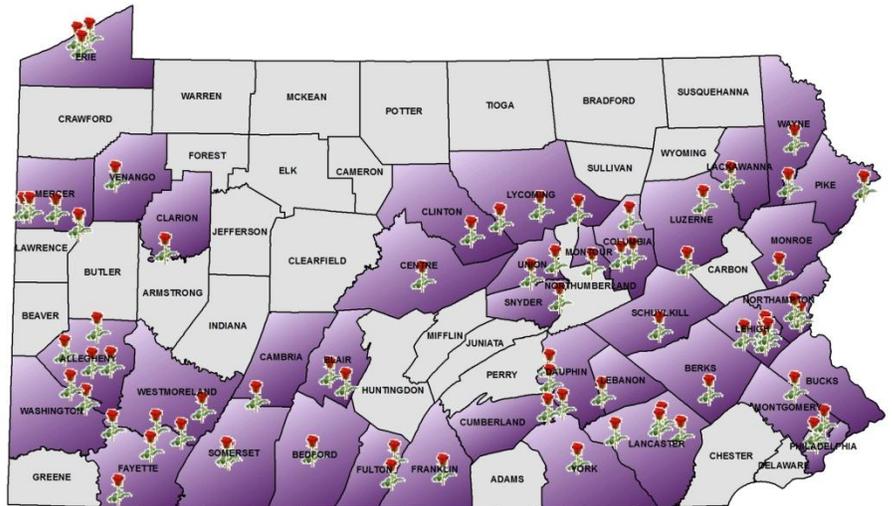
Due to numerous new detections of the tomato pest, *Tuta absoluta* (Family Gelechiidae) in Europe, a small survey for this pest was conducted through the PDA IPM program in 2010. In 2011, PDA received Farm Bill money to implement an official tomato commodity pest survey in PA and this was continued through 2014. Similar to the grape commodity survey, the tomato survey runs from July 1, through the end of September, and resumes from April through the end of June the following year. The 2013 project target pests were *Tuta absoluta* (tomato leaf miner) and *Chrysodeixis chalcites* (golden twin spot moth), a moth pest recently detected in Ontario, Canada. In July, for the 2014 project, two additional pests were added, *Diabrotica speciosa* (cucurbit beetle) and *Bactericera cockerelli* (tomato/potato psyllid). Seasonal surveyors deployed 185 sites in seven counties at tomato processing facilities, retail food distribution centers, as well as at some tomato production sites. Surveyors submitted 1,028 samples throughout the 2014 season that had contained 7,164 specimens, all of which were



negative for the target pests. Traps did collect 13 specimens of other moths in the Family Gelechiidae that were not *Tuta absoluta*. Traps collected a new county record of the bark beetle *Scolytus schevyrewi* (banded elm bark beetle) in Snyder County. Two specimens of *Diabrotica* were captured and were determined not to be *Diabrotica speciosa*. A total of 11 specimens of *Psyllidae* were collected but none were determined to be *Bactericera cockerelli*. This survey will resume in April of 2015.

### CUT FLOWER SURVEY:

For many years PDA has worked closely with members of the US Custom and Border Patrol sharing information which leads to the detection of new invasive plant pests. As part of the effort, PDA reviews port interception reports to help identify interception trends and pathways for plant pest introductions. In the past several years *Thysanoptera*, also known as thrips, had been routinely intercepted on shipments of cut flowers. As a pilot survey in 2013, PDA plant inspectors



were asked to sample cut flower shipments the week of February first, focusing on thrips. Inspectors visited nine cut flower distributors in six counties, where they generated 46 samples. The samples contained 80 insect specimens, including beetles, flies, aphids, and the target, thrips. Two of the thrips identified were not native to PA, including *Thrips palmi* and *Frankliniella panamensis*. Though these collections are considered to be interceptions requiring no regulatory action, they do demonstrate that a possible pathway for introduction exists.



In 2014, the survey was slightly modified to see if serious pests like *Thrips palmi* can survive past the distributor, and remain viable to the flowers retail destination, where the likelihood of transfer to plants for planting is increased. Inspectors visited 83 sites in 38 counties in 2014. A total of 493 samples were submitted that contained 65 specimens. The most interesting detection was a larval specimen verified as *Coptotarsia decolora* intercepted from Allegheny County on a shipment of *Alstroemeria* from Columbia. This is an actionable pest, though most risk assessments indicate that the species is unlikely to survive in PA. This survey is scheduled to continue in 2015.

### EMERALD ASH BORER (EAB):

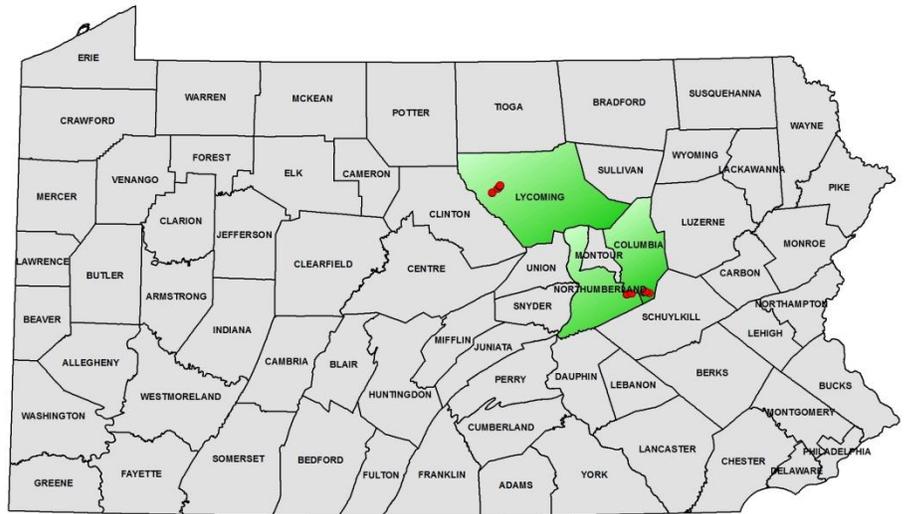
2014 marked the seventh year since the Buprestidae beetle *Agilus planipennis* was discovered in Butler County and the fourth year since the removal of the in-state quarantine which had restricted the movement of materials from known infested areas to non-infested areas. It was also the fourth year of bio-control efforts by our cooperating agency (DCNR), and the fourth season of the tropical ash rearing project to support the production of bio-control agents. At the beginning of 2014 there were 47 counties with confirmed populations of EAB known in PA, and no official survey work was performed by PDA in 2014.



baited traps. Risk is determined by pathway analysis and cooperation with USDA-APHIS and input from the PA state CAPS committee. Traps are run from April through the end of September. Each trap is serviced every two weeks, which generated a total of 1,400 samples and 29,031 specimens. Fortunately no targets of national concern were detected in 2013. Detections of note included 26 *Anisandrus maiche*, a hardwood ambrosia beetle new to the country in 2006, 11 *Scolytus schevyrewi* (banded elm bark beetle), 2 *Sirex noctilio* for the first time from Clearfield County, and 90 *Cnestus mutilatus* from Montgomery and Lehigh Counties. Visual survey points were taken at all sites and several additional locations, totaling 68 visual survey sites for pests that are visual survey only. All visual surveys were negative for target pests. This survey will be implemented again 2015 targeting different pests and new high-risk locations.

**OTIS TRAP EFFICACY SURVEY:**

PDA has assisted the USDA-APHIS OTIS lab with the development of traps for several years. In 2014, PDA received funding to run traps sites to test design and lure combination efficacy for trapping EAB and other wood destroying insects, particularly Buprestidae. As part of the agreement PDA was also asked to process the samples from sites in Maryland and Michigan for this study. In PA, 48 traps were established at sites in three counties. Sites were run from May through the end of September, and serviced every two weeks.

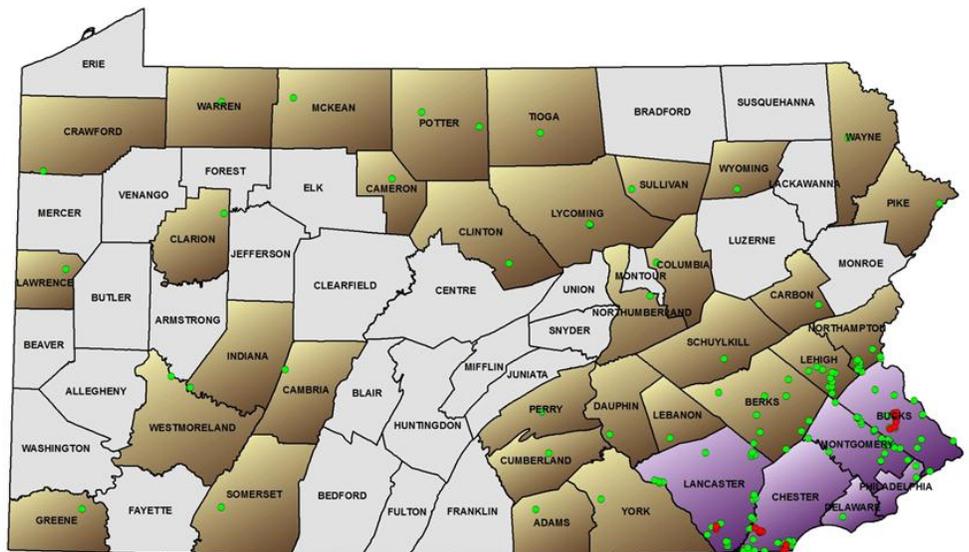


A total of 1,787 samples containing 15,658 specimens were received and processed by PDA from all three states. In PA, the study collected 5,688 specimens. Of these, 256 were from the family Buprestidae, and 163 of those belonged to the genus *Agrilus*. A total of 27 were EAB. Evaluation of the traps and their efficacy will be performed by the lead researchers from the OTIS laboratory.

**WALNUT TWIG BEETLE (TCD):**

In August of 2011, Penn State Cooperative Extension in Bucks County obtained a sample of dying black walnut. The cause of the dying walnut was confirmed as Thousand Cankers Disease, a disease complex caused by a twig beetle, *Pityophthorus juglandis*, (WTB) 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 started a state-wide trap survey for the beetle. PA received Farm Bill support to run a 100 trap survey for the beetles starting in July of 2012 and this survey

**2014 PENNSYLVANIA WALNUT TWIG BEETLE SURVEY SITES**



■ COUNTY WITH SURVEY ■ QUARANTINED COUNTY ● NEGATIVE SITE ● POSITIVE BEETLE SITE

continued through 2014. Late in 2013, the state of Maryland announced the detection of the WTB in Cecil County, extremely close to the PA border with Chester County. As a result, several of the programs available traps were placed in southern Chester County. PDA deployed 170 traps in 38 counties in 2014. In addition, the DCNR placed and monitored several traps in Bucks County and the state of MD requested assistance with the processing of samples from MD. In all, PDA received and processed 1,621 samples containing 38,134 specimens. A total of 14,648 *Pityophthorus juglandis* were collected in 2014. The majority of specimens were from the original site in Bucks County which continues to produce large numbers of beetles. Unfortunately eight sites in Chester County had positive detections for WTB, which led to the expansion of the existing TCD quarantine to include Chester, Delaware, Montgomery, and Philadelphia. Several traps were redeployed from Chester County to Lancaster County mid-way through 2014 when the 2013 farm bill project concluded and the 2014 farm bill project began. This led to the detection of WTB at two sites in Lancaster County which was then added to the quarantine. New positive locations in Chester and Lancaster did not display signs of dieback or mortality similar to those seen in Bucks County, making detection of the fungus difficult. For the detection of *Geosmithia morbida*, it was necessary to place bolt traps for a period of 30 days which yielded both beetles and fungus, demonstrating the presence of the causal agents for TCD. PA will resume the 2014 project in April of 2015, shifting traps to counties bordering the quarantined zone.

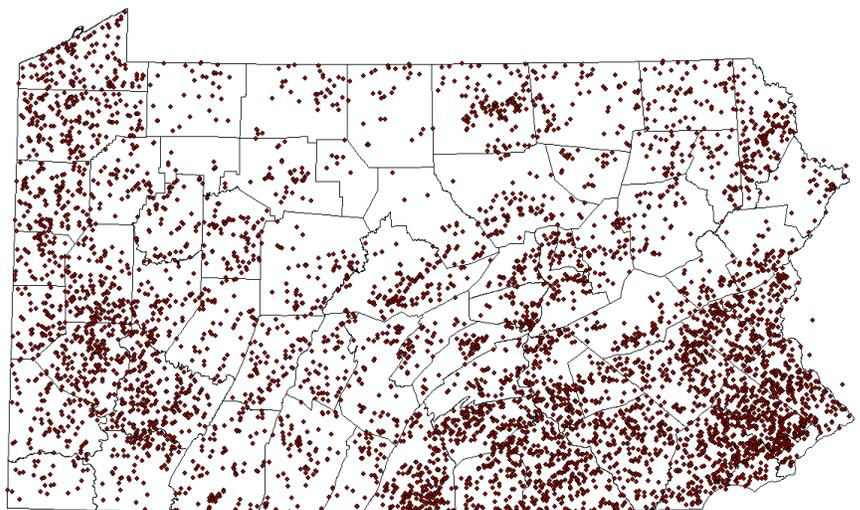
A number of notable detections were made as a result of WTB trapping. A trap in Lancaster County captured a specimen of *Xyleborinus gracilis*, a bark beetle native to the Southern US, which was new to the state in 2013. A trap from Lehigh County detected *Cnestus mutilatus* (Camphor Shot Borer) from a second site. Traps in Chester and Bucks Counties also collected the bostrichid beetle, *Dinoderus japonicus*, which was discovered as new to the state in 2013. The Platypodid beetle *Euplatypus compositus* was collected from Lebanon County for the first time, and *Scolytus schevyrewi* was collected from Philadelphia, Montgomery, Northampton, Bucks, and Lancaster Counties.

#### **APIARY INSPECTION PROGRAM:**

The value of the apiary industry in Pennsylvania in 2014 was estimated at over \$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. In Pennsylvania, over 3,000 new beekeepers have registered since 2007, including over 500 new beekeepers registering in 2014. Currently, in PA there are approximately 3,300 registered beekeepers. The majority of these beekeepers care for 1-10 hives. As seen on the map, 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 the end of April until the end of October, there were six full time seasonal Apiary Inspectors working across Pennsylvania as well as the State Apiarist located in Harrisburg. Over 6,600 colonies located in more than 1,250 apiaries (bee yards) were inspected. Approximately 19% of (about 740) beekeepers registered in PA had their honey bee colonies inspected.

**APIARIES REGISTERED IN PENNSYLVANIA**



In several areas in eastern PA, beekeepers and inspectors reported seeing blue-green nectar and honey in honey bee hives. While plants will naturally produce different colors of nectar, the colors seen in these hives was unusual. A sample was sent to a lab for testing to be sure that the bees had not collected anti-freeze (ethylene glycol or other alcohols) or liquid containing nonfood blue dye (Copper). These chemicals were not detected and samples will be sent for pollen analysis.

### HONEY BEE DISEASES AND PESTS:

Six cases of American Foulbrood (AFB), a highly contagious disease affecting honey bees, were detected in PA in 2014. 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 sent on to the USDA, Beltsville, Maryland for laboratory testing to confirm the diagnosis and to screen for Oxytetracycline HCL resistance. Three of the AFB strains were susceptible, and therefore treatable with the antibiotic Oxytetracycline HCL, two were resistant to Oxytetracycline HCL,

and one strain was inconclusive. Resistant strains of AFB may be treated with different antibiotics or irradiated. Many beekeepers chose to burn the infected hive(s) since the antibiotics do not kill the bacterium causing AFB. The Varroa mite, *Varroa destructor*, continues to be found throughout Pennsylvania and many parts 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 continue to spread throughout Pennsylvania.

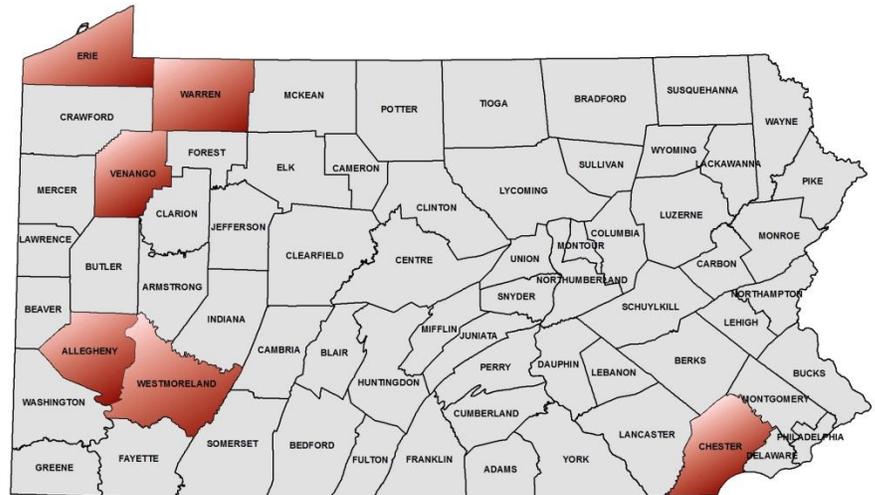
### PERMITS ISSUED:

The Pennsylvania Department of Agriculture (PDA) issued 35 Certificates of Inspection to process export permits for beekeepers requesting permission to allow honey bees and/or used equipment to leave PA (43 were issued in 2014). There were 12 Import Permits issued to allow honey bees and/or used equipment to enter PA from other states (12 were issued in 2013). Fifty three queen producer/nuc-selling beekeepers were issued permits to sell queens and nucleus colonies in Pennsylvania in 2014 (53 were issued in 2013).

### NATIONAL HONEY BEE SURVEY:

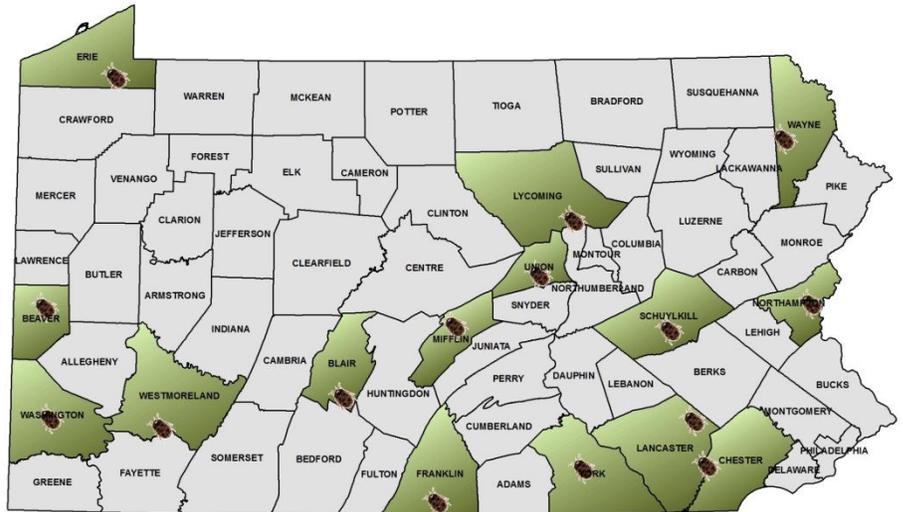
This was the fifth year that Pennsylvania was able to participate in the USDA/APHIS National Honey Bee Disease Survey (NHBS). The objective of this survey is to determine the diseases, pests, and parasites present, or absent, in various operations throughout the United States, including a cross-section of operation types. The diseases, pests, and parasites include: American Foulbrood, European Foulbrood, Sacbrood, Chalkbrood, Parasitic Mite Syndrome, Deformed Wing Virus, Black Shiny Bees, Small Hive Beetles, Wax Moths, *Varroa* mites, *Nosema* spores, and *Tropilaelaps* mites. The survey also records the status of the queen. Live bee samples are sent for virus testing. As of December 2014, 18 of the 24 apiaries have been sampled. The remaining six will be completed in the spring of 2015.

2014 PENNSYLVANIA COUNTIES  
WITH AMERICAN FOULBROOD



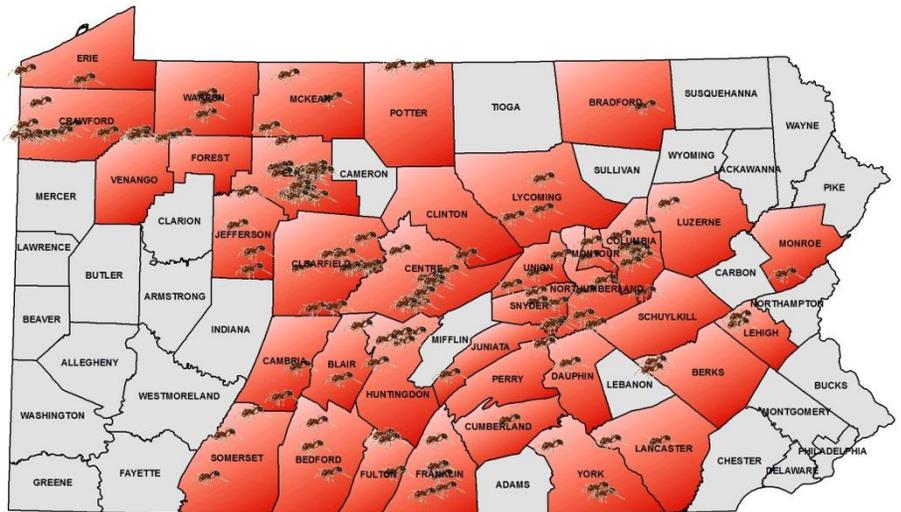
### **KHAPRA BEETLE SURVEY:**

Khapra beetle (*Trogoderma granarium*) is one of the most destructive invasive pests of grain and is often intercepted in imported grain products. In the past several years multiple interceptions of the pest in products like rice have been made all over the United States including an airport interception in Pittsburgh in 2013. PDA was awarded Farm Bill money to survey for this pest starting in July of 2013. PDA established 18 sites in 18 counties at grain facilities where Agronomic Product Inspectors deployed three traps each. Traps were serviced every two weeks and generated 261 samples in 2013. All trap samples were negative for *Trogoderma granarium* in 2013. The survey resumed in April of 2014 and inspectors established 15 different sites in 15 Counties. This survey concluded in June of 2014 when farm bill funding was discontinued. However, a few inspectors elected to continue running traps until supplies were used up in the fall of 2014. A total of 352 samples were generated by this survey that contained 73 specimens of the family Dermestidae. None were identified as *Trogoderma granarium*. PDA has no plans to run this survey in 2015.



### **IMPORTED FIRE ANT SURVEY:**

The USDA-APHIS PPQ office in Carlisle often conducts a survey for exotic fire ants, primarily *Solenopsis invicta*, and PDA processes the samples for this survey. In 2014, PDA Apiary inspectors assisted APHIS by conducting fire ant surveys as part of a percentage of their routine inspections. Focus was given to apiaries that had colonies which spent time in known fire ant infested areas for pollination services. Apiary inspectors established 140 sites in 37 counties. The survey generated 114 samples, which contained 2,152 specimens of the family Formicidae. None of the specimens were identified as *Solenopsis invicta*.



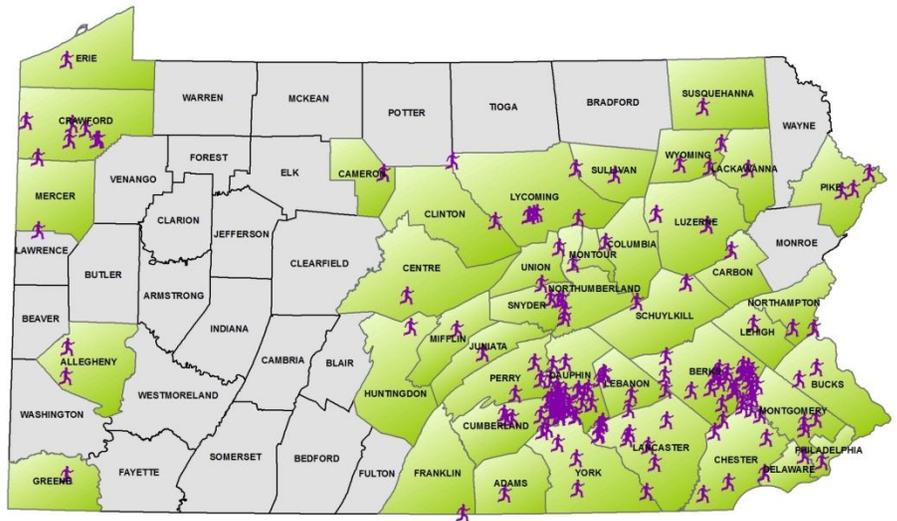
### **PLANT DIAGNOSTIC SAMPLE REPORTS (PDSR):**

In support of the PDA Plant Merchant Program, the Entomology Lab processes plant inspector collected samples from routine plant merchant inspections where a pest of regulatory concern is suspected. A total of 227 samples were submitted in 2014. The most commonly submitted pest was *Platynota stultana*, (Omnivorous leafroller) which was found causing significant damage to Cyclamen in a commercial greenhouse from the first time in 2013. Voluntary trapping was conducted by the facility in 2014 which yielded 30 positive samples. No other samples of this new pest were submitted from other locations. The same facility also developed a problem with *Duponchelia fovealis* (European pepper moth) and also started trapping for this

pest after it was discovered in traps from a Farm Bill survey placed on the exterior of their property. *Duponchelia fovealis* was also not submitted from any other location.

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

In addition to mandated and funded surveys, the PDA Entomology program also receives samples from cooperative extension, private industry, and the general public. Entomology records these samples as GENERAL SURVEY samples. The majority of these types of samples result from Commercial Pest Control submissions and Cooperative Extension. In 2014, PDA recorded 297 samples totaling 1,136 specimens. Most identifications provided for the general survey were of common household or yard pests. Two significant finds resulted from the general survey in 2014, and unknown Cerambycidae and a Fulgoridae new to the continent.



A rental property management group submitted live samples of an unknown insect to Dr. Kelli Hoover at Penn State University. Dr. Hoover submitted the sample to PDA where it was identified as an unknown species of the genus *Chlorophorus*, which was later confirmed by the Systematic Entomology Lab in Washington, DC. Two species of that genus are known pests and are targets for PDA CAPS surveys. A preliminary investigation discovered that the specimens had hatched out of new dormitory-style furniture imported from China. The property manager indicated that wooden furniture appeared to be made of green wood, and that a shipment was split between three separate locations in PA. All information was turned over to USDA-APHIS Smuggling Interdiction and Trade Compliance (SITC) and the matter is still under investigation.

### SPOTTED LANTERNFLY (SL):

On September 22, an educator with the PA Game Commission submitted a report detailing damage to *Ailanthus altissima* (tree of heaven) and the presence of an unknown insect associated with the damage in Eastern Berks County. An inspection by PDA staff resulted in the collection of a pest new to North America, *Lycorma delicatula* (spotted lanternfly). SL is a plant hopper native to China, India, and Vietnam and was introduced into Japan and South Korea. In South Korea, it spread rapidly after its introduction in 2006 and is considered to be an invasive pest. A literature review lists at least 70 known host plants, with the most significant agricultural damage occurring on species of grape. SL completes one generation a year. The insect overwinters as an egg mass of 30-50 eggs covered with a mud-like protective foam. The first egg masses



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positive grids being represented by only a few specimens. Land managers from state and federal agencies have met to discuss possible eradication or control methods. Most methods are still being evaluated, but scraping of egg masses and tree banding are methods that will likely be employed. A quarantine restricting the movement of the pest and its conveyances was implemented. Town hall meetings to discuss the quarantine and its implications were held. Outreach material was produced, and a web site was developed to assist with information sharing ( [www.pda.state.pa.us/spottedlanternfly](http://www.pda.state.pa.us/spottedlanternfly) ). The local community has formed a citizens action group and has been assisting with education of the community and is looking into assisting with control measures. PDA is hoping to obtain funding to work with the community on a banding and egg mass

scraping. Right now, citizens can report egg masses they have scraped, and view instructions for reporting from the SL website. PDA is hoping to implement a volunteer tree banding program in May of 2015. Citizens would be enlisted to deploy tree bands on their property and provide counts of insects trapped to an on-line database. Sticky tree bands have been used effectively in South Korea to control this pest and are relatively inexpensive and easy to deploy. The hope is that combined methods like egg mass scraping, tree banding, quarantine, and additional measures as they become available will act in concert to eliminate this pest before it spreads. In addition to support from the local community, local government, state, and federal agencies have assisted with resources. The DCNR and USFS have offered expertise and are attempting to provide accurate tree of heaven coverage maps. Studies to determine temperature tolerance and mitigation of egg masses are being conducted. Berks County has provided communications and logistical support. The PDA-PSU plant health resource center has provided funding for the production of outreach materials. Members of the local business community have also assisted by volunteering time and equipment for biological studies, and by working with PDA to alter practices to avoid the transportation of egg masses to new areas. Companies that have shipped out of the core infested area have provided shipping records, and these locations have been inspected and found to be free of SL.



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What we know is that we have a small, relatively contained, but established population. We have feeding damage on tree of heaven, grape, and weeping willow. We have evidence that the population has existed for at least two seasons and can survive here. We have identified several of the major pathways of spread and reintroduction, and have enacted a quarantine to eliminate those pathways. We know this pest has impacted grape production in South Korea. We have a great deal we still need to learn, but have started the process and are poised to attempt eradication of this new invasive pest.

#### **INVASIVE SPECIES HOTLINE AND E-MAIL REPORT SYSTEM:**

In 2014, the invasive species hotline and badbug e-mail account generated 304 contacts to report possible invasive insects. Of the 304 contacts, 226 were to the toll-free automated invasive species line and 78 were to the badbug e-mail. The majority of public contacts were to report or ask about EAB. Several residents of Berks County called to report or ask questions about *Lycorma delicatula* late in the year.