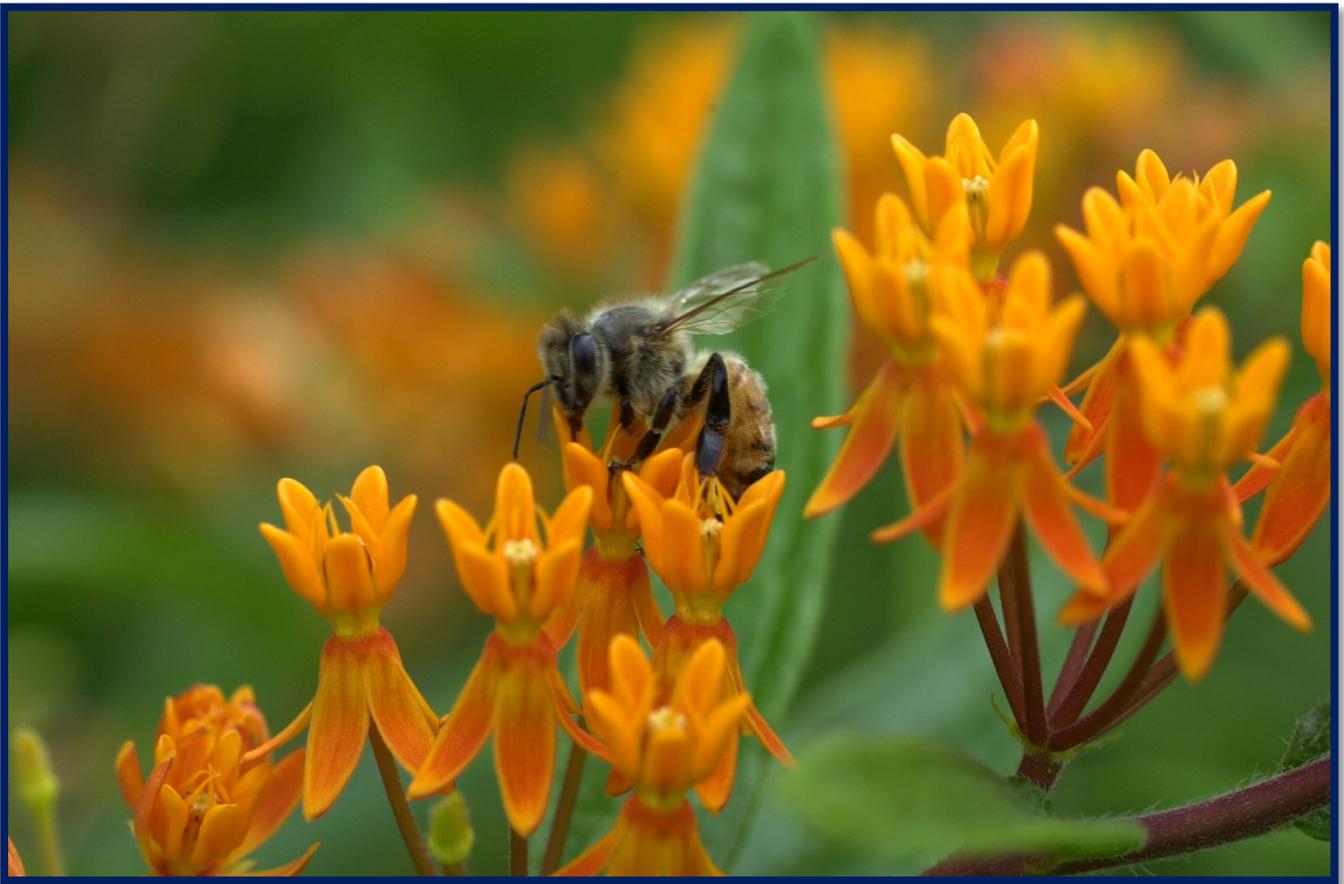




**pennsylvania**  
DEPARTMENT OF AGRICULTURE

**BUREAU OF PLANT INDUSTRY**  
**2015 PROGRAM ACTIVITIES OVERVIEW**



# PENNSYLVANIA DEPARTMENT OF AGRICULTURE

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# PENNSYLVANIA DEPARTMENT OF AGRICULTURE

## OUR MISSION

The Bureau of Plant Industry protects the commonwealth's plant resources and provides consumer protection and safety for Pennsylvania citizens by ensuring quality products and services through certification, licensing, product registration, survey/monitoring and inspection programs.

The bureau provides programs and services to maintain and protect Pennsylvania agriculture through its four divisions – Agronomic Services and Regional Programs; Health and Safety; Plant Health; and Entomology. These include detection, identification and control of destructive plant pests (diseases, insects and weeds, both native and exotic). The bureau administers laws and regulations relating to the distribution and sale of seed, feed, fertilizer, pesticides and liming materials. Additionally, Plant Industry administers the bee law, fruit tree improvement program, and the pesticide program including business licensing, testing and certification of individual applicators and investigating complaints of misuse. Staff works to promote farm safety, worker protection, surface and groundwater protection, endangered species protection, and integrated pest management.



## DIVISION OF AGRONOMIC AND REGIONAL SERVICES

This division is responsible for administering the animal food, fertilizer, seed, soil/plant amendment and lime programs and provides regional program supervision. This includes registration, sampling and inspection of these products, animal feed and pet food manufacturing inspections, consumer complaint investigations, product contamination inquiries, seed analysis and seed certification. Regional personnel, including supervisors and inspectors, are hired and supervised by this division. Support for regional staff is organized and maintained through the Division. The seed laboratory and seed collection are located in this division.

Agronomic & Regional Services is led by a division chief. There is one agronomic program specialist that is responsible for administering the feed, fertilizer, soil and plant amendment, and liming material laws. There is one seed program specialist that is responsible for administering the seed law as well as overseeing the operations of the seed program. The seed laboratory staff has one lab supervisor position, one seed analyst position and two laboratory technicians. The division is supported by two administrative clerical positions.

Field inspection staff, located in seven regions across the state, comprised of 11 agronomic product inspectors, 12 plant inspectors, five inspection technicians and six supervisors, respectively, are responsible for performing inspections and sampling products to ensure that consumers are receiving safe, effective and quality products. Our inspectors are the front line in providing for the protection of agriculture and horticulture from plant pests. Our inspectors help to ensure consumers are receiving safe and effective products such as animal feed, pet

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food, home and garden fertilizer, agricultural fertilizer, grass seed, flower and vegetable seed and other agronomic seeds. Current Personnel – 43 filled positions, 2 vacant positions in field inspection staff.

### Feed Program

There was a reported six million tons of commercial animal feed distributed in Pennsylvania in the calendar year 2015. We license Pennsylvania facilities and out of state facilities that are manufacturing and distributing animal feed, pet food or pet treats. They range in scope and size from international and national companies to home-based operations that produce dog treats in their kitchen. Inspections of these licensed feed facilities are conducted to ensure good manufacturing practices are followed and consumers are provided with truthful and accurate labeling for their feed and pet food products. These products are required to provide labeling with guaranteed components, such as crude protein, crude fat and crude fiber to the consumer.

Inspectors are responsible for inspecting feed manufacturers for compliance with the federal Bovine Spongiform Encephalopathy (BSE) Rule that prohibits the use of restricted mammalian protein in the feed of ruminants, such as cattle. BSE, or Mad Cow Disease, is a devastating disease that can be spread by the feeding of ruminant protein material to other ruminants. Through the implementation of the BSE rule and efforts of feed control officials and inspectors, both state and federal, we have helped to minimize the amplification and spread of BSE in the United States.

Inspectors and the agronomic program specialist will investigate feed contamination incidents and consumer complaints by conducting onsite inspections, interviews and obtaining necessary documentation such as product samples, invoices, labeling, distribution records, photographs and other forms of evidence.

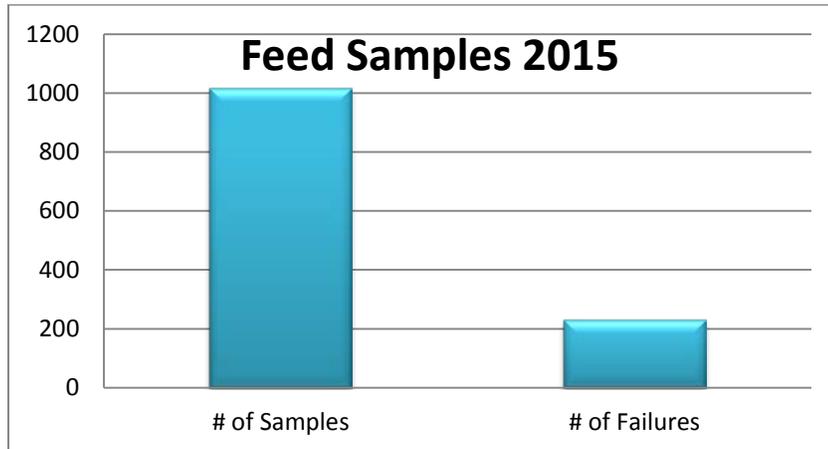
Our feed program and personnel are part of the department's Food Safety Rapid Response Team (RRT) that has been created through the award of a federal grant. The RRT helps to ensure that our department has developed and implemented policy and procedures that will assist in our response to and management of food or feed emergencies.

We partner with the Federal Food & Drug Administration (FDA) on complicated, multi-jurisdictional investigations at feed manufacturing facilities in an effort to combine our resources, time and experience. Our staff maintains FDA credentials in order to conduct Federal Good Manufacturing Practice inspections at medicated feed mills to ensure compliance with the manufacturing of medicated animal feed.

Physical samples of feed and feed ingredients are obtained to analyze for guaranteed components such as protein, minerals and medications. Physical samples are also obtained to test for possible contaminants. Feed contaminants can be biological, chemical or physical. Salmonella, mycotoxins, drug or pesticide residues, heavy metals, glass, and metal fragments are just a few of the potential feed contaminants that we survey or investigate in animal feed complaints. We conducted laboratory analysis on **1017** routine regulatory samples in calendar

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year 2015. Of those analyzed for components such as crude protein, minerals and medications **230** failed to meet the guaranteed analysis.



The program specialist maintains membership with and is a voting member of the Association of American Feed Control Officials (AAFCO). This national association is comprised of state and federal feed control officials. The association sets standards in feed and pet food regulations that are recognized nationally. States can adopt the Model Bill and Model Regulations into their own state authority in whole or in part. Pennsylvania participates on the national level in order to represent our feed program objectives of safe, effective animal feed and pet food and maintain uniformity of state feed regulations through AAFCO committee work and voting.

### Fertilizer Program

More than 700,000 tons of commercial fertilizer was reported as distributed in Pennsylvania for the 2014-2015 reporting period. A fertilizer is any substance, including fertilizer material, mixed fertilizer, specialty fertilizer and bulk fertilizer, containing one or more recognized elements, which is used for its plant nutrient content and which is designed for use or claimed to have value in promoting plant growth.

We license Pennsylvania and out of state facilities that manufacture and distribute fertilizers. Fertilizers include bulk materials that are used to blend final product, agricultural fertilizer, home and garden fertilizer products, turf fertilizer and other types of specialty plant nutrient products. A specialty fertilizer is a fertilizer distributed for non-farm use and fertilizer material primarily intended to supply plant nutrients other than nitrogen, phosphate, and soluble potash.

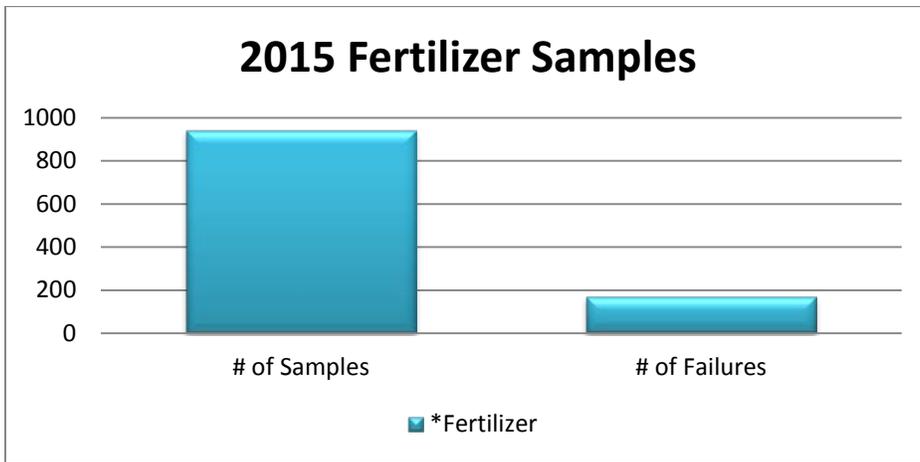
Specialty fertilizer products are regulated through the product registration to ensure consumer safety and product efficacy. Product labels are reviewed to ensure they comply with labeling requirements such as guaranteed nutrient analysis.

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Agricultural and specialty fertilizer samples are collected and analyzed to ensure products are currently registered (if specialty fertilizers), meet labeling requirements, and are not adulterated.

Physical samples of fertilizer and fertilizer ingredients are obtained to analyze for guaranteed components such as nitrogen, phosphorus and potassium and other plant nutrients. We conducted laboratory analysis on **942** routine regulatory samples in calendar year 2015. Of those analyzed for components such as nitrogen, phosphorus and potassium **241** failed to meet the guaranteed analysis.

Physical samples may also be obtained to test for possible contaminants. Ensuring human, animal and environmental safety is a critical component of the fertilizer program.



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Specialty fertilizer product registration has continued to grow with 2015 showing a total of **5,960** registered products.

## Fertilizer Advisory Committee

The twelve member committee was created by the Secretary of Agriculture to advise the secretary on matters and issues related or unique to the fertilizer industry. This may include manufacturing, testing, compliance or regulatory issues and concerns, needed or pending legislation, environmental problems, concerns, and agency programs.

Recommendations and votes of the committee on policy and other issues and matters serve only as advisory decisions and shall not be binding on the agency.

## Seed Program

The Seed Program of the Bureau of Plant Industry helps producers and growers through seed regulation and service seed testing. The seed regulatory program protects the industry and consumers through inspection and analysis of seed products in the marketplace. The service seed testing program conducts analyses for seed producers, researchers, farmers and gardeners to determine the quality of seed. The seed program administers the seed certification program to ensure genetic purity.

The Seed Act, from which the division derives its authority, requires all seeds to be properly labeled before being distributed in Pennsylvania. Information must appear on a tag or label attached in a conspicuous place on the exterior of the seed container.

During the 2014-15 fiscal year the laboratory received **9,761** samples that required **11,685** separate tests. Plant Industry Inspectors submitted **2,956** regulatory seed samples for enforcement of the Seed Act, and **45** regulatory samples to test for viable weed seed to aid in the enforcement of the PA Commercial Feed Act.

Farmers, wholesale seedsmen and retail outlets submitted **6,596** service samples for labeling purposes and guidance in planting.

### Seed Certification:

Seed certification ensures the quality of varieties of seeds grown and distributed in Pennsylvania so that only those meeting the quality standards claimed on their labels are made available to the public. Only after passing rigid field and seed standards can seed be labeled as a class of certified seed. The seed certification program and various other state agencies submitted **166** physical samples to determine if the seed met standards or specifications.

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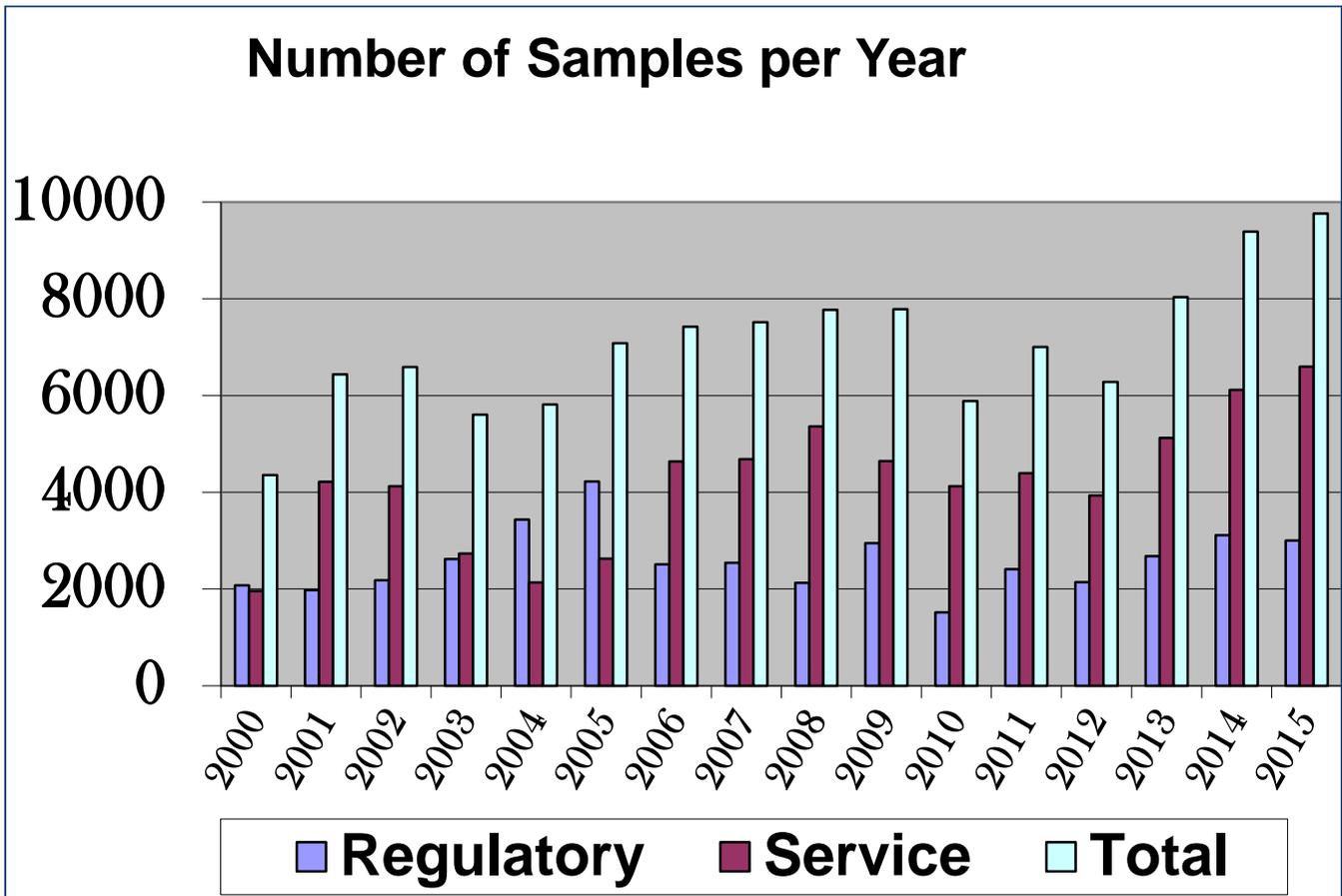
## Seed Testing Laboratory:

The Seed Laboratory provides technical information and performs a range of tests and analyses on seed samples from various sources. All seed samples are prepared and tested according to the “Rules for Testing Seeds” as approved and published by the Association of Official Seed Analysts (AOSA). Some of the tests that are provided for regulatory purposes include: purity, germination, and noxious weed seed.

Seed analysts also identify and test seeds for the Pennsylvania Department of Transportation, Department of Environmental Protection, Department of Conservation and Natural Resources, Bureau of Animal Health and Diagnostic Services, the State Police Crime Laboratory and the public.

The Seed Laboratory is an active member of AOSA and cooperates in work of various committees. A staff member attends the annual meeting of AOSA to vote on rule changes, discuss other items of business and attend committee meetings.

The Seed Laboratory is also an active member of the Association of Seed Control Officials of the Northeastern States and the Association of American Seed Control Officials.



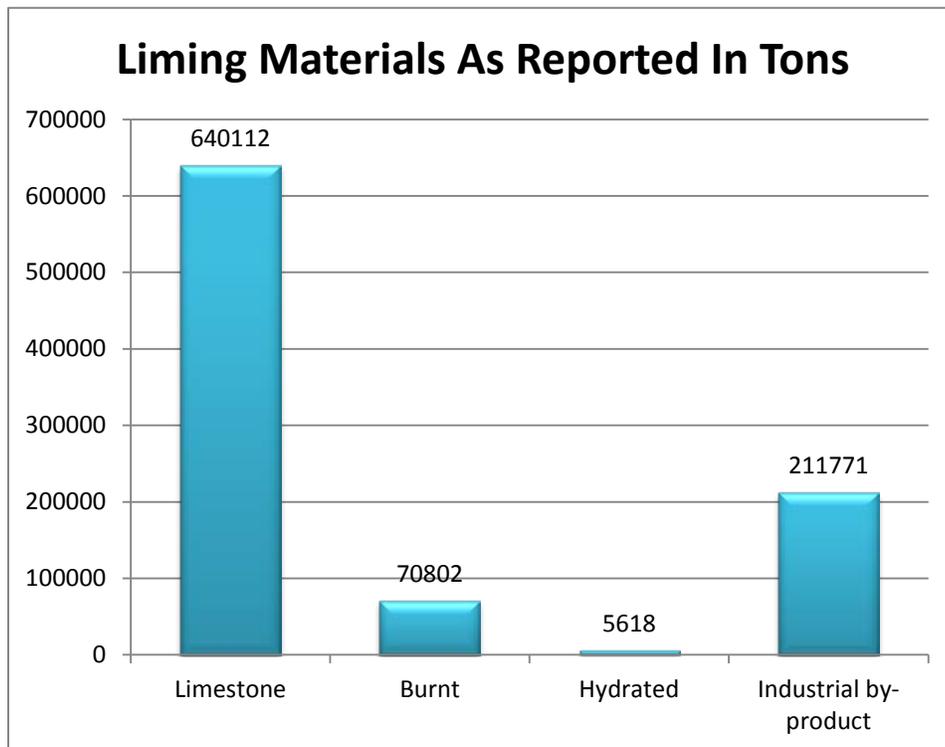
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## Regulatory Seed Samples for 2014-2015 Fiscal Year

KINDS OF SEEDS	# OF REGULATORY SAMPLES	% VIOLATIONS
Vegetable	1795	4.85%
Agronomic	378	5.29%
Flower	547	4.2%
Seeds for sprouts	15	46.67%
Pasture Mix	21	23.81%
Lawn Mix	124	35.48%
Vegetable Kit	26	3.85%

### Liming Material Program

Agricultural Liming Material is any product whose calcium and magnesium compounds are capable of neutralizing soil acidity. Agricultural Liming Materials help to improve soil properties which in turn enhance crop growth and yield. Liming materials are regulated through the licensing of PA manufacturing facilities and all guarantors of liming products.



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Inspection staff obtain physical samples at distributor and manufacturing locations which will consist of one of the 5 types of liming materials; limestone, hydrated lime, burnt lime, industrial by-product or marl and shells. The laboratory can analyze the sample for calcium, magnesium, calcium carbonate equivalent, effective neutralizing value, fineness, and moisture.

## Soil and Plant Amendment Program

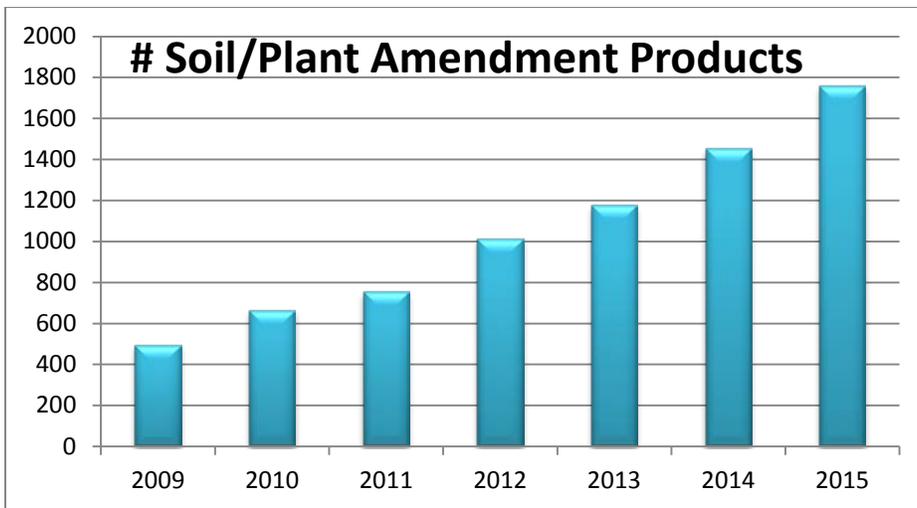
The Pennsylvania Soil and Plant Amendment Regulatory Program ensure consumers receive safe/effective soil and plant amendment materials that meet the quality and quantity guaranteed by the manufacturer/guarantor.

Inspectors conduct routine soil and plant amendment sampling and inspections; respond to consumer complaints; and enforce the laws and regulations that govern the manufacturing and distribution of soil and plant amendments.

A Soil Amendment is any substance which is intended to change the chemical or physical characteristics of soil. A Plant Amendment is any substance applied to plants or seeds which are intended to improve germination, growth, yield, product quality, reproduction, flavor or other desirable characteristics of plants.

Soil and plant amendments are registered for sale and distribution. Product labels are reviewed for compliance with current labeling requirements and misleading claims.

Soil and plant amendment materials are regulated through the product registration to ensure consumer safety and efficacy. Samples are collected and reviewed to ensure products are currently registered, meet labeling requirements and are not adulterated.



Soil/Plant Amendment product registration has continued to trend upwards with 2015 showing a total of **1,757** products.



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## DIVISION OF HEALTH AND SAFETY

The Division of Health and Safety has responsibility in four major program areas within the Bureau, **Pesticide Programs, Integrated Pest Management Programs, Farm Safety and Botany**. These regulatory programs are administered by the bureau's regional field staff of fifteen Agronomic Products Inspectors, fifteen Plant Inspectors, two Field Technicians and six Regional Supervisors under the direction of the Division Chief, five Pesticide Specialists, Botany Specialist and three administrative support personnel. Additionally, the Division maintains several contracts and grants with the Pennsylvania State University and United States Geological Survey to support the Pesticide and Integrated Pesticide Programs.

### Laws and Regulations Enforced by the Division

#### State Laws

- Pesticide Control Act of 1973, Act of March 1, 1974, P.L.90, No. 24, 3 P.S. 111.21-111.61 (1987)
- Act 35 of 2002, April 18, 2002 amended The act of March 10, 1949 (P.L.30, No.14), known as the Public School Code of 1949, Section 772.1 Integrated Pest Management Programs.
- Act 36 of 2002, April 18, 2002 amended The act of March 10, 1949 (P.L.30, No.14), known as the Public School Code of 1949, Section 772.1 Integrated Pest Management Programs.
- Farm Safety and Occupational Health Act Title 3 P.S. Chapter 24
- Noxious Weed Control Law, Title 3 P.S. Chapter 5A

#### Regulations

- Pesticide Rules & Regulations Title 7 Part V., 7Pa. Code Chapter 128 Rev 12,11,2010
- Pesticide Disposal Program CHEMSWEEP Pesticide Disposal Program Title 7 Part V Ch. 128b

#### Federal Laws & Regulations

- Federal Insecticide Fungicide and Rodenticide Act (FIFRA)
- Food Quality Protection Act (FQPA)
- Endangered Species Act (ESA)
- Worker Protection Standard (WPS) CFR 159

### Pesticide Program

The majority of the Division of Health and Safety's work is in the pesticide program. Pesticide means "any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant."

The division is responsible for all aspects of pesticide control. This includes regulation of manufacturing, sales, distribution, storage, use and disposal of pesticides within the

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commonwealth. Funding for the program is derived from pesticide product registration fees, certification and licensing fees, penalties and federal contracts and grant funding opportunities.

The program receives advice from the Pesticide Advisory Board, established by the Pesticide Control Act. The Board is comprised of 17 members appointed by the governor representing manufacturers, applicators, environmental, health, other agencies and academic interests.

### **Pesticide Product Registration:**

The sale and use of pesticide products in the Commonwealth of Pennsylvania must comply with both state and federal law. All pesticide uses in the United States are subject to regulation under the Federal Insecticide Fungicide Rodenticide Act (FIFRA).

All pesticide uses must be either be federally registered pursuant to FIFRA, or permitted under an "emergency exemption" as provided for in Section 18 of FIFRA. The United States Environmental Protection Agency (EPA) reviews and accepts, or denies, federal registration of pesticide uses. The state may petition the EPA to allow certain emergency uses due to circumstances which are considered to be urgent and non-routine. The state may allow the registration of additional uses of federally registered pesticides to address state specific "special local needs" under Section 24(c) of FIFRA.

The EPA allows some pesticide products, which meet very specific criteria, to be sold and used without federal registration as "reduced risk pesticides." However, the Pennsylvania Pesticide Control Act does not provide an exemption for "minimum risk pesticides" and therefore "minimum risk pesticides" must be registered in Pennsylvania for sale or use. The pesticide registration section is responsible for ensuring that all pesticide products sold and/or used in the Commonwealth are compliant with both FIFRA and the Pennsylvania Pesticide Control Act.

The division registers an average of **14,000 pesticide products** for sale in Pennsylvania each year at \$250 each, generating \$3.5 million annually for program support.

### **Pesticide Sales:**

Pesticides are classified by EPA into two categories: General use or unclassified pesticides that are typically sold over the counter to the general public, and Restricted Use Pesticides (RUP) that have been determined to pose a greater risk to the public, applicator or the environment. State law requires businesses that sell RUPs to be licensed by the department.

Each location that sells RUPs is also required to have an employee that has proved competence to the commonwealth by passing a proctored Pesticide Dealer Manager Certification examination. Dealerships pay an annual license fee of \$10 and \$15/ dealer manager. There are on average **360 pesticide dealerships** and **500 pesticide dealer managers** across the state. These locations are inspected on a regular basis to ensure compliance with regulations that cover sales and storage of pesticide products.

### **Pesticide Applicator:**

Individuals that make pesticide applications are regulated by the division based on the types of pesticides they apply, if application is done for hire, or by sensitivity of the location the

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pesticide is applied to. Individuals fall into four categories of applicators, Private, Commercial, Public, Registered technicians and non-certified or registered individuals. Where testing is required for certification, the bureau schedules more than **400 examination** times in nearly **100 locations** across the commonwealth to meet the needs of the regulated public.

### **Private Pesticide Applicator:**

Applicators who intend to purchase and/or apply restricted use pesticides for the purpose of producing an agricultural commodity on land that is owned or rented by that person or their employer. To become a certified private applicator the individual is required to demonstrate competency by passing a proctored written examination (testing is free). This class of applicators must attend continuing education training (six core and six category credits) to maintain their certification and keep records for all RUP applications. A tri-annual fee of \$10 is also required.

Additional testing is required if the applicator intends to use a restricted use fumigant. The applicator must obtain a special permit by passing a written examination specifically related to the type of fumigation which will be made.

### **Commercial/Public Pesticide Applicators (Certified):**

Individuals that apply a RUP for any use other than to raise an agronomic crop or apply or supervise any pesticide regardless of classification to the property of another either for hire or not-for-profit (other than their employer's property) or for any of the following reasons are required to be certified.

- **Fumigation**—includes a person who uses fumigants except a person who meets the definition of a private applicator.
- **Golf courses**—Includes a person who uses pesticides in the establishment and maintenance of a golf course.
- **Public and private parks**—Includes a person who uses a pesticide in a recreational or campground area of a public or private park.
- **Educational and research institutions**—Includes a person employed by a public or private educational and research facility that uses pesticides in its educational or research programs.
- **Playgrounds and athletic fields**—Includes a person who applies a pesticide to a public playground or an athletic field.
- **Apartment dwellings**—Includes an owner of an apartment building or an employee of an owner who applies a pesticide other than a disinfectant to an apartment structure of four or more units. Commercial certification is not required if the owner or employee resides in the apartment structure and applies general use pesticides to the unit in which he resides.
- **Schools**—Includes a person who uses a pesticide on school property, except for the use of disinfectants and sanitizers within the school building.
- **Swimming pools**—Includes a person who uses a pesticide in the care and maintenance of swimming pools or water recreation facilities associated with a public or private park, excluding lakes, ponds, rivers or streams.
  - The following are exceptions:
    - Disinfectants and sanitizers not used for water treatment.

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- The use of general use pesticides in the care and maintenance of a swimming pool at a private single-family residence.
- The use of a general use pesticide by an owner or employee in the care or maintenance of a swimming pool used solely as a therapeutic swimming pool.

The only difference between a commercial and public certified pesticide applicator is the cost of maintaining the certification. To be eligible for certification, a person must pass two written examinations (core and a minimum of one category) and be employed by a pesticide application business. Once exams have been successfully passed, that person has 12 months to apply for certification with the Pennsylvania Department of Agriculture. Currently there are 26 categories of commercial and public applicators. Applicators are only permitted to make pesticide applications covered by categories they hold.

### Categories of Commercial and Public Applicators:

A commercial or public applicator applying or supervising the application of a pesticide shall be certified in one or more of the following applicator categories:

- (1) **Agronomic crops**—The use of a pesticide in the production of an agricultural crop, including tobacco, grain, soybeans and forages and the application of a pesticide to non-crop agricultural land.
- (2) **Fruits and nuts**—The use of a pesticide in the production of tree fruits, nuts and berries.
- (3) **Vegetable crops**—The use of a pesticide in the production of vegetables, including, tomatoes, cabbage and celery.
- (4) **Agricultural animals**—The use of a pesticide on animals, including beef cattle, dairy cattle, swine, sheep, horses, goats, poultry or other livestock and to premises where these animals are confined.
- (5) **Forest pest control**—The use of a pesticide in a forest, forest nursery or forest seed producing area.
- (6) **Ornamental and shade trees**—The use of a pesticide in the maintenance of an ornamental tree, shrub, flower or other ornamental.
- (7) **Lawn and turf**—The use of a pesticide in the maintenance or production of lawn and turf.
- (8) **Seed treatment**—The use of a pesticide on seed.
- (9) **Aquatic pest control**—The use of a pesticide on standing or running water. (Excluding the use of a pesticide in a public health-related activity described in Category 16, sub category test for cooling towers is available.)
- (10) **Right-of-way and weeds**—The use of a pesticide to maintain a public road, an electrical power line, a pipeline, a railway right-of-way, or a similar type of area or to control vegetation around a structure, such as an oil tank, utility sub stations, an industrial railway siding, an airport, a parking lot, a fence, or an industrial building, or for the control of an invasive weed species in other areas.
- (11) **Household and health related**—The use of a pesticide in, on, or around a food handling establishment, a human or nonagricultural animal dwelling, an institution such as a school or hospital, an industrial establishment, a warehouse, a grain elevator and other types of structures whether public or private. The application of a pesticide to protect a stored, processed, or manufactured product is also included. The use of a rodenticide or avicide is

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permitted in this category. The use of a pesticide in outdoor perimeter treatments to control pests that may infest the structure is included.

- (12) **Wood destroying pests**—The use of a pesticide to control or prevent termites, powder post beetles, or other wood destroying pests infesting a residence, school, hospital, store, warehouse, or other structures or structural components, including wooden objects contained in or associated with the structure, and the area adjacent to those structures.
- (13) **Structural fumigation**—The use of a fumigant in or to a structure for the control of pests affecting the structure or its fixtures or inhabitants.
- (15) **Public health vertebrate pest control**—The use of a pesticide to manage and control a vertebrate pest such as rodents or birds, affecting public health.
- (16) **Public health invertebrate pest control**—The use of a pesticide to manage and control an invertebrate pest affecting public health.
- (17) **Regulatory pest control**—The use of a pesticide to control an organism designated by the Commonwealth or the Federal government to be a pest requiring regulatory restrictions or control procedures to protect man or the environment.
- (18) **Demonstration and research pest control**—The use of a pesticide to demonstrate to the public the proper method of application for a pesticide and the use of a pesticide in research such as that undertaken by an extension specialist, county agent or vocational agriculture teacher.
- (19) **Wood preservation**—The use of a pesticide in wood impregnation to control or prevent fungi, insects, bacteria, marine borers, and other wood destroying pests, and includes pole treating or restoration and the use of a fumigant for in-place treatment of utility poles.
- (20) **Commodity and space fumigation**—The use of a fumigant in or to a structure, trailer, railcar, onboard ship, or in any type of fumigation chamber, such as under a tarpaulin for the control of pests in stored or in-transit commodities.
- (21) **Soil fumigation**—The application of a fumigant to a soil environment.
- (22) **Interior plantscape**—The use of a pesticide to control plant pests when the soil or plant to be treated is located within an enclosed structure.
- (23) **Park or school pest control**—The use of a pesticide in a campground or recreational area of a public or private park or on school property.
- (24) **Swimming pools**—The use of a pesticide in the care and maintenance of swimming pools.
- (25) **Aerial applicator**—The use of a pesticide applied by aircraft to any crop or land area. Applicators in this category shall comply with § 128.85 (relating to ornamental or turf application) when making ornamental or turf applications.
- (26) **Sewer root control**—The use of a pesticide to control vegetative growth in public and private sewage collection and distribution lines.

These categories were designed to allow for the diversity of the nature, methods, and equipment required to treat the wide variety of situations encountered by applicators.

To maintain certification, applicators must attend update training programs in core and appropriate category-specific topics. Six core credits and up to ten category credits for each category in which the applicator is certified are required. If the recertification credit requirements are not met by the specified date, the applicator's license will expire and that

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applicator will no longer be permitted to make pesticide applications until the license is reinstated. The fees associated with commercial & public certifications are:

- Commercial Applicator Fee – \$40, annually
- Public Applicator Fee – \$10, (Every 3 years)
- Core Test Fee – \$50
- Category Test – \$10 each

### **Pesticide Examinations:**

Pesticide certification testing is administered through the seven PDA Regional Offices. Dates and times of the examinations are available on our website at [www.PaPlants.state.pa.us](http://www.PaPlants.state.pa.us) under Pesticide Programs-Certification Exam Locations. Examinations are scheduled both at the offices and remote locations with daytime and evening opportunities available. The bureau processed nearly **8,000 examinations** in 2015 that were given More than **400 occasions** at over **90 locations** across the state.

### **Registered Pesticide Technician:**

The Registered Technician Program is in place to accommodate new hires, persons with limited English proficiency, persons having trouble passing certification examinations, company policies, or as a bridge to obtaining full certification.

For an employee to become Registered Technician the business must submit the person's name and birth date to the Department which starts a minimum 30-day supervised training period. Training must be conducted by a Certified Applicator with at least 1 year of experience and knowledge in the areas of application to be requested for registration. The trainer must work for the business location that will employ the technician. At the end of the training period the pesticide business must certify they have completed the required elements of the training, submit the appropriate fee, and maintain proof of the training. Applications made by technicians are limited to the use of materials, methods, and equipment on which they have documented training. Technicians must also be under the supervision of a certified applicator that can be on site within 5 hours if necessary. Technicians are not transferable between businesses. The annual renewal must include verification of continuing training by a certified applicator in the prior year.

The fees associated with registered technicians are:

- Commercial Registered Technician Fee – \$30, annually
- Public Registered Technician Fee – \$20, annually

### **Non-Certified, Non Registered Pesticide Applicators:**

This class includes anyone who would apply a pesticide who does not hold a valid pesticide certification or registered technician status. These applicators can only make pesticide applications in situations when certification is required if a certified applicator is physically present and in both voice and visual control of the application. These applications may be made as part of the on-the-job training program for earning technician status or for any other reason.

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## General Public Use of Pesticides:

Both state and federal laws regulate all applications of pesticides. The pesticide label is given status as an extension of the law requiring that all instructions on the label be followed and that deviations are considered violations of the Acts. This gives the commonwealth the responsibility to regulate all pesticide applications even when they are made by a person on their own property when certification is not required.

## Applicator Training:

To enable applicators to meet the required recertification training requirements the pesticide program supports the development of study materials and ongoing recertification training provided by the Pennsylvania State University Pesticide Education Program (PEP). PDA, through a continuation of multiyear grants and contracts uses the PEP to provide a systematic updating of the certification examinations and preparatory study materials. This collaboration is also enables the PEP through the Penn State Extension to provide continuing training to the applicator public. These efforts are responsible for offering more than **1,000 training opportunities** each year. Private industry also offers educational opportunities in addition to those given by extension and PEP staff. PDA Inspectors are also involved by giving presentations and monitoring classes for appropriate content.

## Enforcement



PDA maintains a regulatory presence by responding to complaints or tips and conducting routine inspections. The 14 Agronomic Product Inspectors and 6 regional supervisors have completed extensive training with annual refresher courses and carry US EPA inspector credentials. These federal credentials are used for investigations and inspections handled at the request of US EPA. However, the majority of enforcement activities are handled under state authority.

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Enforcement activities range from inspections of pesticides received at international ports of entry, producer establishments, marketplace inspections, pesticide use inspections, responding to consumer complaints, environmental contamination, drift issues, pesticide residue on food, lawn care, interior pesticide applications, license requirement enforcement, and neighborhood disputes. Field staff is supported by PDA headquarters staff and its analytical laboratory. The Division responds to approximately **150 complaints** each year and conducts more than **500 regulatory** inspections. The most frequent violations are unlicensed businesses and applicators, followed by failure to properly pre-notify hypersensitive individuals and recordkeeping.

### Protection from Pesticide Exposure

Special protections are in place to protect children, workers, and those with abnormal sensitivity to pesticide exposure. PDA enforces regulations designed to protect children for exposures at schools, daycare facilities, parks, and playgrounds. Agricultural employers are inspected by PDA to ensure that workers covered under the federal Worker Protection Standard are trained and provided the information and proper protective equipment. The division also supports the annual Migrant Health Care Conference to keep the health care community informed of the potential and recognition of symptomology for work-related pesticide exposures. PDA also contracts with the PA Office of Rural Health to provide outreach with WPS training and support to the regulated community and migrant clinic network. PDA maintains and distributes a list of persons who have provided the department with medical verification of an abnormal sensitivity to pesticides. This information is then published and distributed to all licensed businesses two times per year so individuals on this registry can be notified of pending pesticide applications and take precautions to protect themselves.

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## Plastic Pesticide Container Recycling Program (PPCR)

As part of the environmental mission, PDA operates a recycling program to collect, chip and sell empty plastic pesticide containers. Started in 1993 this program has recycled more than **2.2 million pounds** of plastic. Funded by pesticide product registration fees, this program is part of the overall pesticide environment stewardship program. PDA maintains a network of more than **160 industry locations** to inspect and collect empty pesticide containers. PDA then granulates the plastic and sells it to dedicated recyclers for use in industrial products such as fence posts, pallets, speed bumps, marine pilings, and field drain tiles.



This program is available to all licensed pesticide applicators. In order to participate in the program, applicators must ensure that all containers are free of all products, inside and outside. Triple rinsing is required. All label booklets, plastic sleeves and caps should be removed and discarded. Only #2 HDPE plastic containers from EPA registered agricultural, structural, turf, forestry, and specialty pest control products, as well as containers from crop oils, surfactants, and fertilizers, will be accepted.

Plastic pesticide container recycling benefits PA pesticide applicators in many ways:

- Rinsing all the pesticide into their spray tank, applicators get maximum product for their money;
- Recycled containers reduce unsightly clutter and provide for needed landfill space;
- Recycled containers do not contaminate the air or groundwater by being burned or buried.

## CHEMSWEEP Waste Pesticide Disposal Program

Each year, pesticide products are cancelled by the manufacturer or phased out by operations, leaving growers and applicators with quantities of unwanted and/or unusable pesticides. Due to the nature of these materials, there are often limited options available for responsible management. The high cost of disposal prohibits many users from hiring professionals to dispose of these materials. The waste pesticides may then become a safety hazard or environmental liability through long-term storage in barns and other areas in and around the farm or business.



The PDA CHEMSWEEP program provides Pennsylvania farmers and other licensed applicators with an environmentally responsible means to dispose of canceled, suspended, or unwanted pesticide products. By participating in this program, applicators can legally dispose of waste pesticides, generally at little or no cost. Almost all of the waste pesticides collected

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are burned in EPA-approved incinerators. The remaining pesticides are treated and placed in EPA-permitted hazardous waste landfills.

CHEMSWEEP has grown from the collection of a modest 30,000 pounds of pesticides from six counties in 1993, to a program that serves all of Pennsylvania, having collected more than **2.3 million pounds** of waste pesticides through 2015. Funding for this program is derived from the pesticide product registration fees paid by the manufactures of these products as part of their environmental stewardship responsibility.



Following a standard four-year rotation, CHEMSWEEP is offered in every county. Farmers, pesticide applicators and pesticide businesses in the counties selected for that year are eligible to participate. Applicators and businesses are mailed inventory forms to complete and return to the department by the February 28 deadline.

Collections usually take place during the warm weather months. CHEMSWEEP will cover the cost of the first 2,000 pounds per participant. Participants with waste pesticides exceeding 2,000 pounds will be responsible for the cost of the excess amount and will be direct-invoiced by the PDA contractor at the contracted price at time of service. Any pesticide product that is or has been registered for sale or use in the Commonwealth will be accepted in this program.

All registration forms will be verified by PDA prior to collection of the waste pesticides. These materials are classified as Universal Waste Pesticides and will be collected, packaged, transported and disposed of in accordance with all applicable rules and regulations. The PDA contractor assumes generator-of-record status of the waste pesticides at the time of collection.

Homeowners can benefit from Chemsweep as well. PDA partners with DEP and local counties & municipalities to fund Household Hazardous Waste (HHW) collection events.

### Integrated Pest Management

The PDA Integrated Pest Management (IPM) program section promotes the use of IPM by Pennsylvania growers, agribusiness, schools and other pesticide users through outreach, demonstrations, and research projects. PDA:

- Provides literature on the benefits of IPM to growers and the public,
- Supports IPM through referrals to pest identification resources and other services,
- Encourages the voluntary adoption of IPM in Pennsylvania's public and private schools by providing training and materials,
- Works concurrently with Penn State University IPM program to support the adoption and use of IPM, and

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- Has won several federal grants securing funding for education, demonstration, and research to promote and establish the use of IPM in agronomic production. Also,
- Pennsylvania is a signatory party to the Chesapeake Bay resolution, which encourages the promotion of Integrated Pest Management (IPM) practices to citizens as a method to reduce contaminants in the Bay.

The Division has one specialist and one PSU contract employee working full time on IPM projects. The three focus areas are Enabling schools to have successful IPM programs to reduce pesticide exposure to children, working with the state's conifer growers to use IPM scouting and weather data for insect/disease forecasting as a way to time biocontrol releases, make pesticide applications, and promoting usage of biocontrol in sweet corn and vegetable production for the growing market using high tunnel production methods. Many of these efforts include working with the Anabaptist growers that are adopting high tunnels as a means of increasing the marketability of their crops.

### **Farm Safety Program**

On average 24 Pennsylvanians lose their lives in farming related accidents each year. PDA works with the Penn State University to promote safe farming practices in the commonwealth. State funding was used to develop training modules that are being used to train first responders to farm accidents and emergencies. With the development of the training modules completed, they are taught to several hundred responders each year on a fee-for-service arrangement. There are many unique situations and hazards associated with production agriculture. This training has enabled first responders to recognize these hidden dangers and handle rescues in ways to avoid further complications to the victims and injuries to themselves.

PDA partners with PSU, the agricultural industry, insurance industry, FFA, and 4-H to promote farm safety to youth through the Farm Safety Quiz Bowl competition. FFA and 4-H teams from across the state compete at Ag Progress Days and the PA Farm Show showing their knowledge of a wide range of safe farming practices and hazard recognition. Prize money given by industry supports these efforts to reach the youth. Pesticide safety is a top priority in the pesticide program with safety training as a mandatory part of the recertification process.

The Farm Safety and Occupational Health Board meet annually during the PA Farm Show to review the year's activities and look for opportunities to promote safe farming practices.

### **Botany Noxious Weed Program**

The Bureau administers the Noxious Weed Control Law and Noxious Weed Control List and implements federal and state eradication and control programs when a noxious weed of limited distribution in the commonwealth is targeted by federal or state funding for suppression, control or eradication.

Poisonous plant identification and information and the Poisonous Plants of Pennsylvania Publications are available from the Bureau. The State Herbarium, pressed plant collection, is located at the Department's main office in Harrisburg.

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There are 13 Pennsylvania Noxious Weeds on the Control List for Pennsylvania (listed by their common names and also the scientific names):

- **Bull Thistle** or Spear Thistle - *Cirsium vulgare*
- **Canada Thistle** - *Cirsium arvense*
- **Giant Hogweed** - *Heracleum mantegazzianum* (Active Field Program)
- **Goatsrue** - *Galega officinalis* (Active Field Program)
- **Jimsonweed** - *Datura stramonium*
- **Johnson Grass** - *Sorghum halepense*
- **Kudzu** - *Pueraria lobata* (Active Field Program)
- **Marijuana** - *Cannabis sativa*
- **Mile-a-Minute** - *Polygonum perfoliatum*
- **Multiflora Rose** - *Rosa multiflora*
- **Musk Thistle** or Nodding Thistle - *Carduus nutans*
- **Purple Loosestrife** - *Lythrum salicaria*
- **Shattercane** - *Sorghum bicolor*

Currently, the Bureau is actively engaged in projects (some with USDA grant funding) to control or eradicate five invasive weeds in the commonwealth:

- **Giant Hogweed** – this very toxic plant was originally identified in over 500 locations throughout the state. Eradication efforts have reduced the number of active sites to less than 90 in the commonwealth.
- **Goatsrue** – This fast spreading weed has been identified in 130 locations, treatments are attempting to limit spread to new areas. PDA is working with other agencies and organizations to control this Federal Noxious weed.
- **Kudzu** – This aggressive vine has been identified in 63 locations. Treatments show promise in control on smaller accessible stands.
- **Mile-a-minute** – Although widely spread in the southern portions of the state, mile-a-minute populations are limited in the northern part of the commonwealth. Chemical control is still the main control method, although biological and mechanical control management of Mile-a-minute are increasingly being used for control. Over the past several years thousands of weevils, *Rhinoncomimus latipes*, have been released to

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control Mile-a-minute populations in several counties across the state with positive results.

- **Hydrilla** – An aggressive, aquatic weed which has been confirmed in 13 waterbodies in the commonwealth. PDA and other state agencies and outside organizations, have formed a working committee to address monitoring, outreach and treatment of this very invasive plant. Hydrilla is a Federal Noxious Weed.

The Botany program assists local municipalities in seeking landowner compliance with the control of noxious weeds growing on those properties. The PDA is also a resource for identification of new weed threats to agriculture. The fall of 2013 was the first identification of an herbicide resistant pigweed – Palmer amaranth (*Amaranthus palmeri*), in Pennsylvania fields. First found in Chester County, it has since been identified in 31 additional locations throughout the state. This aggressive weed will be part of continuing efforts in education and weed management planning as part of a joint response program with Penn State and the PDA.

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## PLANT HEALTH DIVISION

The Plant Health Division houses plant inspection programs and plant disease survey and laboratory functions. Division programs protect the health of plants in the neighborhoods, fields, and forests of the Commonwealth. It provides consumer protection for farmers and homeowners purchasing plants by ensuring the plants that they buy are healthy, and it helps to provide a level playing field for businesses wanting to sell plants interstate or internationally. The plant merchant licensing and plant inspection program is responsible for phytosanitary inspection and certification. The Plant Disease Diagnostic Laboratory provides disease diagnostic support to survey, plant inspection, and certification programs. The Fruit Tree Improvement Program (FTIP) and Cooperative Agriculture Pest Survey (CAPS) coordination are run through this division.

### Plant Merchant Licensing and Inspection

#### ***2015 By The Numbers: Plant Merchant Licensing***

- 8,100 business licensed as nurseries or nursery dealers
- 567 federal phytosanitary certificates issued
- 65 active compliance agreements with various businesses

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**Nursery/Nursery Dealer Certification:** Regional plant inspectors continued to contact businesses that need to be licensed under requirements of the PA Plant Pest Act, inspect registered business, and provide inspections for federal and state phytosanitary certificates. More than 8,100 businesses were licensed as Plant Merchants in Pennsylvania in 2015. This number includes nursery operations, greenhouse operations, plant dealers, brokers, and landscapers.

**Phytosanitary Certification:** In 2015, 567 federal phytosanitary certificates were issued to ship plants internationally. 510 state phytosanitary certificates were issued to ship plants within the United States.

**Nursery/Nursery Dealer Inspections:** A total of 3,886 inspections of nurseries, nursery dealers and greenhouses were performed for calendar year 2015. Inspections are conducted to protect Pennsylvania horticulture from harmful plant pests, and as surveillance of the nursery industry that serves as a pathway for potential new exotic pest introductions that could prove harmful to Pennsylvania's green industries. 274 "Stop Sales" were issued as a result of identification of pests of concern by the plant inspectors. A total of 988 samples were processed by the entomology, pathology, botany, nematology, and virology labs to support the Plant Health Program and Plant Inspectors.



**Boxwood Blight, *Calonectria pseudonaviculatum* Trace-Forward investigations in PA:** PDA inspectors visited more than 150 sites that received shipments from out-of-state nurseries supplying *Buxus sp.* in 2015. The trace-forward locations included small retail garden centers, landscapers and two major home improvement big box stores. A total of 167 samples were collected and submitted to the Plant Disease Diagnostic Laboratory. 70 samples were positive for Boxwood Blight. The box stores represented 121 samples with 55 positives received from out of state shippers. These numbers increased significantly from 2014 with 62 samples submitted and 9 positives detected. All infected material was destroyed.

### Fruit Tree Improvement Program

#### ***2015 By The Numbers: Fruit Tree Improvement Program***

FTIP opens markets, reduces production losses due to viruses, and improves quality of trees produced by participating nurseries. In 2015:

- First new applicant to enter the FTIP program in over 30 years!
- Over 2,000 samples tested for viruses of concern
- All 3 participating nurseries met requirements of the FTIP

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The Pennsylvania Fruit Tree Improvement Program (FTIP) provides specialized virus inspection and testing services for participating Pennsylvania fruit tree nurseries. An important partnership has developed between the nurseries and the PDA through the FTIP. The FTIP allows the nurseries to produce and make widely available nursery trees that have been tested for the most economically damaging viruses that affect apple, pear, quince and stone fruit. The PDA benefits from its strong relationship with the facilities by having a consistent presence in these large production nurseries, allowing for the monitoring of common viruses as well as newly introduced disease.



All stone fruit nursery material was tested for *Prunus* necrotic ringspot (PNRSV), prune dwarf virus (PDV), tomato ringspot virus (ToRSV), and plum pox virus (PPV). A total of 2,196 *Prunus* samples were processed through the FTIP laboratory in 2015, including samples from registered and common-stock budwood production blocks, a registered seed block, and certified nursery rootstock blocks. To monitor for tomato ringspot virus, broadleaf weed samples were collected and tested. No soil samples were collected this year.

Registered blocks and nursery production blocks were found in thrifty growing condition, with no obvious signs of virus infection. All blocks met virus-testing requirements for FTIP certification. No PDV or ToRSV was detected in rootstock blocks or in registered source blocks. PNRSV remains the most commonly found viruses in *Prunus* in Pennsylvania, although finds in registered blocks and nursery production blocks are rare. All samples tested negative for plum pox virus, a virus declared eradicated from Pennsylvania in 2009.

## Disease Diagnostic Laboratory Results

### **2015 By The Numbers: Plant Diagnostic Laboratory Samples**

- 974 samples processed
- Pathogens identified on 566 samples

**Pathogens detected in samples submitted to PDA:** In 2015 the Plant Diagnostic Laboratory processed a total of 974 samples, as recorded in the PaPlants database. PDA Plant Inspectors, Penn State Extension, growers, and IPM specialists submitted plant materials to satisfy their inspection, certification, survey, plant propagation, extension, and regulatory programs. Among the 970 samples received, there were 622 pathogens identified as a causal agent on 566 of the samples (some samples with multiple pathogens): Bacteria (78), Fungus (468), Nematode (4), Virus (72). In 2015, the occurrence of bacterial diseases peaked during the months of April-July; Fungus April-October; and Virus June-July (see Table1).

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**Table 1. Monthly distribution of pathogen groups, 2015**

Month	Bacteria	Fungus	Nematode	Virus	Total, N
Jan	6	7		1	14
Feb	1	7	2	9	19
Mar	4	14		2	20
Apr	17	35		6	58
May	10	33		6	49
Jun	12	48	1	14	74
Jul	13	108		27	148
Aug	5	43	1		49
Sep	5	76		6	87
Oct	1	51			52
Nov	2	30		1	33
Dec	2	16			18
Total, N	78	468	4	72	622

Table 2. Most commonly identified diseases in 2015

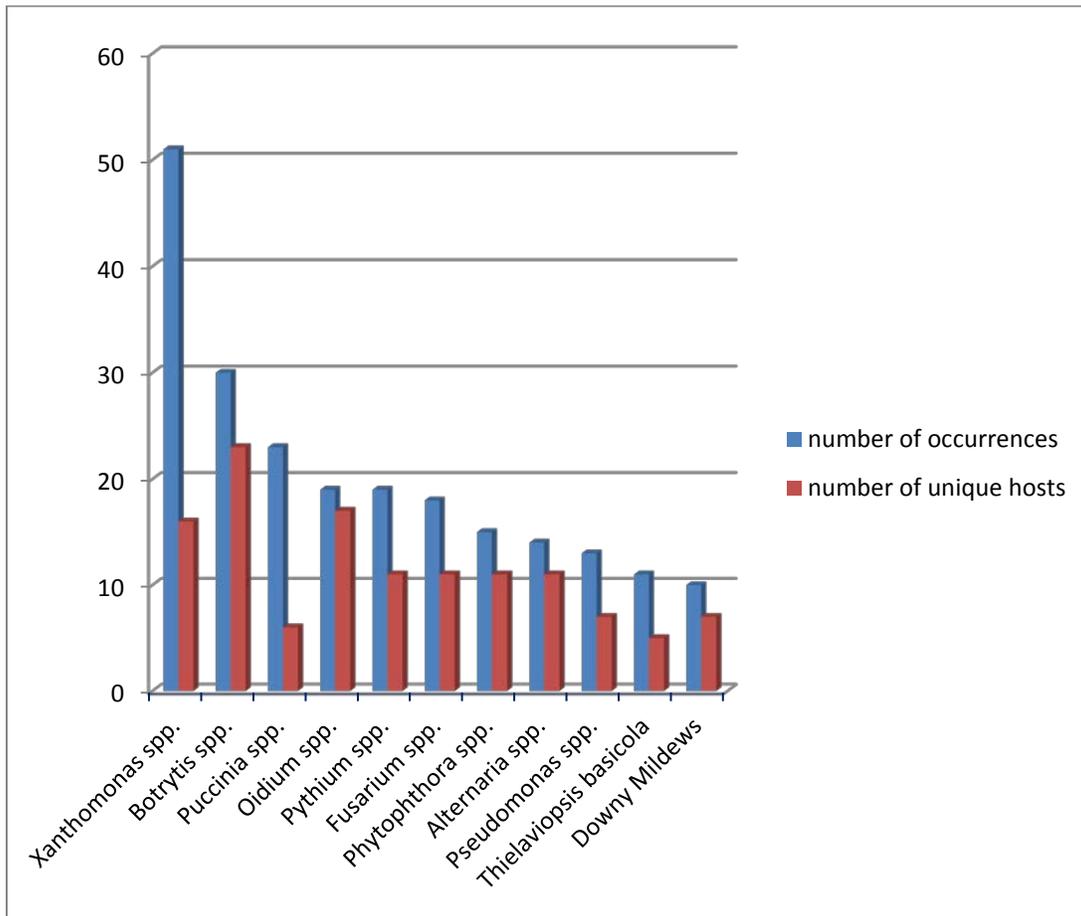
	Host Scientific Name	Pest Scientific Name	# Samples
BACTERIA	Capsicum annuum	Xanthomonas euvesicatoria	15
	Solanum lycopersicum	Pseudomonas syringae. pv. tomato	7
	Solanum lycopersicum	Xanthomonas spp.	6
	Begonia spp.	Xanthomonas axonopodis pv. begoniae	5
	Malus sylvestris	Erwinia amylovora	4
	Ficus benjamina	Xanthomonas campestris pv. fici	3
	Zinnia spp. and hybrids	Xanthomonas campestris pv. zinneae	3
FUNGUS	Buxus spp.	Volutella buxi	57
	Buxus spp.	Calonectria pseudonaviculatum	65
	Picea spp.	Stigmina lautii	28
	Chrysanthemum spp.	Puccinia horiana (Prev. erad.)	13
	Picea spp.	Chrysomyxa weirii	12
VIRUS	Solanum tuberosum	Potato virus Y (Potyvirus)	16
	Solanum tuberosum	Potato virus Y - Necrotic strain (Potyvirus)	7
	Coleus spp.	Impatiens necrotic spot virus (Tospovirus)	5
	Begonia spp.	Impatiens necrotic spot virus (Tospovirus)	3

Table 3. Distribution of crop groups for submitted samples; Total samples=974.

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Crop Type	# Samples	Crop Type	# Samples
Annual	185	Indoor House Plant	42
Conifer	127	Ornamental Grass	1
Deciduous Tree	63	Perennial	90
Fern	1	Small Fruit	10
Fruit Tree	22	Vegetable	131
Ground Cover	12	Woody Shrub	260
Herb	17	Other	13

Figure: Most common groups of bacteria and fungi (>10) identified on greatest number of different plant species (>7).



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## Some disease image highlights of 2015:

*Xanthomonas euvesicatoria* on pepper



*Xanthomonas axonopodis* pv. *begoniae* on begonia



*Xanthomonas hortorum* on Lavender



*Xanthomonas campestris* pv. *fici* on Ficus



*Calonectria pseudonaviculatum* on boxwood



*Chrysomyxa weirii* on blue spruce



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**Thousand cankers disease (TCD) fungal component, *Geosmithia morbida*.** The first detection of TCD in PA occurred in Bucks County in 2011. Since that time, trapping of the vector, *Pityophthorus juglandis*, has taken precedence in TCD detection. Because of the additional time required to isolate *G. morbida*, PA amended TCD quarantine language to allow quarantine action based on presence of *Pityophthorus juglandis* alone. The PDA plant pathology lab confirms presence of *Geosmithia morbida* when possible, particularly when new positive counties are identified through trapping. In 2015, there was no expansion of the TCD quarantine area in Pennsylvania. Although small numbers of *P. juglandis* were trapped in current quarantine areas, we did not look for infested trees or *G. morbida*.

***Chrysanthemum white rust caused by Puccinia horiana.***

This disease occurred for the first time in PA in 1978. PDA eradicated the infested site and remained rust-free for 26 years, until 2004. *P. horiana* continues to appear as a chronic disease since the introduction of the rust to PA in 2004. It remains in limited distribution, however, most likely because of market and regulatory pressure coupled with excellent fungicides available to control the disease.



### Survey Activities

#### **Cooperative Agricultural Pest Survey**



Pennsylvania Department of Agriculture leads the Cooperative Agriculture Pest Survey (CAPS) in PA with support from Pennsylvania Department of Conservation and Natural Resources, The Pennsylvania State University, Penn State Extension, DHS-Customs and Border Protection and USDA-APHIS-Plant Protection and Quarantine. The coordinating committee meets annually to review program needs and accomplishments and to network about pest issues of concern to the Commonwealth. The infrastructure provided through the CAPS program creates a ready resource of expertise and diagnostic ability to address new introductions of damaging insects, pathogens, nematodes and weeds.

The CAPS program funded 3 detection surveys in 2015. A summary of results follows:

- 1) **Exotic Wood Boring Beetles (EWBB):** This survey was managed and run by Entomology Division staff, who provide a detailed account of results within their own section of this report. To summarize here, the EWBB survey included 13 trapping sites plus visual survey records. The trapping locations (105 variously baited traps) were established at sites deemed high-risk for exotic pest introduction. The suite of target pests included insects affecting oak, sassafras, conifers, and other Northeastern hardwoods. Of the 29,149 specimens collected from traps, no targets of national concern were detected although several pests of concern to Pennsylvania were identified. All visual surveys were negative for target pests.

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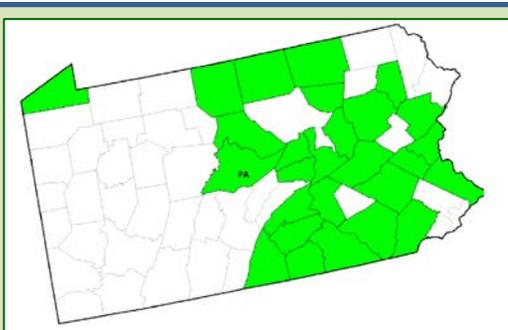
## 2) Survey for Cyst Nematodes of Regulatory Importance

### 2015 By the Numbers: CAPS nematode survey

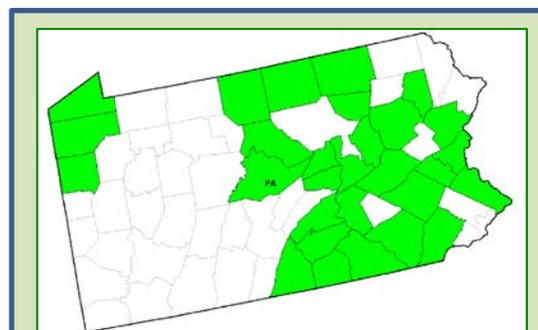
Sampled potato and tomato fields:  
27 counties, primarily in eastern PA  
95 fields  
299 samples  
All samples have tested negative for target pests

The golden nematode (GN) and the pale cyst nematode (PCN) are the primary target pests for this survey of nematodes of regulatory concern. The known distribution for GN in the U.S. is a few counties in NY. The pale cyst nematode was found for the first time in the U.S. in 2006 in Idaho and has been a named priority target ever since. Pennsylvania is concerned about the Columbia root knot nematode, *Meloidogyne chitwoodi*, which has the potential to be introduced into Pennsylvania on seed potato. The same soil that is collected for cyst analysis is also examined via bioassay for *Meloidogyne* spp. to make the best use of travel and personnel. In 2015, we included *Meloidogyne artiellia* and *Punctodera chalcoensis* to our target pest list for the second consecutive year.

With the assistance of PSU county extension educators, acreage is identified and grower permission for survey is obtained throughout spring and summer. Soil sampling is conducted either manually or with a tractor-pulled mechanical sampling wheel according to the USDA protocol in the USDA Golden Nematode Program Manual and consistent with CAPS Approved Methods. Biosecurity measures include disinfection of tools, boots, vehicles and equipment with the use of a steamwasher. Sampling is conducted after harvest, beginning in August.



NAPIS-generated map of counties sampled in 2015 for Golden nematode (*Globodera rostochiensis*), Pale Cyst nematode (*Globodera pallida*) and Mexican Corn Cyst nematode (*Punctodera chalcoensis*)



NAPIS-generated map of counties sampled in 2015 for British Root-knot Nematode (*Meloidogyne artiellia*) and Columbian Root-knot Nematode (*Meloidogyne chitwoodi*)

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Laboratory processing is conducted in Harrisburg at the PA Department of Agriculture. A portion of each sample is used for greenhouse bioassay to detect root knot nematodes. Air-dried samples are also wet-sieved. Laboratory work continues from December through May. No target nematodes have been detected.

**3) Nursery/Greenhouse Pathogen Survey:** Movement of plant material is a primary pathway for distribution of plant diseases. The third component of CAPS surveys in 2015 addressed this pathway by monitoring for five diseases in commercial nurseries and greenhouses. The disease targets for this survey were *Phytophthora ramorum*, *Phytophthora alni*, *Phytophthora quercina*, *Candidatus Phytoplasma pini*, and *Cronartium flaccidum*. These diseases are not known to be present in Pennsylvania, but cause ecological and economic damage to forests, agricultural crops, and ornamental plants where they do occur.

In the course of their plant inspection duties, regional staff documented sites where susceptible host material was present, and noted whether or not symptoms of disease were found. Samples were taken when symptoms were present, and examined and/or tested in the PDA labs for survey target pathogens in addition to receiving a general diagnostic examination.

	# target hosts surveyed	# counties	# sites	# plants inspected (est)
<i>Cronartium flaccidum</i>	1/1	15	28	61,114
<i>Candidatus Phytoplasma pini</i> 16SrXXI-A	1/1	15	28	61,114
<i>Phytophthora alni</i>	1/1	4	5	2,114
<i>Phytophthora quercina</i>	1/1	21	36	21,397
<i>Phytophthora ramorum</i>	5/5	26	59	27,302

No survey target pathogens were detected in the nursery disease survey.

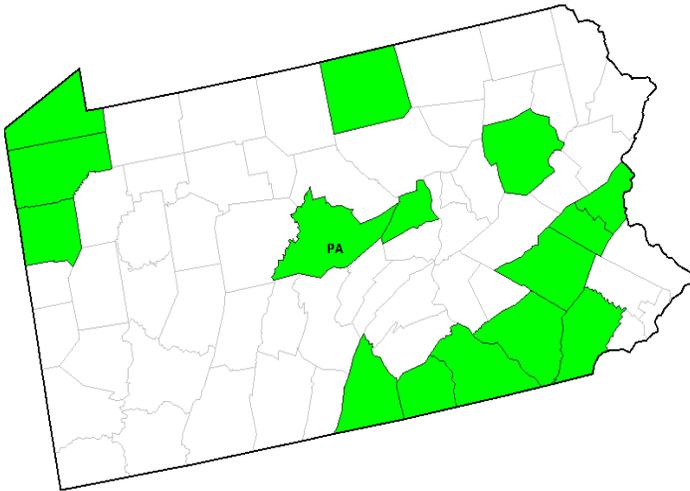
There are multiple benefits from this nursery survey. Not only do we have baseline negative data, in the event that these exotic diseases are found in future. We also have trained field personnel to look for symptoms, and we have prepared the PDA lab to perform the diagnostic testing when necessary.



PDA Nursery Disease Survey  
Field Guide

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## Other Pennsylvania surveys:



**Soybean cyst nematode (SCN):** SCN, *Heterodera glycines*, is of concern to Pennsylvania due to its impact on phytosanitary certification of nursery stock and its economic damage potential for soybean production (590,000 acres scheduled for planting in PA in 2016). SCN has been found in only one PA county, and is limited in distribution within that county. In 2015, 21 soybean fields in 15 counties were surveyed for SCN via soil sampling. A total of 45 samples were collected and tested; No SCN was detected.

**Fruit Tree Exotic Disease Survey:** A Farm Bill-funded survey of exotic pathogens in orchards was conducted for the first time in 2014 and continued in 2015. None of the target pathogens are known to occur in PA, and all are identified as national targets for survey: Plum Pox Virus, Apple brown rot (*Monilinia fructigena*), Asiatic Brown Rot (*Monilia polystroma*), European stone fruit yellows (*Candidatus Phytoplasma prunorum*) and Apple Proliferation (*Candidatus Phytoplasma mali*). A multi-county survey included visual inspection and sampling/testing for pests. The survey spanned multiple counties, but was concentrated in two counties: Adams County, the state’s top county in both stone fruit and apple production; and Berks County, where spotted lanternfly (SLF), *Lycorma delicatula*, was detected in September 2014, its first detection in the western hemisphere. The team doing the orchard exotic disease survey was cross-trained in the life stages and habits of the SLF. Because SLF was documented as causing damage to orchards in Korea, our work in orchards near the spotted lanternfly quarantine area was an additional surveillance tool for the SLF survey.

Survey Component		Total Neg	Total POS
Plum Pox Virus	Samples	5,526	0
	Blocks	45	0
	Counties	4	0
Exotic Phytoplasma	Samples	112	0*
	Blocks	59	0*
	Counties	7	0*
Exotic <i>Monilinia/Monilia</i>	Samples	19	0
	Blocks	59	0
	Counties	7	0

\* No positives for target exotic phytoplasmas; description of positive finds for non-target phytoplasmas below.

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Plum pox survey took place from May through July, while survey for phytoplasma and brown rot occurred August through October. In 2015, over 50 orchard blocks were visually inspected for exotic brown rot and exotic phytoplasmas. Dr. Kari Peter, Penn State, processed samples collected for brown rot survey; no exotic species were detected.

For phytoplasma survey, the PDA Plant Diagnostic Lab completed diagnostics of 112 samples with suspect symptoms. The samples were collected from apple, pear, peach, apricot, and plum trees. All samples tested negative for exotic Apple Proliferation Phytoplasma (*Candidatus Phytoplasma mali*) and European Stone Fruit Yellows Phytoplasma (*Candidatus Phytoplasma prunorum*). However, X-Disease Phytoplasma (*Candidatus Phytoplasma pruni*) was detected on ten peach trees in Adams and Berks counties and Apple X-Disease Phytoplasma (*Candidatus Phytoplasma pruni*) was found on one apple tree in Adams County. No regulatory action is taken when X-Disease is found in orchard settings in PA.

PA has a history of X-Disease on peaches, while the first detection of X-Disease on apples was made in 2014. A new possible pathogen / host relationship was found on a peach sample from Berks County. The sample appeared to be infected with phytoplasma showing 98% similarity with Ash Yellows Phytoplasma by sequencing (16S rDNA). This sample was sent to USDA for further study; a definite identification has not yet been made.

**Cherry Virus A Survey:** Plant Health was asked by the Clean Plant Center Northwest (CPCNW) to assist with a sampling survey aimed at producing a preliminary estimate of the incidence of Cherry Virus A (CVA) in representative samples of *Prunus* from states with major stone fruit production. Recent observations have increased the awareness of CVA and its potential to occur in commercial *Prunus* production orchards. Pennsylvania collected 150 samples from six peach blocks in 2014. Results were received in 2015. The CPCNW reported 17/150 samples positive for CVA, sprinkled across five of the six blocks sampled. Cherry Virus A is likely to have been widely distributed with “clean” plant material throughout Pennsylvania, and will require time to flush out of the nursery distribution stream. This virus is generally considered latent or asymptomatic, although there are likely to be situations where it can cause disease.

**Solanaceous Commodity Pathogen Survey in Pennsylvania:** For the first time in 2015, PDA received funding from the Farm Bill Section 10007 to conduct an exotic plant pathogen survey on solanaceous vegetable hosts such as tomato, potato and eggplant. Targeted pathogens include *Candidatus Phytoplasma australiense* (Australian grapevine yellows), *Ralstonia solanacearum* race 3 biovar 2 (Bacterial wilt), and *Synchytrium endobioticum* (Potato wart). The survey has been combining visual inspection, sampling, and lab testing for pathogens according to 2015 USDA Approved Methods. PDA Plant inspectors, PDA seasonal employees, PSU faculty and Extension specialists, PA growers, and grower consultants were educated on symptoms of target diseases. The sampling season started in May and continued through October.

PDA was approved by USDA PPQ to run molecular diagnostic screening for phytoplasma after PDA plant pathologist Dr. Nikolaeva completed phytoplasma molecular detection

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training in USDA-APHIS-PPQ, Beltsville, MD in March 2015 (travel funded by NPDN). Dr. Nikolaeva worked to modify USDA phytoplasma multiplex real-time PCR protocol with agreement from USDA PPQ (Dr. S. Costanzo and Dr. R. Davis) as she discovered that the original internal control primers failed to bind to solanaceous plant DNA. The official protocol for phytoplasma detection from solanaceous hosts is under validation by USDA PPQ right now (Dr. S. Costanzo). No target pathogens were detected in the 2015 survey.

<b>Farm Bill Solanaceous Disease Survey Targets</b>	<b>Total samples/ Positives</b>	<b>Total locations</b>	<b>Total counties</b>
Australian grapevine yellows	35/0	20	6
Bois noir/stolbur Phytoplasma and general Phytoplasma	105/0	48	18
Bacterial wilt	32/0	22	11
Potato wart	42/0	14	7

**Pennsylvania Phytophthora forest stream survey:** Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry surveyed PA forest streams for profiling *Phytophthora* species occurrences during the last six years, 2010-2015. In 2015, Tom Hall, Forest Plant Pathologist, collected 74 samples from 4 PA forest stream sites and submitted them to the PDA Laboratory. The lab isolated 162 suspect *Phytophthora*-like cultures from the samples. The cultures are deposited in the PDA culture collection and species are being identified using morphological and molecular methods. The collection could be used for future reference and research. 2015 forest stream survey failed to detect *Phytophthora ramorum* in PA streams, but about 89% of stream samples carried other species of *Phytophthora* species as well as *Pythium* and *Phytopythium* species.

### Special Projects

**Systems Approach to Nursery Certification (SANC):**

Bureau of Plant Industry staff members have played key roles in the development of the new National Plant Board SANC program, offering a robust alternative to traditional nursery certification. In 2014, a Pennsylvania plant merchant, the Conard Pyle company, agreed to be in the first wave of nursery facilities to pilot the program. In 2015 Conrad Pyle completed and the SANC Pilot Subcommittee has approved a SANC Facility Manual, the first SANC manual ever produced. The next step will be the completion of internal audits by the facility and then an external audit to be conducted by PDA. Pennsylvania continues to be actively engaged with the SANC program through committee work. SANC focuses on identifying critical control points (CCPs), best management practices (BMPs), and audit approaches to nursery pest management, with the ultimate goal of growing a better product and decreasing movement of plant pests.



<http://sanc.nationalplantboard.org/>

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**National Forest Stream survey for *Phytophthora ramorum*:** PDA’s Plant Disease Diagnostic Laboratory, Penn State, and USDA Forest Service jointly participated in the Eastern Regional Forest Stream Survey for *Phytophthora ramorum*. AL, CT, FL, GA, MD, MS, NC, NY, OH, PA, SC, TN, TX, VA, and WV have participated in the survey during the last six years, 2010-2015. In 2015, the PDA lab processed 804 samples from 48 different sites in eight states (AL, FL, GA, MS, NC, PA, SC, and TX), and the conclusions were: (1) The Rhododendron leaf bait samples from the streams of AL (AL3, 4/14/2015) and NC (NC11, 12/1/2015) were *P. ramorum* positive; (2) Both sites were previously reported *P. ramorum* positive in 2009 and 2010, respectively; (3) Both “whole leaf” and “leaf pieces” methods detected *P. ramorum* in samples from the stream AL3, however only the “leaf pieces” method detected *P. ramorum* from the stream NC11. In 2015, the PDA diagnostic lab has isolated 408 *Phytophthora*-like cultures from the forest streams of the eight Eastern Regional States and has archived them in the PDA culture collection.

Table 1. *P. ramorum* detection result summary

State	Spring			Fall			Total
	Inconclusive	Negative	Positive	Inconclusive	Negative	Positive	
AL	1	51	2		108		162
FL					28		28
GA	1	89			180		270
MS	1	29			60		90
NC		32			39	1	72
PA		40			64		104
SC		30		1	39		70
TX					8		8
<b>Total</b>	<b>3</b>	<b>271</b>	<b>2</b>	<b>1</b>	<b>526</b>	<b>1</b>	<b>804</b>

**Rapid Decline of Apples – second year:** As the 2014 growing season progressed, several orchardists reported severe decline in certain apple blocks. By the end of October, five separate apple orchards reported symptoms and four were visited and sampled by Plant Health personnel. Two blocks were located in Adams County, and one each in Berks, Bedford and York counties. Affected apple varieties were Gala, Fuji and Golden Delicious, and all declining blocks were on M9 rootstock.

The general observed symptoms included:

- a mix of dead, declining and healthy trees dispersed evenly throughout a block
- dead and declining trees with a full load of large fruit suggesting a very rapid decline/death in a single season
- severe shedding of bark around the tree’s graft union
- large, solid, dark brown cankers above and below graft union
- rootstock often sending up green suckers

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TriFoCap PCR and ELISA testing for a small, specific set of plant viruses yielded no conclusive viral cause for the decline, but “latent” viruses were found in most samples. In 2015, PDA and PSU visited the Bedford County site that had not been visited in 2014. Honeycrisp and Gala on M9 were suffering from the same decline seen at other sites in 2014. Several whole trees were dug out of the ground and brought to PDA for careful examination by PDA plant pathologists. Molecular testing for fireblight, phytoplasma, and *Phytophthora* yielded no positive results. ELISA positives for apple stem pitting virus and apple stem grooving virus were obtained from various leaf samples; TriFoCap RT-PCR also yielded positive results. The causal agent(s) of the decline are still unresolved.



Symptoms of rapid apple decline seen at various apple orchards in PA in 2014-2015.



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## ENTOMOLOGY DIVISION

The Entomology Program is responsible for the regulation of invasive insect plant pests, which includes survey, laboratory analysis, and control/mitigation when warranted. In 2015, the Entomology Program either conducted or actively participated in 13 invasive insect pest surveys across the Commonwealth. The laboratory received and processed 11,319 different insect samples and identified 99,063 specimens from these samples. Regardless of the survey, all samples were screened for important groups of insect pests: Cerambycidae, Buprestidae, Scolytinae, Pentatomoidea, Siricidae, Symphyta, Vespidae, and Fulgoroidea as well as for select species like *Drosophila suzukii* (Spotted Wing Drosophila), *Sirex noctilio*, *Larinus turbinatus*, *Adelges tsugae* (Hemlock Woolly Adelgid), *Lycorma delicatula* (Spotted Lanternfly), 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 Penn State extension, private industry, and the general public.

### Spotted Lanternfly (SL):

**The cooperative response to eradicate SL by the community, local governments, individual property owners, businesses, state agencies, researchers, and the federal government has been a refreshing experience and the Entomology Program extends a sincere thank you to everyone who has dedicated time, expertise, and resources to this effort.**

On September 22, 2014, 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). A brief delimiting survey indicated a population that was limited in distribution and a quarantine was established late in 2014 to contain the pest in its known area.

Early in 2015, the USDA assisted PA by conducting a tree chipping study to see if SL egg masses could survive chipping. This study was monitored by PDA until all viable



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eggs hatched. Results showed that no eggs from the chipped material hatched, while a high percentage of the un-chipped eggs had hatched. In addition, the US Forest Service placed temperature collection devices at the core of the infestation to help determine growing degree information. Groups of community volunteers were also trained to scrape SL egg masses and report their efforts to PDA.

In March of 2015, PDA was awarded emergency Farm Bill funding to attempt eradication of SL, and cooperators were awarded funding for research and outreach. PDA designed and implemented a plan to control population growth in the core of the infested area, and to engage the public to assist with this control and with identifying the full extent of the pest's distribution. In April of 2015, 22 property owners who were documented to have infestations were trained to use brown sticky tree bands to trap immature SL. Eighteen PDA SL crew members were hired to band trees on non-volunteer properties and to work with volunteers to keep the effort coordinated. The crews started working the first week of May, and were aided by having District Township donate a staging area for the crews to operate from. The program targets were to band 10,000 trees, and maintain these bands until the end of November. The combined number of trees banded by volunteers and PDA SL Crews was 6,520 trees which resulted in the death of 189,926 SL. The bands were selected due their ease of use, quick deployment, and relatively low cost and environmental impact. Other program control methods require additional preparation and could not be deployed as quickly.



The bands were extremely effective through the 3rd larval instar, but seemed to have limited ability in capturing late instars and adults. For this reason, the SL Crews developed an active capture technique using the bands which allowed for continued control through the fall months. After SL started to deposit egg masses, the crews and volunteers switched from active capture to egg mass scraping, and this effort resulted in the death of an additional 603,645 SL. As a result of the volunteers and crews recording their control efforts, PDA was able to identify a number of properties with the highest populations where some enhanced control tactics could be implemented. The owners of these properties were issued treatment orders which detailed the tree removal/trap tree procedure.

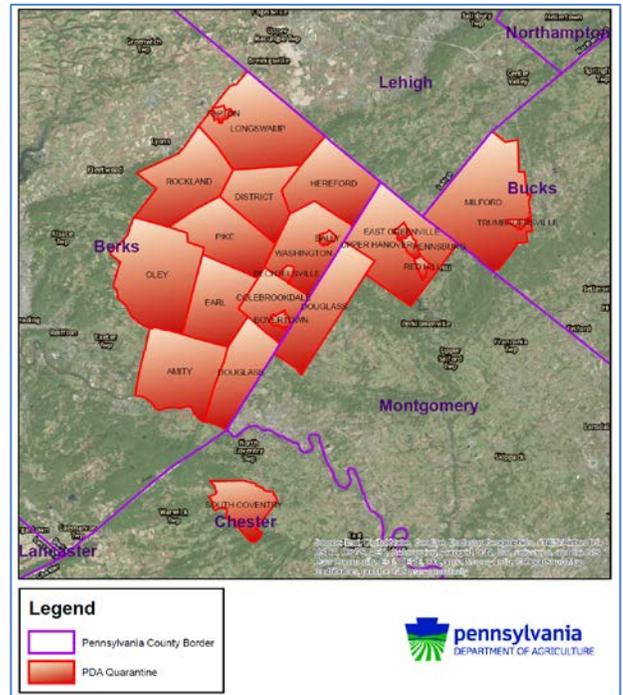
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Because the SL will feed on many different species when it is developing, it is difficult to deliver effective control in an efficient way. As SL matures, it starts to congregate almost exclusively on tree of heaven, and evidence seems to indicate that

females are required to feed on tree of heaven before they lay eggs. For this reason PDA developed and implemented a strategy to remove most tree of heaven from infested properties but leaving a few trees as trap trees which are treated with a systemic insecticide. SL that remain on these properties are left only a few treated trees on which they can complete their life cycle. After feeding on the treated trees they die. A contractor was selected by bid and has completed the tree removals on all of the selected properties with trap tree insecticide treatment scheduled for May of 2016. The populations at these high-count sites will be monitored. Efforts by the crews and volunteers helped to identify many new infested areas over the course of 2015, which led to the expansion of the quarantine and a better understanding of the scope of the infestation.

The public is extremely effective and helpful for reporting new locations. These public reports led to the discovery of infestations in three new counties (Bucks, Chester, and Montgomery) and a number of new townships in Berks County. By the end of 2015, SL was known to be present on 435 properties. The heaviest infestations are centered around the initial point of detection, and most of the remote populations in new townships and counties are comprised of only one or two specimens. The quarantine restricting the movement of SL life stages and conveyances has been extended.



In 2016, PDA plans to expand the volunteer banding program, continue mechanical control efforts, and greatly expand the number of tree removal/trap tree properties.

## 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

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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 2015. 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 2015 PDA performed visual survey at 228 sites. No ALB was detected in PA in 2015. PDA intends to continue visual surveillance in 2016.

### USDA Exotic Wood Boring Beetle Survey:

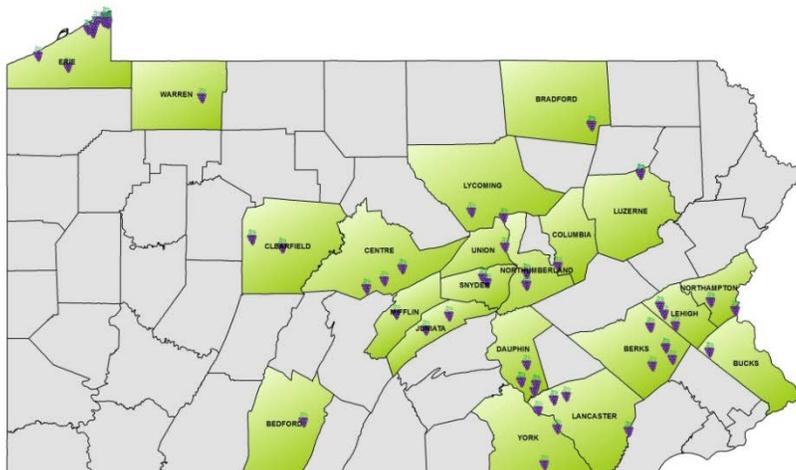
In May of 2015, the USDA-APHIS PPQ office out of Carlisle PA, established 109 traps at high-risk sites in 11 PA counties that receive shipments of products originating outside of the United States. Facilities targeted were known to have received shipments that contained pests from abroad in the past. The traps were serviced every two weeks until the end of October. A total of 864 samples were submitted to the PDA Entomology Laboratory for analysis. This survey targeted a combination of different wood destroying beetles not known to occur in the United States. None of the USDA target pests were detected, but 24 specimens of the camphor shot borer, a non-native ambrosia beetle recently found in PA were trapped in York County for the first time and 8 were trapped in Lehigh County.



### 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 2015. The survey was run from April until the end of June, completing the 2014 project, and the 2015 grape commodity pest survey started on July 1 and ran until the end of October. The 2015 project will resume in April of 2016 and conclude June 30, 2016.

Target pests for 2014 included *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 addition, the recently detected Spotted Lanternfly (*Lycorma delicatula*) was added as a target pest at all known vineyards.



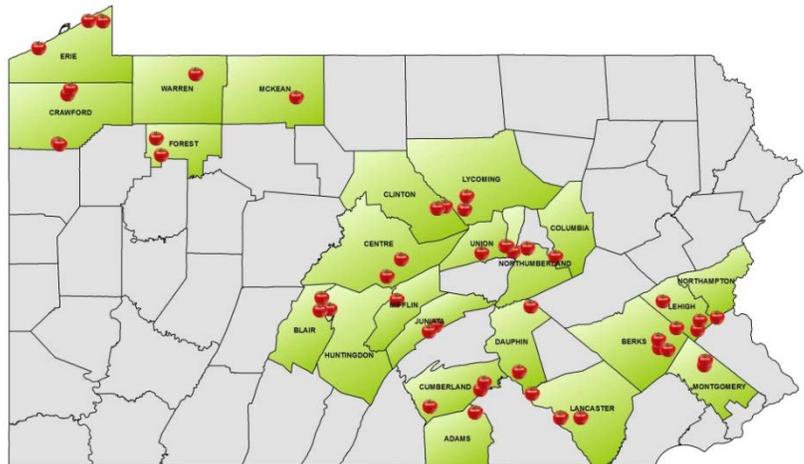
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In the spring of 2015, survey crews established 572 sites in 21 PA counties at farms supporting wine and juice production. The PDA lab received and processed 2,124 samples which contained 3,318 specimens. No targets were detected in 2015. Surveys did detect 30 specimens of *Autographa* which were not *Autographa gamma* and 2 specimens of *Platynota* which were not *Platynota stultana*. All vineyards surveyed were negative for Spotted Lanternfly. The grape commodity survey will resume in April of 2016.

### 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 2015. 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 2014 project target pests were *Tuta absoluta* (tomato leaf miner), *Chrysodeixis chalcites* (golden twin spot moth), *Diabrotica speciosa* (cucurbit beetle), *Helicoverpa armigera* (old world bollworm), *Neoleucinodes elegantalis* (tomato fruit borer), and *Bactericera cockerelli* (tomato/potato psyllid). Seasonal surveyors deployed 470 sites in



23 counties at tomato processing facilities, retail food distribution centers, as well as at some tomato production sites. Surveyors submitted 2,298 samples throughout the 2015 season which contained 3,265 specimens, all of which were negative for the target pests. Traps did collect 5 specimens of other moths in the Family Gelechiidae that were not *Tuta absoluta* and 26 Moths in the Genus *Chrysodeixis* which were not *Chrysodeixis chalcites*. Traps also collected 493 moths in the genus *Helicoverpa* which were not *Helicoverpa armigera*. This survey will resume in April 2016.

### Cut Flower Survey:

For many years PDA has worked closely with members of US Customs and Border Protection, sharing information that leads to targeted surveys and 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

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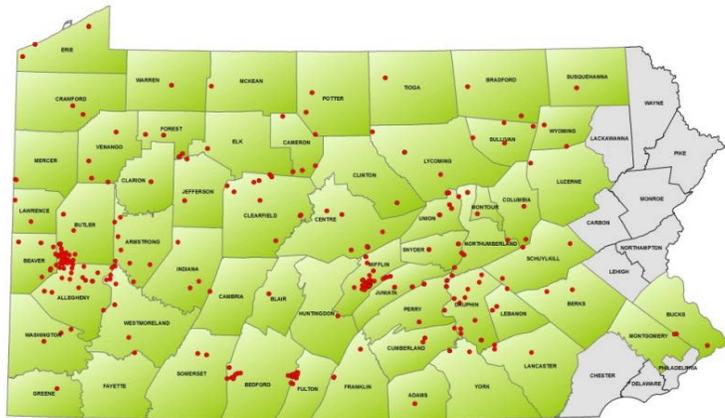
nine cut flower distributors in six counties, where they generated 46 samples. The samples contained 80 insect specimens, including beetles, flies, aphids, and the target, thrips. Two of the thrips identified were not native to PA, including *Thrips palmi* and *Frankliniella panamensis*. Though these 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 and this effort was continued in 2015. Inspectors visited 73 sites in 37 counties in 2015. A total of 416 samples were submitted that contained 13 specimens, none of which were targets. This survey has concluded and may be re-instituted every few years.

### **Emerald Ash Borer (EAB):**

2015 marked the eighth year since the Buprestidae beetle *Agilus planipennis* was discovered in Butler County and the fifth 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 fifth year of bio-control efforts by our cooperating agency (DCNR), and the fifth season of the tropical ash rearing project to support the production of bio-control agents.



At the beginning of 2015 there were 55 counties with confirmed populations of EAB known in PA, and no official survey work was performed by PDA in 2015. In 2015 official confirmed samples were obtained from McKean and Lancaster Counties. These new detections bring the total number of infested PA counties to 57 as of January 1, 2016.

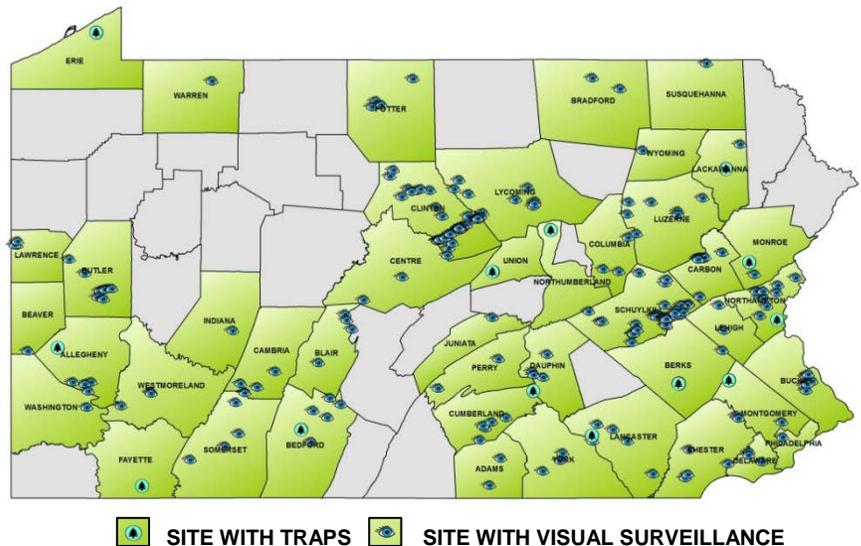
Over 350 *Farinas uhdei* (tropical ash) were started from seed in July 2011 to support the rearing of EAB biological control agents at the National Rearing Lab in Brighton, MI. Germination and initial growth of the seedlings continued through December 2011. In 2012 the ash trees were cut back and an initial shipment of 400 leaves and a number of cut back

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trees were sent to Michigan in May. Starting in November of 2012, regular shipments of leaves were made (as need dictated by the rearing lab in Brighton) and this program continued through the end of 2015. In 2015, regular shipments were made each week from February through June, and September through December, totaling 9,880 leaves and 581 boles. Currently there are 149 trees maintained in the greenhouse at PDA.

### 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 2015, insects affecting oak, sassafras, conifers, and other Northeastern hardwoods 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 have a limited distribution. Information from the interception of pests at ports provided by the US Customs and Border Protection, 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, 13 sites were established at sites deemed high-risk for exotic pest introduction with 105 variously 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 1,488 samples and 29,149 specimens. Detections of note included 50 specimens of *Cnestus mutilatus* (Camphor Shot Borer) from the same site in Montgomery where it was first detected in the state in 2013. Five specimens of *Sirex noctilio* were trapped in Lackawanna County. One specimen of *Lycorma delicatula* was trapped in Montgomery County, which was a new county detection for this pest.

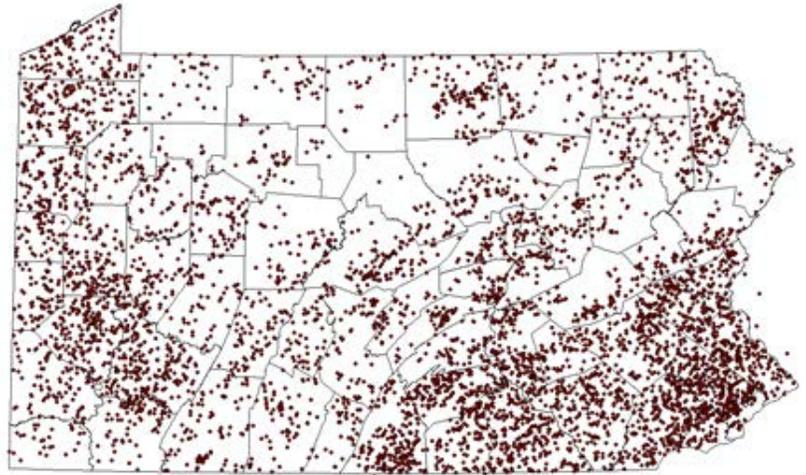


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known positive counties. The DCNR placed and monitored several traps in Bucks, Montgomery, Chester, and Delaware Counties which are counties currently under state quarantine. The state of MD requested assistance with the processing of samples from MD which PA agreed to identify. In all, PDA received and processed 1,647 samples containing 20,491 specimens. A total of 19 *Pityophthorus juglandis* were collected in 2015 in PA, all from the original detection site in Bucks County. No new locations were identified in 2015 and the quarantine was not expanded. PA will resume this project in April 2016.

### **Apiary Inspection Program:**

The value of the apiary industry in Pennsylvania in 2015 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, more than 3,000 new beekeepers have registered since 2007, including more than 500 new beekeepers registering in 2015. Currently, in PA there are more than 4,000 registered beekeepers managing approximately 63,000 colonies in 6,000 bee yards. 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 seven full time seasonal Apiary Inspectors working across Pennsylvania as well as the State Apiarist located in Harrisburg. Approximately 20% of beekeepers registered in PA had their honey bee colonies inspected.

### **Honey Bee Diseases and Pests:**

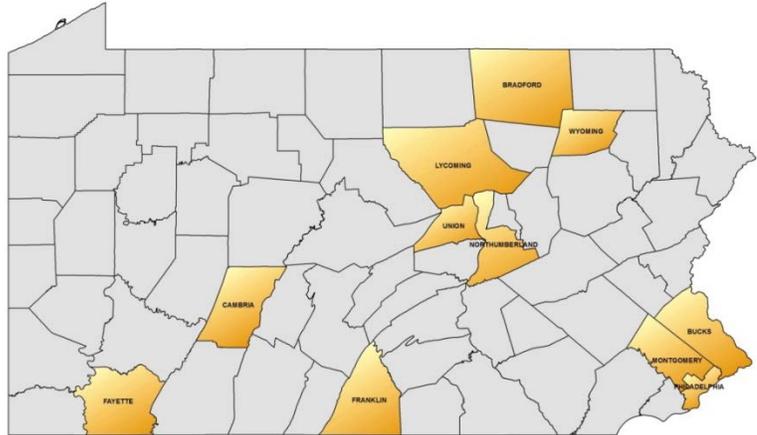
Twenty-nine cases of American Foulbrood (AFB), a highly contagious disease affecting honey bees, were detected in 11 counties in PA in 2015. The PA Department of Agriculture continues to focus on detection and treatment of AFB.

All suspect cases of AFB were submitted to Harrisburg and then sent on to the USDA lab in Beltsville MD for laboratory testing to confirm the diagnosis and to screen for Oxytetracycline hydrochloride, (trade name Terramycin) resistance. Twenty-two of the AFB strains were susceptible and therefore the symptoms are treatable with the antibiotic Oxytetracycline HCL and seven were resistant to Oxytetracycline HCL. Resistant strains of AFB may be treated

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with the veterinary antibiotic tylosin (trade name Tylan) 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. They are more prevalent in the southern and mid-sections of the state.



### Apiary Permits Issued:

The Pennsylvania Department of Agriculture (PDA) issued 32 Certificates of Inspection to process export permits for beekeepers requesting permission to allow honey bees and/or used equipment to leave PA (35 were issued in 2014). There were 8 Import Permits issued to allow honey bees and/or used equipment to enter PA from other states (12 were issued in 2014). Eighty-six queen producer/nuc-selling beekeepers were issued permits to sell queens and nucleus colonies in Pennsylvania in 2015 (53 were issued in 2014).

### National Honey Bee Survey:

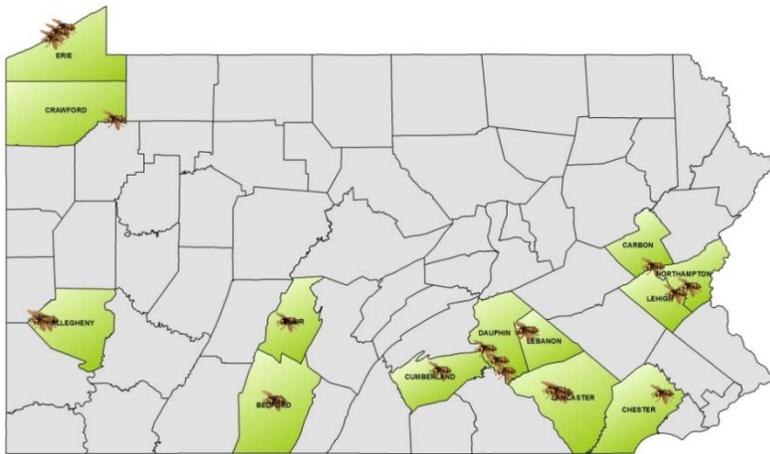
This was the fifth year that Pennsylvania was able to participate in the USDA/APHIS National Honey Bee Disease Survey (NHBS). The objective of this survey is to determine the diseases, pests, and parasites present, or absent, in various operations throughout the United States, including a cross-section of operation types. The diseases, pests, and parasites include: American Foulbrood, European Foulbrood, Sacbrood, Chalkbrood, Parasitic Mite Syndrome, *Nosema sp.*, Idiopathic Brood Disease Syndrome (IBDS), Lake Sinai Virus-2 (LSV-2), Acute Bee Paralysis Virus (ABPV), Chronic Bee Paralysis Virus (CBPV), Kashmir Bee Virus (KBV), Israeli Acute Paralysis Virus (IAPV), Slow Bee Paralysis Virus (SBPV), Deformed Wing Virus, Black Shiny Bees, Small Hive Beetles, Wax Moths, *Varroa* mites, *Apis cerana* and *Tropilaelaps* mites.

The survey also records the status of the queen. Live bee samples are sent for virus testing. As of December 2015, 17 of the 24 apiaries have been sampled. The remaining seven will be completed in the spring of 2016.

### Asian Giant Hornet:

Asian Giant Hornet, *Vespa mandarinia*, (AGH) gained national notoriety when it was featured in a Discovery Channel program where it was portrayed as a significant threat to apiaries and as a human health threat. AGH made international news in 2013 when conditions in China led the insect to cause 42 deaths. A review of PA regulatory authority identified that there was a

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gap which might not allow for rapid response should the pest be introduced in North America. In 2015, PA was awarded a Farm Bill grant to survey for AGH in PA and to develop a response strategy should the pest be detected.

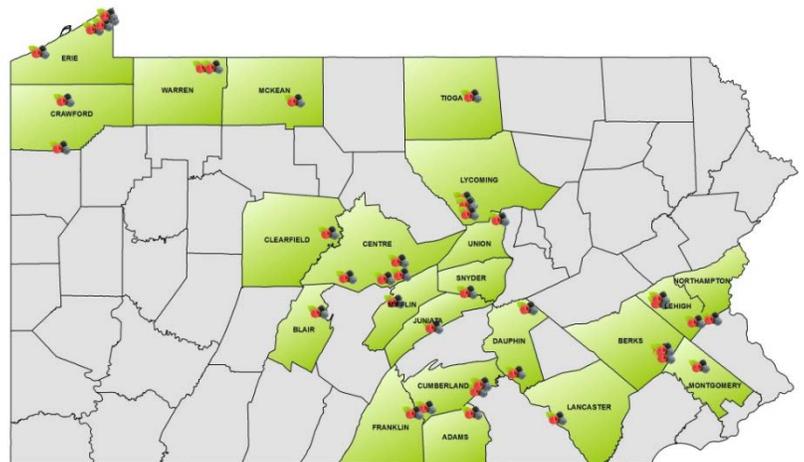
In 2015, 72 high risk sites, including international airports, ports, shipping, rail, and truck transportation hubs were established in 13 counties. Traps were established July through

September by six apiary inspectors, two federal surveyors, and one PA Department of Agriculture entomology field worker. Two types of traps and three types of bait/lure were used. White translucent one gallon jugs were hung from trees and held either one cup of light or dark brown sugar and ½ gallon of water. Black Lindgren Funnel traps with ethanol lures were the second type of trap. Traps yielded 219 samples which contained 5,187 specimens. No Asian Giant Hornets were identified in 2015 but traps did collect 353 *Vespa crabro* (European hornet) which is often mistaken for the target pest. Plans are underway to continue the survey while also testing additional trap and lure combinations in the spring of 2016. Additional sites are being secured in high-risk areas.

In addition, educational handouts are also being prepared. A presentation was made about the AGH survey at the annual PA State Beekeepers Association meeting and numerous presentations are scheduled for local beekeeping groups. In January 2016, at the Apiary Inspectors of America meeting, a cooperator meeting was held with other participating states and information was presented to State Apiarists and Apiary Inspectors. There was a great deal of interest in the AGH program and the participants were able to start drafting a framework response should AGH be detected.

## Small Fruit Commodity Pest Survey:

The Port of Philadelphia has long been a chief port for the importation of fruit into the Eastern part of the country. In recent years there have been interceptions of Mediterranean fruit fly in New Jersey and in Philadelphia. New fruit feeding flies like spotted wing drosophila and Drosophilid fig fly have established and spread in PA. For these reasons, PDA sought Farm Bill Money to survey for exotic fruit fly pests of small fruit. This survey targeted Spotted Wing Drosophila



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(*Drosophila suzukii*), Drosophilid Fig Fly (*Zaprionus indianus*), Mediterranean Fruit Fly (*Ceratitis capitata*), Malaysian Fruit Fly (*Bactrocera latifrons*), other *Bactrocera* species, and South American Fruit Fly (*Anastrepha fraterculus*) at growers or processors of blueberries, strawberries, cane fruits, or other small fruits. PDA crews established 147 sites in 22 counties that were run from July through November 2015. Traps yielded a total of 553 samples with 5,397 specimens, which were identified at the PDA laboratory with the use of permanent and seasonal taxonomic staff. Two targets were identified in 2015, including 312 specimens of *Zaprionus indianus* and 4,498 specimens *Drosophila suzukii*. No specimens of *Bactrocera*, *Ceratitis*, or *Anastrepha* were collected. This survey will resume in the spring of 2016, but was not funded beyond the end of June and will be discontinued.

### 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. In addition, plant inspectors are asked to target certain pests of concern during their inspections.

In 2015, plant inspectors were asked to look for *Stephanitis pyrioides* (azalea lace bug) and *Euwallacea* sp. near *fornicatus*. Populations of azalea lace bug have been causing mortality in nurseries of Pacific Northwest states in recent years and an unnamed species of bark beetle that is similar to *Euwallacea fornicatus* has been causing tree mortality in Southern California.

A total of 111 samples were submitted in 2015. Six of the samples were lace bug samples and of those two were *Stephanitis pyrioides*. No significant damage resulted from the lace bugs. The most notable PDSR was submitted late in 2015 and was a new state record for *Eupteryx decemnotata* (Ligurian leaf hopper) found in Cumberland County. *Eupteryx decemnotata* is native to Southern Europe and has been established in California and Florida. It is a known pest of mints, and other herbs like sage, rosemary, marjoram, oregano and Thyme.

This was the first detection of this pest in Pennsylvania where it caused 100% mortality to rosemary plants in a commercial greenhouse. The greenhouse was dedicated to parent plants for propagation and the grower initiated voluntary control. No additional locations at the property show signs of infestation, but the site will be closely monitored and plant inspectors will target this pest in 2016 inspections where herbs are grown.

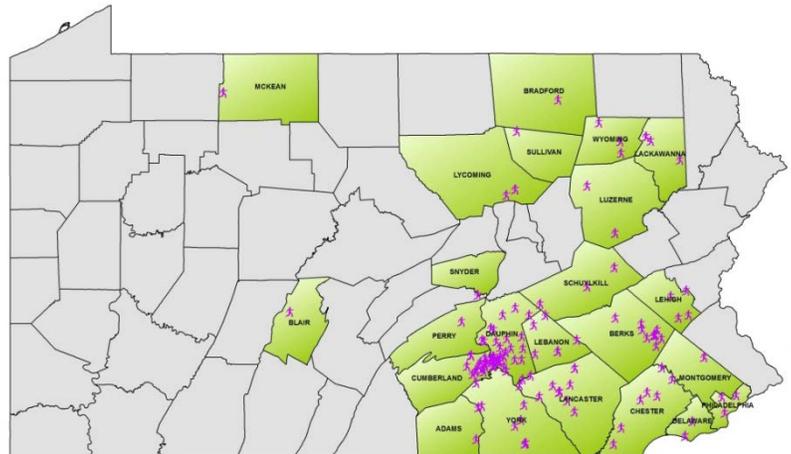
**Eupteryx  
decemnotata**



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## General Survey Samples and Other Detections of Note:

In addition to mandated and funded surveys, the PDA Entomology program also receives samples from Penn State 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 Extension. In 2015, PDA recorded 253 samples totaling 2,892 specimens. Most identifications provided for the general survey were of common household or yard pests. Four significant finds resulted from the general survey in 2015.



**Exotic snail interception:** PDA was contacted by a quality control worker from a Berks County company that imports product for production. They collected several specimens of an unknown snail inside truck bodies with newly delivered product. They took quick action to segregate the shipment, line the trucks with a border of salt and inspect the rest of the shipment, finding snails in four total truck bodies. The snail was identified as *Cathaica fasciola* (a Bradybaenid land snail) that is widely distributed in China and causes significant losses to economic crops. The snail is considered to be actionable by the USDA and the USDA worked with the company who voluntarily had the containers fumigated. PDA Entomology conducted a delimiting survey at the site, and

only native snails were collected. The site will be monitored in 2016.

**Lily Leaf Beetle:** Two separate sites for *Lilioceris lili* (Lily leaf beetle) were turned into PDA plant inspectors by homeowners in Luzerne and Lackawanna Counties. *Lilioceris lili* is serious pest of Asiatic lilies that has been present in Northeastern North America for many years. In 2013, a single infested plant was reported from Clinton County by Penn State Extension, the first record in Pennsylvania. Controls were initiated at the Clinton County site and no additional records from Clinton County. Plants in Luzerne and Lackawanna Counties were treated by the property owners, and the two sites will be monitored for presence of the pest in 2016.



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**Black Fir Sawyer:** PDA was contacted by a professor from Millersville University who had received a live Cerambycidae adult from a quality control worker at a Lancaster County food production plant. The specimen had hatched out of wooden pallets that originated in France, and PDA teamed up with the USDA to inspect other pallets at the site. Additional live Cerambycidae larvae were extracted from the pallets. The original specimen was identified by PDA as *Monochamus galloprovincialis* (Black Fir Sawyer), a pest of spruce known from Europe. Working with USDA-APHIS, the company destroyed more than 200 pallets. A delimiting survey was set up around the facility by PDA who established 6 traps that generated 39 samples and 219 specimens. Of these, one *Monochamus scutellatus* was trapped, and no other non-native Cerambycidae were trapped. This site will be monitored in 2016.



**Onion Leaf Miner:** In late December 2015, PDA was contacted by PSU Extension from Lancaster County for confirmation of an identification of a pest causing 100% mortality of Allium crops on an organic Community Supported Agriculture (CSA) farm. The original sample contained pupae and one larvae of a fly that was identified as *Phytomyza* sp. To speciate *Phytomyza*, a mature adult male specimen is required. PDA Entomology, a representative from the USDA, and PSU Extension visited the grower and obtained samples of infested Leek and Onion which were reared out in containment at PDA.



These specimens emerged the first week of January 2016 and were identified as *Phytomyza gymnostoma* (Onion Leaf Miner) which is a "First in Nation" detection. The Agromyzid fly is native to Asia and is a serious pest of Allium crops in Europe.

An investigation indicated that the grower had been experiencing moderate loss to this pest in previous years, but it had grown worse this past season, eventually causing complete crop loss of his leek and fall onions. A pathway for introduction to this farm has not been determined, and a delimiting survey and state-wide survey will be conducted by PDA in 2016. PDA will also be educating growers throughout the state and region, and asking for reports of damage matching this new pest.

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Literature indicates that the onion leaf miner has two generations per year. The first generation adults emerge in the early spring and preferentially infest onion and garlic. The second generation emerges in the fall and prefers leek, though at the original detection site, both the leek and fall planted onions suffered 100% loss. Spring onions being grown in a hoop house at the farm displayed 40% damage, and specimens were collected from chives, though no damage was evident.

The adult flies are gray with an orange head, but growers will most likely notice the mining of the larvae at the base of Allium leaves or the light-brown rice-shaped pupae, which are easily found in between layers on leeks or inside onion leaves. Growers who suspect that they have onion leaf miner should contact PSU extension or the PDA Entomology Program. PDA is working with PSU to develop a pest alert and grower recommendations. A new pest advisory group was formed by the USDA which will provide a report with information about the pest and recommendations.



### **Invasive Species Hotline and E-Mail Report System:**

In 2015, the invasive species hotline (1-866-253-7189) and e-mail account ([Badbug@pa.gov](mailto:Badbug@pa.gov)) generated 640 contacts to report possible invasive insects and the Entomology Program received an additional 125 reports from direct mail, telephone calls, and other modes of contact. Of the 765 contacts, 400 were to the toll-free automated invasive species line and 240 were to the badbug e-mail. The majority of public contacts was to report or ask about Spotted Lanternfly or Emerald Ash Borer.



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