CONNECTICUT

REPORT TO THE EASTERN PLANT BOARD - 2015
PORTSMOUTH, NEW HAMPSHIRE

SUMMARY OF 2014 NURSERY INSPECTIONS, FOREST INSECT/PLANT PEST SURVEYS

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NURSERY INSPECTION AND CERTIFICATION

Two-hundred two nurseries were certified to conduct intra- and interstate business. There were 697 nursery inspections during the growing season.

NURSERY INSECTS and DISEASES. The most important diseases and pests found in nurseries (in order of prevalence) were aphids on various trees and shrubs, boxwood leaf miner, Rhododendron leaf miner, imported willow leaf beetle, and lily leaf beetle.

JAPANESE BEETLE CERTIFICATION. We observed treatments of five hundred forty nine plants at one nursery and issued phytosanitary certificates to comply with states that quarantine nursery stock from Connecticut because of the Japanese beetle, Popillia japonica.

Four nurseries met other requirements of the United States Japanese Beetle Harmonization Plan and shipped 2,936 plants to states that quarantine plants from Connecticut.

JAPANESE BEETLE CERTIFICATION TO CANADA. Eight Connecticut nurseries, which met the inspection requirements of the US/Canada Japanese Beetle Harmonization Plan, shipped 35,686 plants to Canada in 2014.

NURSERY DEALER PERMITS. Nursery dealer permits were issued to 182 firms. One-hundred fifty of these companies operate individual outlets. The remaining businesses have more than one outlet each. In total, there were 597 outlets.
EXPORT CERTIFICATION

INTERNATIONAL. Two hundred seventy nine phytosanitary inspection certificates were issued covering the shipment of the following plant materials to destinations outside the United States. One hundred two consignments were bound for the Dominican Republic (tobacco), seventy three to Canada (ornamental plants), and twenty one to Honduras (tobacco).

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples (Cartons)</td>
<td>6,000</td>
</tr>
<tr>
<td>Bulbs &amp; Tubers (Dahlia &amp; Gladiolas) (# Bags)</td>
<td>262</td>
</tr>
<tr>
<td>Bulbs &amp; Tubers (Dahlia &amp; Gladiolas) (Kilos)</td>
<td>9</td>
</tr>
<tr>
<td>Chinese Tree Peony (plants)</td>
<td>30</td>
</tr>
<tr>
<td>Greenhouse plants</td>
<td></td>
</tr>
<tr>
<td>Rhizomes</td>
<td>122</td>
</tr>
<tr>
<td>Cuttings</td>
<td>102</td>
</tr>
<tr>
<td>Nursery stock</td>
<td></td>
</tr>
<tr>
<td>Unrooted cuttings</td>
<td>231</td>
</tr>
<tr>
<td>Plants (B and B)</td>
<td>19,623</td>
</tr>
<tr>
<td>Bare root plants</td>
<td>14,773</td>
</tr>
<tr>
<td>Orchids (plants)</td>
<td>2,845</td>
</tr>
<tr>
<td>Perennials</td>
<td></td>
</tr>
<tr>
<td>Bare root plants</td>
<td>1,037</td>
</tr>
<tr>
<td>Potted plants</td>
<td>12</td>
</tr>
<tr>
<td>Seeds (bags)</td>
<td>335</td>
</tr>
<tr>
<td>Seeds (kilos)</td>
<td>24</td>
</tr>
<tr>
<td>Seeds (pallets)</td>
<td>10</td>
</tr>
<tr>
<td>Seeds (vials)</td>
<td>1</td>
</tr>
<tr>
<td>Tobacco</td>
<td></td>
</tr>
<tr>
<td>Bales</td>
<td>52,306</td>
</tr>
<tr>
<td>Bundles</td>
<td>25,946</td>
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<tr>
<td>Cartons</td>
<td>33,900</td>
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<td>Pounds</td>
<td>100</td>
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<tr>
<td>Walnut shells (bags)</td>
<td>3,717</td>
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<tr>
<td>Walnut shells (drums)</td>
<td>332</td>
</tr>
</tbody>
</table>

HOUSEPLANT INSPECTIONS. Six inspections were made for 48 individual plants to assist homeowners moving out of state.

DOMESTIC. Ninety seven inspections were made to assist nurseries moving the following plants interstate. Eighteen consignments were bound for Washington, thirteen to New York, and eleven to California.

<table>
<thead>
<tr>
<th>Product</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursery stock (containers)</td>
<td>539</td>
</tr>
<tr>
<td>(bare root plants)</td>
<td>2,621</td>
</tr>
<tr>
<td>Greenhouse plants</td>
<td>1,151</td>
</tr>
<tr>
<td>Seed (# Bags)</td>
<td>50</td>
</tr>
<tr>
<td>Orchids</td>
<td>15</td>
</tr>
</tbody>
</table>
OTHER INSPECTIONS AND PERMITS

BIOTECHNOLOGY REGULATORY SERVICES INSPECTION ACTIVITY. In cooperation with officers from the Wallingford USDA-APHIS-PPQ office, eight inspections were conducted in 2014 at facilities or laboratories working with recombinant or regulated organisms.

PERMITS TO MOVE LIVE PLANT PESTS, NOXIOUS WEEDS, AND SOIL. In 2014, there were sixty-nine PPQ 526 Permits (Permit to move live plant pests, noxious weeds, and soil) approved in CT. There were two PPQ 525 Permits (Permit to move soil) approved in CT. There were three Controlled Import Permits issued.

FOREST HEALTH

During the summer of 2014, we examined 51 permanent, one-acre forest plots that were established to monitor forest health in Connecticut. These plots are located on state, Nature Conservancy, and municipal water company properties. We considered 25 pathogens for monitoring and determined which trees served as host plants. Within each plot, 20 to 30 trees were tagged for long-term studies. We evaluated signs of defoliation and disease, such as dead tree branches, limbs and crowns. Descriptions and determinations are designed to reflect increasing damage or tree decline. We measure the trees at Diameter at Breast Height (DBH) as an additional way to monitor their health. We will continue to use these plots to monitor the forests over several years to assess whether our state forests remain healthy or are declining. In general, our forests remain healthy.

ENVIRONMENTAL CONDITIONS. A hailstorm in May 2014 caused damage to almost 95 acres in Litchfield County. Summer was cool and dry, with dry conditions persisting into autumn. In addition, the touchdown of a small tornado caused damage on over 40 acres.

INSECT AND DISEASE SURVEYS

BOXWOOD BLIGHT. Boxwood blight [Calonectria pseudonaviculata (syn. Cylindrocladium pseudonaviculatum)], was detected at one nursery on plants that originated in North Carolina. Plants were destroyed and the area disinfested. No boxwood blight was detected at any production nursery on plants originating in CT. Home owners continue to report boxwood blight on plants in landscapes. Efforts continue to educate landscapers about boxwood blight and its consequences.

CHRYSANTHEMUM WHITE RUST. In 2014 we inspected 133,855 plants for CWR, caused by Puccinia horiana. No positives were detected.

GYPSY MOTH. We observed defoliation due to Gypsy Moth on 1,337 acres, mostly in New Haven County, in 2014. In November and December 2014, a gypsy moth egg mass survey will be conducted in 80-95% favorable host sites on a 7-mile grid (102 sites) throughout Connecticut.

ASIAN LONGHORNED BEETLE. We conducted 120 inspections of 10,007 trees in all counties of CT for presence or signs of ALB infestation.

HEMLOCK WOOLLY ADELGID and ELONGATE HEMLOCK SCALE. This pest has been present in CT for many years, and continues to cause patchy damage and decline among the remaining population of hemlocks. Statewide in 2014, 186 acres were affected by HWA. Scale insects, such as elongate
hemlock scale and circular scale, are increasing in some areas. Over 9,146 acres statewide were affected by elongate hemlock scale.

**RAMORUM LEAF BLIGHT.** There were three trace-forward actions involving *P. ramorum* in CT in 2014. Potentially infested host material was shipped to many private home owners. A total of nine samples were collected; one was found to be positive. All positive materials were destroyed by disposal in the municipal waste stream, which leads to incineration.

**DAYLILY RUST.** During 2014 we surveyed daylilies in nurseries and garden centers for signs of daylily rust, caused by *Puccinia hemerocallidis*. Seventy six inspections (67,322 plants) were conducted.

**SPOTTED LANTERN FLY.** There was one trace-forward action involving spotted lantern fly (*Lycorma delicatula*). Stone and stone products from an area where SLF had been detected were inspected for presence of egg masses. Marble, slate, and granite stones were unpacked, carefully moved, and examined. Numerous dead brown marmorated stink bugs were found. Host plants of SLF in areas adjacent to stone yards were also inspected.

**EMERALD ASH BORER.** Emerald ash borer has been detected in six counties; the quarantine for this insect was extended statewide to encompass all of Connecticut. Detections efforts include trapping using purple panel traps and monitoring of *Cerceris* colonies. During aerial survey, we mapped 2,456 acres defoliated by EAB, and expect acreage and mortality to increase in the coming years.

*Contributed by Claire Rutledge.* This was the fifth summer we have been doing our Wasp Watcher program. We had about 70 volunteers this summer, with about 15 additional folks working with the White Memorial Conservation Center in Litchfield. Together with our Watchers we collected at least some beetles from 106 sites throughout the state. We collected the target of 50 beetles at 54 sites. Emerald ash borer was collected at 38 towns in 5 counties, some towns had detections at multiple sites. Of those towns, 27 were new detections for EAB. New detections were made in New Haven, Litchfield, Fairfield, Hartford and Middlesex Counties. Only one site where we had collected EAB last year did not yield additional EAB, and several towns where EAB had been detected previously using other survey methods had novel EAB collections. This year we started to see very obvious impacts of EAB, with large numbers of dying trees are apparent in many areas. This was reflected in our collections from the wasps, at sites in the core infestation area EAB comprised the majority of specimens collected from the wasps, at some sites there were no other species of beetles collected from the wasps.

To date this year, EAB has been detected in purple traps in 5 towns, one in Litchfield County as part of a surveillance program run by the White Memorial Conservation Center. Of the 4 remaining towns, 3 were in Middlesex, and 1 was in New London. This summer showed the complementary nature of the two detection techniques, as only one town had EAB detections by both.

**APIARY INSPECTION.** There are currently one thousand eighty registered beekeepers maintaining 6,400 hives. In 2014, nine hundred fourteen hives were inspected. American foulbrood was detected in six hives; these were destroyed by burning. Colony inspection determined Varroa mite infestation and the viral complex associated with Varroa infestation as the primary reason for colony mortality. CT beekeepers continue to lose colonies overwinter in higher numbers; the Bee Informed Winter Loss report for CT in 2014 was 39.45%. These losses are slightly higher than regional and nationwide trends. The viral pathogens that cause deformed wing virus (DWV), Israeli acute paralysis virus (IAPV), acute bee paralysis virus (ABPV), and even the rare chronic bee paralysis virus (CPBV) were detected in Connecticut as part of the USDA Honey Bee Pests and Diseases Survey. Due to high winter losses in
2014, local beekeepers struggled to replace losses with package bees from southern states. Despite these challenges, beekeeping interest is still strong with over 700 new beekeepers being trained this winter. There were one hundred four Apiary Certificate of Health Inspections performed. Three certificates were issued for export out of CT, and one hundred one certificates for interstate movement of honey bees.

2014 Connecticut IDS Data
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REPORT TO THE
EASTERN PLANT BOARD
Portsmouth, NH

2014 Activity Summary

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Cooperative Agricultural Pest Survey</td>
<td>3</td>
</tr>
<tr>
<td>Noxious Weed Control</td>
<td>7</td>
</tr>
<tr>
<td>Nursery Inspection and Certification</td>
<td>8</td>
</tr>
<tr>
<td>Seed Certification and Grain Inspection</td>
<td>10</td>
</tr>
<tr>
<td>Plant Regulatory Programs</td>
<td>12</td>
</tr>
</tbody>
</table>

Submitted by:

Faith B. Kuehn, Ph.D.
Plant Industries Administrator

April, 2015
Apiary Inspection

Annually, honey bees are responsible for pollinating $20 million of Delaware fruit and vegetable crops. This dollar amount is estimated at the “Farm Gate” level, not the wholesale or retail level.

### Apiary Inspection Unit Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certification of Honeybee Colonies for Interstate Transport</td>
<td>1,565</td>
<td>1,312</td>
<td>1,016</td>
<td>1293</td>
<td>1379</td>
</tr>
<tr>
<td>Certification of Honeybee Queen and Package Suppliers</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Honeybee Colonies Permitted for Entrance into Delaware</td>
<td>1,684</td>
<td>1,248</td>
<td>1,360</td>
<td>2146</td>
<td>2860</td>
</tr>
<tr>
<td>Evaluations of Pesticide Damage to Honeybee Colonies</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Stinging Insect Related Phone Calls</td>
<td>426</td>
<td>459</td>
<td>730</td>
<td>987</td>
<td>870</td>
</tr>
<tr>
<td>Information Provided to Public on Beginning Beekeeping</td>
<td>121</td>
<td>169</td>
<td>84</td>
<td>142</td>
<td>187</td>
</tr>
<tr>
<td>Educational Presentations</td>
<td>23</td>
<td>5</td>
<td>11</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td>Educational Displays &amp; Exhibits Presented</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Technical Workshops Presented</td>
<td>9</td>
<td>23</td>
<td>12</td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Basic Beekeeper Courses Presented</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Information Provided at Beekeeping Industry Meetings</td>
<td>17</td>
<td>12</td>
<td>5</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Successful Media Contacts</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Africanized Honey Bees

Africanized honey bees (*Apis mellifera scutellata*) continue to threaten agriculture in the U.S. and Delaware. So Delaware maintains pheromone-baited artificial nesting cavities along Delaware’s coast. Africanized honey bees were not found in Delaware.

### Africanized Honey Bee Trapping

<table>
<thead>
<tr>
<th>2014 Traps Set</th>
<th>Swarms Captured</th>
<th>African</th>
<th>European</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Brood Inspections

The State Apiarist registers and inspects honeybee colonies to protect the industry from costly diseases and parasites.

### Delaware Apiary Registration and Inspection

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Beekeepers</td>
<td>264</td>
<td>263</td>
<td>370</td>
<td>394</td>
</tr>
<tr>
<td>Registered Colonies</td>
<td>1,873</td>
<td>1,724</td>
<td>1,842</td>
<td>2,412</td>
</tr>
<tr>
<td>Brood Inspections</td>
<td>733</td>
<td>1,043</td>
<td>1,018</td>
<td>362</td>
</tr>
<tr>
<td>Apiaries Inspected</td>
<td>142</td>
<td>88</td>
<td>104</td>
<td>52</td>
</tr>
</tbody>
</table>
### Brood Inspection Results

<table>
<thead>
<tr>
<th>Honey Bee Disease / Pest</th>
<th>Infected / Infested Colonies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chalkbrood</td>
<td><em>Ascoaphaera apis</em> 88</td>
</tr>
<tr>
<td>Sacbrood Virus</td>
<td>11</td>
</tr>
<tr>
<td>American Foulbrood</td>
<td><em>Paenibacillus larvae</em> 19</td>
</tr>
<tr>
<td>European Foulbrood</td>
<td><em>Melissoccus pluton</em> 23</td>
</tr>
<tr>
<td>Tracheal Mite</td>
<td><em>Acarapis woodi</em> 100%</td>
</tr>
<tr>
<td>Varroa Mite</td>
<td><em>Varroa jacobsoni</em> 100%</td>
</tr>
<tr>
<td>Small Hive Beetle</td>
<td><em>Aethina tumida</em> 100%</td>
</tr>
</tbody>
</table>

### Education and Outreach

The Apiary Inspection Unit works with the Delaware Beekeepers Association to share technical information and provide training. Additionally, one apiary maintained at State Forest facilities provides observation colonies for classroom demonstrations and promotional exhibits. The apiary is also used during the annual beginner beekeeping course.

Provided technical assistance to the USDA Farm Service Agency ELAP program. In addition, we partnered with Delaware State University and Delaware Beekeepers Association to provide a beginner beekeeping course.

### Cooperative Agricultural Pest Survey

The Cooperative Agricultural Pest Survey program is a partnership between the Delaware Department of Agriculture (DDA), University of Delaware and USDA-APHIS. Surveys are conducted for pests not known to occur in or recently introduced to Delaware.

#### Red Imported Fire Ant Survey

Surveyed 3 sites where RIFA have been detected during previous years. Also inspected all palm trees brought into Delaware and nurseries that purchase plants from within the RIFA quarantine area. RIFA was discovered in one shipment of palm trees originating from Florida. A state control order for treatment was issued and evidence was collected. The find was reported to USDA-IES who opened an investigation. The site has been negative for RIFA since treatment. All other locations were also negative for RIFA.

#### Nursery-Based Bundled Survey

DDA conducted a survey for 8 pests in Delaware nursery stock. None of these target pests were detected.

*Asian Longhorned Beetle, Anoplophora glabripennis*
Oak Splendor Beetle, *Agrilus biguttatus*
Emerald Ash Borer, *Agrilus planipennis*
Quetta Longhorned Beetle, *Aeolesthes sarta*
Japanese Cedar Longhorned Beetle, *Callidiellum rufipenne*

Visual survey of host plants at 75 nurseries.

Goldspotted Oak Borer, *Agrilus coxalis*
Light Brown Apple Moth, *Epiphyas postvittana*

Traps at 15 nurseries.

Ramorum Blight, *Phytophthora ramorum*

Visual survey and sampling of symptomatic leaf tissue.

Forest Pest Survey

Wood-boring/Bark Beetle Survey
Traps were maintained for select pests from the Wood Boring/Bark Beetle Survey guidelines. No target pests were found.

Asian Longhorned Beetle
Experimental ALB traps were placed in industrial areas of Northern Delaware. ALB was not found.

Emerald Ash Borer
60 purple EAB traps were placed in ash stands throughout Delaware. EAB was not detected in any trap samples.

Walnut Twig Beetle
In 2013, Walnut Twig Beetle was discovered in Maryland 3 miles west of the Delaware state line. DDA placed 9 traps on the Delaware side of the state line near the infested site. The Delaware Forest Service also placed 6 traps statewide. Walnut Twig Beetle was not found in any trap catch.

Pine Shoot Beetle
Pine shoot beetle (*Tomicus piniperda*) traps were placed in pine stands between January and May 2014. Pine shoot beetle was not detected.

Delaware Plant Emergency Response Plan

DDA has compiled an Emergency Response Plan as a guide for responding to plant pest emergencies. The plan outlines agencies and stakeholders, legal authorities, personnel and communications. It also includes detailed response plans for 11 high-impact pests.

Each plan contains pest highlights, projected impacts in Delaware, survey methodology, identification protocols, and a practical discussion of likely responses to a positive find in Delaware. Response plans are periodically reviewed and updated.

Pests were ranked into three tiers which considered the pest’s potential for damage, public visibility, public health impact, level of regulatory response and feasibility of eradication.
Current and Significant Plant Pest Response Plans

<table>
<thead>
<tr>
<th>Rank</th>
<th>Pest</th>
<th>Rank</th>
<th>Pest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>Africanized Honey Bee</td>
<td>Other</td>
<td>Chrysanthemum White Rust</td>
</tr>
<tr>
<td></td>
<td>Red Imported Fire Ant</td>
<td></td>
<td>Ramorum Blight</td>
</tr>
<tr>
<td>Tier 2</td>
<td>Pine Shoot Beetle</td>
<td></td>
<td>Karnal Bunt</td>
</tr>
<tr>
<td></td>
<td>Asian Longhorned Beetle</td>
<td></td>
<td>Sirex Woodwasp</td>
</tr>
<tr>
<td>Tier 3</td>
<td>Emerald Ash Borer</td>
<td></td>
<td>Plum Pox Potyvirus</td>
</tr>
<tr>
<td></td>
<td>Asian Soybean Rust</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Forest Pest Outreach

The Delaware Department of Agriculture Forest Pest Outreach program was funded through the Farm Bill. Highlights from this project follow.

*Emerald Ash Borer Preparedness*

Since EAB is in all three adjacent states to Delaware, we concentrated on warning cities, parks, and community associations about the risk EAB poses financially due to the liability of dead street and park trees. We presented information at 7 technical meetings including the Delaware Arborist Seminar and worked with the City of Wilmington to develop an EAB Management Plan.

*Media*

We wrote a press release for Tree Check Month in August which was picked up by a statewide paper.

*Events and Presentations*

We staffed informational booths and distributed information on Forest Pests at 7 public events. We helped organize a special forestry seminar ‘Invading your Forest’ at Delaware Ag Week as well as an Emerald Ash Borer workshop for North Wilmington community leaders.

*Project-Related Facebook Posts*

<table>
<thead>
<tr>
<th>Page</th>
<th>Posts</th>
<th>Total Reach</th>
<th>Impressions</th>
<th>Engaged Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE Dept of Agriculture</td>
<td>48</td>
<td>5,528</td>
<td>12,430</td>
<td>395</td>
</tr>
</tbody>
</table>
**Noxious Weed Control**

**Delaware Noxious Weeds**

The list now includes six weeds with Johnsongrass (*Sorghum halepense halepense*), Canada thistle (*Cirsium arvense*), burcucumber (*Sicyos angulatus*), Giant Ragweed (*Ambrosia trifida*), Texas Panicum (*Urochloa texana*) and Palmer Amaranth (*Amaranthus palmeri*). Delaware law requires that these weeds not be allowed to reach 24 inches in height or set seed. Compliance agreements are used to formulate a workable control program.

**Other Weeds**

Mechanical and herbicide control was applied on selected sites containing kudzu (*Pueraria lobata*), Japanese knotweed (*Polygonum cuspidatum*), bamboo, Porcelain-berry (*Ampelopsis brevipedunculata*), and other invasive species. We continue to implement an equipment loan program to assist the public in the control of noxious weeds. We also assist with mile-a-minute biocontrol through University of Delaware insect share days.

**Noxious Weed Control Program Activities**

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landowners Contacted</td>
<td>1,013</td>
<td>1,015</td>
<td>1,153</td>
<td>1,454</td>
<td>1,393</td>
</tr>
<tr>
<td>Compliance Agreements</td>
<td>43</td>
<td>56</td>
<td>45</td>
<td>36</td>
<td>37</td>
</tr>
<tr>
<td>Acres Under Compliance Agreements</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>New Castle County</strong></td>
<td>10,450</td>
<td>9,570</td>
<td>10,570</td>
<td>6,007</td>
<td>7,250</td>
</tr>
<tr>
<td><strong>Kent County</strong></td>
<td>49,310</td>
<td>60,050</td>
<td>55,800</td>
<td>26,545</td>
<td>20,950</td>
</tr>
<tr>
<td><strong>Sussex County</strong></td>
<td>30,239</td>
<td>34,655</td>
<td>34,940</td>
<td>44,130</td>
<td>36,000</td>
</tr>
<tr>
<td>Equipment Days</td>
<td>1,809</td>
<td>1,640</td>
<td>1,570</td>
<td>1,812</td>
<td>1,504</td>
</tr>
<tr>
<td>Right-of-ways Sprayed</td>
<td>4,863</td>
<td>4,253</td>
<td>3,401</td>
<td>3,082</td>
<td>3,339</td>
</tr>
<tr>
<td>Violation Letters</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Court Cases</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Bamboo Phone Calls</td>
<td>31</td>
<td>37</td>
<td>50</td>
<td>60</td>
<td>32</td>
</tr>
<tr>
<td>Noxious Weed Phone Calls</td>
<td>75</td>
<td>85</td>
<td>91</td>
<td>98</td>
<td>123</td>
</tr>
<tr>
<td>Other Weed Related Calls</td>
<td>78</td>
<td>78</td>
<td>86</td>
<td>69</td>
<td>43</td>
</tr>
</tbody>
</table>

**Cooperative Efforts**

The Noxious Weed Control Supervisor is licensed by the American Society of Agronomy as Certified Crop Advisor. The Noxious Weed Control staff works closely with the University of Delaware Cooperative Extension Service, Maryland Noxious Weed Unit, USDA, DE State University, DE Dept of Transportation, and DE Dept of Natural Resources and Environmental Control regarding noxious weed issues.
**Compliance Agreements**

There has been a significant decrease in the number of compliance agreements and violations letters reported during the last five years. (Compliance agreements are lower this year due to an internal project during the time of agreement signup). In the past, the compliance form listed each farm separately but was recently modified to include all the land that each farmer tilled or all the land under each landowner’s control. This reduced the paperwork substantially while keeping the same acreage under compliance agreements. Genetically modified soybeans and corn have also reduced the number of violations. Finally, the conversion of farmland to housing and commercial development has reduced the number of infested acres under tillage.

**Weed Related Calls**

The noxious weed unit assists the public in identification and proper control procedures for invasive species. Upon request, a noxious weed specialist will visit the infested site and develop a control plan to eradicate the weeds while maintaining the desirable and/or native plants.

**Nursery Inspection and Certification**

Delaware's greenhouse and nursery industry reports $17.5 million in annual gross cash receipts. The Nursery Inspection and Certification Unit inspects nursery stock and Christmas trees for insect and plant disease pests. All nursery businesses must maintain a current Nursery Industry License from Plant Industries. Certification and inspections are conducted to prevent the introduction of unwanted plant pest into Delaware and to facilitate grower shipments of nursery stock to other states and countries.
Licensing

In 2014, 1,100 acres of production nursery stock were licensed and inspected. Plant Industries issued 749 nursery industry licenses, including 57 greenhouse operations, 2 plant brokers, 2 wholesale florist, 1 distribution center, and 7 mail-order businesses, as well as 30 new Nursery Industry Licenses.

Given the staffing shortage, the Nursery Unit concentrated on maintaining the nursery licensing and certification requirements and inspecting growers that needed certificates of inspection for interstate sales.

Additional Inspections

Delaware’s Nursery Program also conducted inspections for APHIS-PPQ, CAPS programs, including 70 pine shoot beetle, 21 chrysanthemum white rust and 13 red imported fire ant inspections.

Boxwood blight, Cylindrocaldium pseudonaviculatum was not detected this year in Delaware. During our statewide retail nursery inspections 49 retail nurseries were inspected for symptoms of boxwood blight.

Sanitary landfill permit conditions do not allow for the disposal of plant material for burial at the landfills. As a result, the Department now makes an official plant material burial request through the Department of Natural Resources, Solid & Hazardous Waste Management Section.

Chrysanthemum white rust (Puccinia horiana) was surveyed for during retail nursery inspections this year and no chrysanthemum white rust was detected. Also during compliance visits there were no Pine shoot beetle (Tomicus piniperda) quarantine violations detected.

Ribes Permitting

Online Ribes Permit: http://dda.delaware.gov/pdfs/Ribes_Permit.pdf

CERTIFICATION OF CURRANT PLANTS
STATES REGULATED: All
MATERIALS REGULATED: Plants of Ribes spp.

RESTRICTIONS: Shipment of regulated materials into and cultivation within Delaware will be allowed, provided a permit authorizing shipment into this area and planting and propagation within the area is obtained from the Plant Industries Section. No permits shall be issued for the plants Ribes aurium or Ribes nigrum.
New Online Nursery License Applications and Inspections System in Fourth Year

Notice New Web Address For Online Nursery Licensing Site:
https://egov.delaware.gov/NILA

Plant Industries is now in the fourth year of using an online system for Nursery Industry License applications. The website allows users to apply, renew, update, and print their Nursery Industry License.

This year the system was prepared for a transition from private industry administration to state administration. The cutover from private to state operations occurred in January of 2015. You will also notice the online license application has a new web address.

Seed Certification and Grain Inspection

The DDA Seed Lab is a member of the Association of Official Seed Certifying Agencies (AOSCA). The lab is responsible for seed certification, grain inspection, and enforcement of the seed law. In 2012, the Seed Lab tested 12 soybean samples for Roundup Ready® tolerance.

Seed Certification Program

The Delaware Seed Certification Program ensures the production of quality seed for planting. The program works to improve field crop varieties, increase the supply and speed the distribution of certified seed. The steps of the certification process are: field inspection and sampling of seed crop, laboratory analysis, and proper labeling of certified seed tags.

<table>
<thead>
<tr>
<th>Activity</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Seed Samples Tested</td>
<td>360</td>
<td>N/A</td>
<td>395</td>
<td>323</td>
<td>232</td>
</tr>
<tr>
<td>Certified Acres Inspected</td>
<td>6,469</td>
<td>8,156</td>
<td>9,589</td>
<td>9,934</td>
<td>8,407</td>
</tr>
<tr>
<td>Certified Seed Tags Issued</td>
<td>104,221</td>
<td>101,282</td>
<td>145,719</td>
<td>109,661</td>
<td>54,722</td>
</tr>
</tbody>
</table>

Grain Inspection Program

The DDA Grain Inspection Unit inspects and certifies every grain mill during the harvest season, and establishes and checks standard operating procedures. The inspection unit also conducts quality tests and resolves grain analysis disputes between growers and the grain mill operator. Most grain harvested is used by the poultry industry.
Grain Inspection Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certified Granaries</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>Grain Inspector License Tests</td>
<td>26</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Granary Inspections</td>
<td>239</td>
<td>150</td>
<td>160</td>
<td>178</td>
</tr>
<tr>
<td>Equipment Tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moisture Meters</td>
<td>116</td>
<td>186</td>
<td>160</td>
<td>180</td>
</tr>
<tr>
<td>Scales</td>
<td>110</td>
<td>110</td>
<td>157</td>
<td>162</td>
</tr>
<tr>
<td>Samples</td>
<td>128</td>
<td>5</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Official Samples</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tested for Certification</td>
<td>300</td>
<td>94</td>
<td>271</td>
<td>193</td>
</tr>
<tr>
<td>Tested for Fungal Diseases</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aflatoxin</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Vomitoxin (DON)</td>
<td>85</td>
<td>38</td>
<td>125</td>
<td>48</td>
</tr>
</tbody>
</table>

Standards Established for the Grading Grain in DE

<table>
<thead>
<tr>
<th>Standards</th>
<th>Wheat</th>
<th>Corn</th>
<th>Sorghum</th>
<th>Barley</th>
<th>Soybeans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damage</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Defects</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dockage</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Foreign Material</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garlicky</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Insect Infested</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Shrunken &amp; Broken Kernels</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Test Weight</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Thins</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Moisture</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Other Standards</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Seed Law Enforcement

Seed lab inspectors conduct sell-by-date inspections at retail and wholesale outlets selling seed to the public. Seed is also purchased for germination testing. If the seed does not meet the standards, a stop-sale is issued and the seed is removed from the shelf. If the violation is corrected then the seed is allowed for sale.

Seed Testing and Inspection

<table>
<thead>
<tr>
<th>Activity</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retail Store Inspections</td>
<td>726</td>
<td>337</td>
<td>419</td>
<td>475</td>
</tr>
<tr>
<td>Seed Testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Official Seed Samples</td>
<td>858</td>
<td>763</td>
<td>646</td>
<td>781</td>
</tr>
<tr>
<td>Service Seed Samples</td>
<td>305</td>
<td>271</td>
<td>455</td>
<td>215</td>
</tr>
<tr>
<td>Roundup Tolerance Samples</td>
<td>8</td>
<td>12</td>
<td>5</td>
<td>15</td>
</tr>
</tbody>
</table>

Plant Regulatory Programs

The Plant Industries Section, in cooperation with the USDA-APHIS-PPQ, seeks to control the establishment and spread of economically injurious plant pests and diseases. The
intercontinental and interstate movement of infected plants and plant products is the major pathway for introduction of nonresident pest species. To regulate the movement of plants, DDA processed the permits in the table below.

### USDA Permits Processed

<table>
<thead>
<tr>
<th>Permit Type and Description</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>USDA-APHIS-PPQ-525 Soil Permit</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>USDA-APHIS-PPQ-526 Move Live Plant Pests</td>
<td>71</td>
<td>72</td>
<td>150</td>
<td>65</td>
<td>80</td>
</tr>
<tr>
<td>USDA-APHIS-PPQ-546 Agreement - Post Entry Quarantine</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>USDA-APHIS-PPQ-588 Plants for Experimental Purposes</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>USDA-APHIS-PPQ-597 Import Permit - Plants &amp; Plant products</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>USDA-APHIS-BRS Biotechnology Permit</td>
<td>27</td>
<td>64</td>
<td>12</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>USDA Permit Lab Inspections</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>State Phytosanitary Certificate</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>State Issued European Corn Borer Compliance Agreements</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>State Issued House Plant Inspection Certificates</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>State Issued Japanese Beetle Greenhouse Certificates</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
MAINE REPORT TO THE EASTERN PLANT BOARD

APRIL 2015 – PORTSMOUTH, NEW HAMPSHIRE

SUMMARY OF 2014 ACTIVITIES

INTRODUCTION

The Division of Animal and Plant Health within the Department of Agriculture, Conservation and Forestry (ACF) includes Maine’s plant regulatory programs, responsible for protecting the state’s plant resources from the introduction and spread of regulated insects and diseases. The Division provides technical information and support to agricultural producers and issues a number of licenses and permits for individuals to conduct certain business. The Division carries out its mission through the work of various programs including: nursery program, integrated pest management program, apiary program, arborist program, cooperative agricultural pest survey (CAPS), seed potato certification and the Board of Pesticides Control. The Division also works closely with the Maine Forest Service, Division of Forest Health and Monitoring which is charged with protecting Maine’s forest, shade and ornamental tree resources from significant insect and disease damage.

NURSERY PROGRAM

LICENSING AND INSPECTION

All businesses or individuals selling nursery stock in Maine must have a license. Nursery stock is defined as: woody plants, including ornamental and fruiting trees, shrubs, vines and all viable parts of these plants; herbaceous plants, including florist stock plants, annuals, perennials, vegetable seedlings, herbs, potted plants and all viable parts of these plants; and any other plant or plant part designated by the commissioner. 1341 nursery stock licenses were issued in 2014. A list of businesses with Maine nursery stock licenses can be found at: www.maine.gov/hort Inspectors performed 1024 inspections at nurseries, greenhouses and plant dealers. A variety of pests were observed during inspections, but most were minor or common pests.

HEMLOCK QUARANTINE CHANGES

Maine’s Hemlock Wooly Adelgid (HWA) Quarantine was amended September 25, 2013. Changes included the removal of logs from the list of regulated articles and the HWA regulated area was expanded to include the entire counties of York, Sagadahoc, and Lincoln counties, and parts of Androscoggin, Cumberland, and Kennebec counties. While, hemlocks shipped into non-quarantined areas still need to be accompanied by either a phytosanitary certificate or a certificate of origin, pre-notification of the shipment is no longer required and statistics are no longer kept on numbers of hemlock trees shipped into the state. More information on Maine’s hemlock woolly
adelgid quarantine and shipping hemlocks to Maine can be found at www.maine.gov/dacf/php/horticulture/importinghemlocks.shtml

**PHYTOSANITARY INSPECTION AND SHIPPING CERTIFICATION**

291 lots of plant materials were inspected and certified for shipment using phytosanitary certificate forms. 6 federal certificates and 7 state certificates were for nursery/forest materials and 278 federal certificates were for potatoes, feed barley and wheat. 25 businesses operated under compliance agreements and were approved to ship nursery stock to other states. 1 business had firewood kilns certified to produce heat-treated firewood for shipment out-of-state.

**PHYTOPHTHORA RAMORUM**

A retail nursery that received *P. ramorum* positive plants in a shipment of rhododendrons in 2012 was surveyed for *P. ramorum* again in 2014. 8 samples were submitted for *P. ramorum* testing and 1 sample was confirmed positive. Nursery program staff will continue to monitor this nursery for *P. ramorum* in 2015.

**INTEGRATED PEST MANAGEMENT PROGRAM**

**GREENHOUSE AND NURSERY IPM**

In 2014, the Integrated Pest Management (IPM) Program collaborated with Cooperative Extension to offer two IPM workshops for greenhouse growers. Approximately thirty five growers participated in the ‘Maine Greenhouse Best Practices' workshop where they learned about new scouting and pest identification tools and participated in hands-on biocontrol learning activities. In addition, approximately 50 greenhouse growers participated in the 'Tri-State IPM Workshop' (held in collaboration with the land-grant universities of Maine, New Hampshire and Vermont) to learn the newest advances in pest identification, prevention and management, gain information about new emerging pests and get the latest research findings.

**SCHOOL IPM**

The Maine School IPM Program continued to support compliance with state pesticide regulations requiring all K-12 schools to utilize IPM methods aimed at minimizing risks of exposure to pests and pesticides. The School IPM Program offered seven workshops, trained more than 110 school staff, and collaborated with federal partners to offer additional training via webinar. The IPM Program also provided one-on-one pest problem solving to public and private schools. In addition, IPM literacy among teachers and youth audiences was supported through teacher workshops and statewide youth education events. In 2014 we trained 50 pre-service teachers at the University of Maine Farmington, conducted a workshop for approximately 50 classroom teachers at the Maine Agriculture in the Classroom Summer Teacher Institute and the Maine School Garden Conference, and engaged over 3,000 young learners and educators at various educational events across the state.

**APIARY PROGRAM**

**REGISTRATION AND INTERSTATE MOVEMENT**

In 2014, 909 resident beekeepers registered 10,517 hives and entry permits were issued for 83,135 hives managed by 35 commercial beekeepers for blueberry, apple and cranberry pollination. The number of registered beekeepers and hives exceeded the "pre-mite era" recorded high of 802 beekeepers and 10,200 hives in 1984. Blueberry growers rented 8,363 additional colonies in 2014 compared with 2013 and the number of hives used for pollination purposes once again set a new
Maine blueberry growers produced 104.4 million pounds of blueberries in 2014. This is the second largest crop, after the 110.6 million pounds produced in 2000, and exceeds the five year average of 89.6 million pounds.

In 2014, 2,300 hives were issued Maine health certificates for interstate movement to FL and GA for wintering purposes. After blueberry pollination, the majority of hives return to their states of origin under certification previously issued by that particular state. In recent years, beekeepers have made far fewer requests for Health Certificates for interstate movement.

**INSPECTION AND DISEASE DETECTION**

Throughout the year 8,200 colonies were surveyed at random with 1,866 opened, inspected and sampled for disease and parasites. Inspections focused on new hobbyist and sideline beekeepers based upon requests and a focus on areas of the state where American foulbrood was found. American foulbrood (*Paenibacillus larvae*) was found in 1.37% of inspected hives nearly double that of 2013. Like 2013, all of the American foulbrood samples sent to the USDA for antibiotic resistance screening were susceptible to both oxy-tetracycline and tylosin. In previous years some samples were found to be resistant to oxy-tetracycline. European foulbrood (*Melissococcus pluton*) and sacbrood virus were detected in 1.57% and 3.0% of the inspected hives respectively. European foulbrood infection was similar to 2013 levels; however, sacbrood virus detections increased more than six fold in comparison to 2013 inspections. Chalkbrood (*Ascosphaera apis*) infection was much lower than that of 2013. South African small hive beetles (*Aethina tumida*) were common in migratory beekeeping operations and honey bee shipments originating from southeastern states. Hive beetles were more prevalent in 2014 than 2013 consistent with recent trends.

In 2014, 77 hives were sampled and the bees microscopically examined for nosema infection. 69% of the samples were positive and 35% of the positive samples exceeded the treatment threshold of 1 million spores/bee. The level of infection was lower than 2013 with the highest spore counts in the 30-40 million spores/bee range.

Nurse bees from 117 hives were sampled for *Varroa destructor* via the alcohol wash method and 63% of sampled hives were positive. Varroa populations increased to damaging levels during late summer/fall in 2014 and viral infections associated with Varroa that afflict both brood and adult honey bees were prevalent in 2014. Viral symptoms were present at relatively low Varroa infestation levels unlike the case in previous years where high Varroa populations initiated viral infection.

Time was spent assessing damage and the quality of the remaining hives salvaged from a load of bees that overturned in DE destined for blueberry pollination in ME. The report was given to the FL beekeeping operation for insurance purposes and the blueberry company that contracted the bees for crop pollination. In 2014, there was an increase in nuisance complaints associated with urban/suburban beekeeping and hives used for blueberry pollination. A stinging incident involving migratory hives that resulted in the death of a dog was reported on blueberry barrens. Like previous years, some of the hives inspected during pollination had extreme defensive behavior. The state apiarist responded to calls from the Maine Turnpike Authority, Maine State Police, local law enforcement and public to exterminate or remove clusters of bees left in blueberry fields and clusters of bees that escape from semis at truck stops, fuel stations and rest areas along I-95.

In April, the US-EPA granted a repeat for the Section 18 Emergency Registration of reformulated HopGuard II (beta acids) to the State of Maine for varroa control. Approximately 2,070 hives were
treated with HopGuard II in 2014 and efficacy was consistent with USDA and BetaTec reports. The reformulated strips are superior to the previous product since the beta acid soaked strips remain toxic to Varroa for a longer period than the first generation of HopGuard. There were no adverse effects observed when treating hives with Hopguard in 2014 as was the case during cold weather treatment in 2012. Beekeepers have been advised to avoid treatment with this pesticide during cold weather when bees are tightly clustered on the HopGuard strips.

**OUTREACH**

In 2014 the state apiarist presented 30 lectures and workshops on a variety of beekeeping topics to blueberry growers, farm and horticulture associations, civic groups, educators, beekeeping associations, and at beekeeping short courses offered by County Extension and Adult Education programs. He coordinated and co-instructed an eight week course on beekeeping at the Maine Academy of Natural Sciences, a charter school. In 2014, interviews were conducted with Maine Public Radio and various Maine newspapers. The state apiarist participated in 3 conference calls. Two calls with the US-EPA Pollination Protection Workgroup, Pesticide Program Dialog Committee as a member of the Best Management Practices sub-committee and one call with the NASDA Pollinator Workgroup.

The state apiarist also made recommendations to town code enforcement and the public regarding nuisance situations involving bees and wasps in urban and suburban settings.

**MISCELLANEOUS**

LD 1587- An Act to Temporarily Ban the Use of Neonicotinoid Pesticides was withdrawn by the sponsor due to overwhelming opposition.

The state apiarist investigated four reports of bee kill associated with pesticide application. Three situations involved agricultural applications (apple, blueberry, and broccoli) and one concerned DOT roadside herbicide application. In all cases, the impact on the hives was minimal.

**COOPERATIVE AGRICULTURAL PEST SURVEY (CAPS)**

The Division administered the Cooperative Agricultural Pest Survey (CAPS) Program, a cooperative effort between the USDA APHIS PPQ, state departments of agriculture and state universities. CAPS provides an early warning system for pest detection and response that is critical for safeguarding our nation’s agricultural and natural resources. The CAPS program supports the position of the state survey coordinator (SSC).

The Maine CAPS Program allowed for survey work of the following in 2014:

- **Corn Commodity Survey**: conducted by the Division and the University of Maine Cooperative Extension. Traps were deployed for old world bollworm (*Helicoverpa armigera*), Asian corn borer (*Ostrinia furnacalis*), cotton cutworm (*Spodoptera litura*), Egyptian cottonworm (*Spodoptera littoralis*), and false coding moth (*Thaumatotibia leucotreta*). The Division deployed traps for all target species at 14 farms in 6 counties; The University Cooperative Extension deployed traps for 3 target species at 6 farms in 5 counties. None of the target species were found.

- **Small Grains Pest Survey**: conducted by the Division. Thirteen soil samples were collected from fields of wheat and barley according to protocol for the following nematodes; cereal
cyst nematode (*Heterodera filipjevi*) Mediterranean cereal cyst nematode (*Heterodera latipons*), and British root-knot nematode (*Meloidogyne artiella*). Samples were sent to the Maryland Department of Agriculture Nematology Lab for diagnostics. None of the target species were found. Wheat fields were also inspected for dwarf bunt (*Tilletia controversa*), karnal bunt (*Tilletia indica*), and flag smut (*Urocystis agropyri*).

- **Exotic Woodborer and Bark Beetle Survey;** conducted by the Maine Forest Service. Surveys were conducted for the following targets: Japanese pine sawyer (*Monochamus alternatus*) – trapping at 8 sites in 5 counties, spruce bark beetle (*Ips typographus*) – trapping at 8 sites in 1 county; Asian longhorned beetle (*Anoplophora glabripennis*) – visual survey of 440 host trees at 9 locations in 6 counties; emerald ash borer (*Agrilus planipennis*), and oak feeding buprestids (*Agrilus biguttatus, A. auroguttatus*) – Cerceris surveillance at 35 sites with ash and oak trees; 370 buprestids collected over 7-week period. None of the target species were found.

Data was entered into NAPIS for 23 pests. There was one new state pest find (red pine scale, *Matsucoccus matsumurae*) entered into NAPIS.

In addition, several other surveys were administered through the CAPS program including:

- Potato Cyst Nematode (PCN) National Survey,
- Forest Pest Outreach and Survey Project (FPOSP)

**FOREST PEST OUTREACH AND SURVEY PROJECT (FPOSP)**
The CAPS SSC coordinated the Forest Pest Outreach and Survey Project (FPOSP) for the sixth year in a row. This project has grown to include over 20 states in an effort to build an awareness program aimed at early detection of Asian longhorned beetle (ALB), emerald ash borer (EAB), and other invasive forest pests. A part-time coordinator was hired to manage the volunteer program. A large number of state and federal agencies cooperated on this project, including: The Nature Conservancy, USDA APHIS PPQ, USDA NRCS, Bureau of Parks and Lands, local K-12 school districts, Master Gardeners, various soil and water conservation districts, and others. For 2014, 129 new volunteers were trained in five formal train-the-trainer workshops around the state, bringing the total to 406 volunteers to help conduct outreach and survey on ALB, EAB, brown spruce longhorn beetle (BSLB) and other recent tree invasives, such as hemlock woolly adelgid (HWA) and winter moth. Over 100 events were conducted and approximately 60,000 people reached.

No ALB, EAB or BSLB have been found in Maine, although HWA is expanding its range, and the recent establishment of winter moth has caused noticeable defoliation in certain areas of the state. This project is continuing throughout the summer of 2015, and a farm bill suggestion was submitted to extend the project another year.

**NATIONAL EMERALD ASH BORER TRAPPING SURVEY**
Three agencies participated in a national trapping survey for the emerald ash borer; Maine Department of Agriculture, Conservation and Forestry, USDA APHIS PPQ, and the Penobscot Indian Nation. Approximately 800 purple traps were deployed at predetermined locations throughout the state. The National EAB Survey Protocol was followed. No EAB was collected from any of the traps. A similar survey is being conducted in 2015.

Data was entered into IPHIS for National EAB Survey.
Seed potatoes are certified to control the level of pests in Maine’s potato industry. Certification is a three-step process: inspection of seed potatoes during the summer, post-harvest disease evaluation of samples submitted for testing and inspection during shipping to ensure the potatoes meet grade standards. Only lots that have been found to meet, field, post-harvest testing and shipping point inspection can be tagged as certified seed.

SUMMER FIELD INSPECTION
In 2014, 10,861 acres met disease tolerances for regulated diseases and pests during the summer field inspection program. A directory of producers whose seed lots passed the summer inspection program is compiled at the conclusion of the field inspection season and posted at www.maine.gov/dacf/php/seed_potato.

POST-HARVEST TESTING
Maine statutes require a sample be submitted for post-harvest disease evaluation at a state operated farm in Homestead, Florida in order for a seed lot to receive certification. In November 2014, 1001 samples, representing approximately 10,695 acres of potatoes were planted, and then evaluated for disease in January 2015. 57% met the certification requirements for foundation seed (total virus <0.55%), 37.8% met the requirements of certified seed (total virus 0.56-5%) and 5.2% did not meet the seed certification standards (>5% total virus). Florida test results are posted at www.maine.gov/dacf/php/seed_potato.

POTATO CYST NEMATODE NATIONAL SURVEY
The Seed Potato Certification Program participated in the Potato Cyst Nematode (PCN) National Survey for the fifth year in a row. Funding for the 2014 survey came from the Farm Bill. No seed potatoes could be shipped out of Maine unless they came from fields that have been sampled and tested for PCN (Globodera pallida) and Golden nematode (GN) (Globodera rostochiensis). Division staff used specialized mechanical samplers to survey all seed potato fields in Aroostook County that grow seed for export. Each acre was sampled according to protocol to collect a 5 lb sample, resulting in 4130 samples. All soil samples were shipped to the USDA APHIS Nematode Laboratory in Avoca, NY. No PCN or GN was found.

Data was entered into IPHIS for PCN.

BOARD OF PESTICIDES CONTROL

PESTICIDE USE AND APPLICATOR LICENSING
The Board of Pesticides Control (BPC) licenses pesticide applicators (Agricultural Basic, Private and Commercial) and pesticide dealers (limited/restricted and general use products). As of March 2015, there are 174 active Agricultural basic licensees, 1117 active private licensees, 1733 active commercial licensees, 249 spray contracting firm (business) licenses, 63 limited/restricted use dealers, and 943 general use dealers.

LEGISLATION
The Legislative and public policy arena included a few changes during 2014, the BPC continued to offer training, exams and licensing for fruit, vegetable and grain growers who only apply general use pesticides and annually sell at least $1000 worth of produce. The new license is called: "Agricultural Basic” and it will be required of these growers by April 1, of 2015. The statute was in
2011, with rules promulgated in 2012. Currently BPC has 174 growers licensed as Agricultural Basic Applicators.

Additionally, the Board and Department of Agriculture, Conservation and Forestry in cooperation with the Maine Centers for Disease Control (CDC) submitted legislation to develop a better framework and plan for responding to the threat of West Nile Virus and Eastern Equine Encephalitis (EEE) to humans and animals.

The Legislature passed a law which clarifies the roles of the State and municipalities in the event of a mosquito-borne disease emergency and codified the plans developed by the Maine Forest Service and Maine CDC.

The Legislature also passed laws that allowed medical marijuana growers to use a broader spectrum of pesticides including Section 3 registered products that are labeled for use on “all plants”. Two bills failed, one to ban neonicotinoids and another to ban methoprene and resmethrin for mosquito control.

**ARBORIST PROGRAM**

All individuals performing arborist work in Maine must have a license. According to Maine Arborist Licensing Law (7MRSA Section 2173-2191) an arborist is anyone who, for compensation, takes down or fells, diagnoses or evaluates, recommends or supervises treatment, or in any manner or for any purpose treats or cares for shade or ornamental trees. In order to become a Maine licensed arborist, individuals must pass an exam demonstrating proficiency in arborist techniques, safe use of arborist tools and equipment, tree identification and pest identification. Licenses and exams are offered in two categories, landscape and utility. In 2014 a total of 968 arborist licenses were issued by the Division.

**FOREST INSECT AND DISEASE CONDITIONS**

*Courtesy of the Forest Health & Monitoring Division, Maine Forest Service (MFS). Growing season condition reports are available on the MFS website www.maine.gov/dacf/mfs/publications/condition_reports.html*

**RED PINE SCALE**

Red pine scale (*Matsucoccus matsumurae*), also known as Japanese pine blast scale was detected in Mount Desert, Hancock County, Maine in September. The original sample was submitted to the MFS Lab by a gardener who had observed die-off in a red pine stand in Mount Desert and noted the intermixed pitch pine were unaffected. In a follow up visit to Northeast Harbor the scale was readily detected on red pine.

Red pine scale is native to Japan and was first detected in the United States in 1946 in Easton, CT. It is considered a serious pest in its introduced range in China, Korea Europe and the United States. Where it is found in the US, it is one of the most significant pests of red pine, but it does not affect other pine species native to Maine.

Little is yet known about red pine scale occurrence in Maine. It appears the insect is well established in the area around Northeast Harbor in Mount Desert and has contributed to significant
red pine mortality there. MFS staff have responded to concerns regarding red pine decline and mortality in that area for a number of years. This is the first time the insect has been encountered on submitted or gathered samples and in field visits. However, it is not likely that this is a new introduction. It is possible the insect is established elsewhere in Maine, especially in warm, coastal regions.

Significant disease symptoms have also been observed in red pine in Mount Desert and throughout Maine. Principal agents are two shoot blights, Sirococcus conigenus and Diplodia pinea. These do not have the same climatic limitations to their distribution that red pine scale appears to have, and are found in hosts from the coast, northward. They are favored by wet conditions in spring and early summer and are of increasing concern in the state.

More information on red pine scale can be found at: www.maine.gov/forestpests#rps

More information on Sirococcus shoot blight can be found at: www.maine.gov/dacf/mfs/forest_health/diseases/sirococcus_shoot_blight.htm

ELONGATE HEMLOCK SCALE

Elongate hemlock scale (Fiorinia externa) was reported at three new sites by a landscape professional in southern Maine this summer, in the towns of Ogunquit, Kennebunkport and Wells (York County). In some cases it is obvious the infestations originated from infested planted trees. In others, it is not clear whether the infestation is part of an expansion of the distribution of this insect through natural spread. To date, we have only confirmed forest infestations of elongate hemlock scale in Kittery. However, this is a very cryptic insect. In Ogunquit the insect was seen on balsam fir, hemlock, concolor fir and blue spruce. This is the first time the pest has been noted on species other than Abies and Tsuga in Maine, although in the literature it is reported on a wide range of conifer hosts.

SPRUCE BUDWORM

The spruce budworm (Choristoneura fumiferana) outbreak in Quebec continues to expand and Maine has ramped up monitoring efforts in the State. Field staff have been on the lookout for signs of spruce budworm feeding, light traps catches are checked for budworm and aerial surveys monitor remote regions. But the largest increase in monitoring has come in pheromone trap use. Eighteen landowners/managers across the northern half of the state plus MFS personnel and Public Land managers have set traps in almost all of the 400 northern townships. Pheromone traps have a lure based on the female spruce budworm moth scent that draws the male moths to the trap. It is a very sensitive method of trapping insects and the MFS has been doing it since the early 1990’s in 60-85 locations. The trap catches look as was expected; catches are on the rise but not exponentially so. Where there were traps in the past they are averaging twice what was caught last year. New traps are providing a baseline for future years. We will continue to closely monitor this native pest of spruce/fir forests.

CALICIOPSIS PINEA SURVEY

Caliciopsis pinea has been previously thought to be a secondary pathogen of white pine primarily in overstocked stands, and in young, pole-sized stands on intermediate or poor sites. The cankers are usually fairly superficial, and may be calloused over within a year or two if tree growth conditions improve. The cankers can result in grade losses to wood products.
While the disease has been known to occasionally occur in Maine stands, Caliciopsis canker has been recognized as causing some significant stand damage in New Hampshire over the past several years. Concern that the disease may be increasing in occurrence and intensity has led to a cooperative survey project with the USDA Forest Service, Maine Forest Service, and New Hampshire Department of Resources and Economic Development, Division of Forests and Lands. A survey for the occurrence and level of damage resulting from Caliciopsis canker in regional white pine stands was initiated this summer, and will continue for the next two years. To date in Maine, twenty randomly selected stands have been surveyed, with Caliciopsis pinea identified on white pine regeneration from 16 stands surveyed. Caliciopsis symptoms in overstory trees were also identified in 16 stands, but not always from those with infected white pine regeneration. Relationships between tree stress resulting from the white pine needle disease complex, and the incidence and severity of Caliciopsis canker have not been established, but may become apparent as studies continue.
MARYLAND
Annual Report to the Eastern Plant Board
Portsmouth, NH - April 2015
Summary of 2014 Activities

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Submitted by,

Carol Holko
Assistant Secretary, Plant Industries and Pest Management
**APIARY INSPECTION**

MDA’s Apiary Inspection Program controls honey bee diseases, parasitic mites, and other pests, to maintain healthy colonies for the pollination of Maryland crops. Honey bees pollinate crops valued at more than $40 million. Maryland fruit and vegetable growers rent 5,000 colonies a year to improve pollination. Beekeepers’ colonies are essential to Maryland because two parasitic mites have nearly eliminated feral bee colonies.

**American foulbrood** is the most serious brood disease of honey bees and can destroy a colony in one year. The 13 colonies that inspectors found to have American foulbrood, as diagnosed by the USDA Bee Laboratory in Beltsville, MD, were destroyed to control the spread of this bacterial disease to healthy colonies. The incidence of disease remains relatively low – 0.2% of the colonies inspected.

**Varroa mite** (*Varroa destructor*) populations were very high in Maryland in 2014, and brood problems were attributed to varroa mite. The varroa mite has been found to be resistant to Apistan®, the primary product used to control this parasite. There are six products available to control varroa mite. One of the serious problems caused by Varroa is the transmission to honey bees of viruses which cause deadly diseases. Nearly twenty honey bee viruses have been discovered and the majority have an association with Varroa mites. Therefore controlling Varroa populations in a hive will often control the associated viruses and symptoms of the viral diseases.

**Tracheal mite** (*Acarapis woodi*) populations, as documented by the USDA honey bee laboratory, continue to be so low that tracheal mite is no longer considered a threat to honey bees if colonies are monitored on a regular basis.

**Africanized honey bees** (AHB) arrive occasionally on cargo ships coming from South or Central America. Swarm traps for collecting and monitoring bees were placed at 35 sites at marine terminals and other shipping locations. No swarms were collected in 2013. MDA is working with two groups – the Mid-Atlantic Apiculture Research and Extension Consortium (MAAREC) to provide information to the general public about emergency incidents, and the Apiary Inspectors of America (AIA) for information on the control of AHB movement, other than through natural spread.

**The small hive beetle** was detected in packaged bees and reported or detected in all 23 counties this past year. Colonies are treated and monitored to ensure successful control of the beetles. There have been reports of larval damage to established colonies. The small hive beetle is a pest mainly in stored equipment and in honey houses, although it can render stored honey in the hive unmarketable.

**Permits** were issued for 3,684 honey bee colonies to move into Maryland, primarily for overwintering, and 2,500 colonies to move out of Maryland for pollination services. For the seventh year, Maryland beekeepers sent colonies to California for almond pollination. In the winter of 2014, 1,520 colonies were again transported to California for this purpose.

**NURSERY INSPECTION and PLANT QUARANTINE**

The nursery and greenhouse industry continues to be a leading part of Maryland’s agricultural economy, currently ranking second among commodities, with a total of approximately $960 million in farm income. Other horticultural products and services boosted total gross receipts to more than $1.96 billion. A primary goal of state plant protection and quarantine efforts is to facilitate the production, sale, and distribution of Maryland nursery stock. This is accomplished in large part by inspection and certification activities conducted on-site by Plant Protection & Weed Management staff. Maryland law
and reciprocal agreements with other states require annual production facility and sales location licensing for all producers and suppliers of nursery stock in the state. Production nurseries are inspected annually to ensure that plant material is free of dangerously injurious plant pests. Additionally, plant dealers are inspected regularly to insure plant materials are received and maintained in a healthy and pest-free condition for wholesale and retail sale.

In 2014, the Maryland Nursery Inspection Program licensed 309 nurseries, 1,342 plant dealers and 7 plant brokers. In 2014, 9,263 acres of nursery stock and nearly 10,000,000 square feet of greenhouse production were certified. In 2014, Plant Protection & Weed Management staff performed routine inspections at 411 Maryland locations. The general health of Maryland-produced nursery stock was found to be excellent. In additional certification activities for 2014, 151 state phytosanitary certificates that assure compliance with established domestic quarantines were issued to 12 states and U.S. Territories. In 2014, 315 federal phytosanitary certificates, required to export Maryland nursery stock from the U.S., were issued to 39 foreign countries.

Specific events of note: In 2014 Nursery Inspection Program staff continued to perform follow-up inspections on trace-forward mail-order plant material for possible Phytophthora ramorum contamination. No infected plants were detected. Staff also assisted with cooperative agricultural pest survey (CAPS) for P. ramorum in nurseries.

Of the two Maryland Eastern Shore nurseries where stop sale orders were issued in 2013 for plant material infected with boxwood blight, Calonectria pseudonaviculata, and after repeated attempts to selectively eradicate infected material, one nursery destroyed all host material in 2014 and the other nursery is in the process of doing so in early 2015. Additionally in 2014, a nursery where boxwood blight was first found in 2012 and where the disease had apparently been eradicated, was again found to be positive for the disease in 2014. Standard eradication protocols and best management practices were again conducted at the nursery with Nursery Inspection Program staff direction. For the first time in 2014, boxwood blight began to show up in a few home landscape sites in the state, with the apparent source of infection being contaminated nursery stock installed on those properties.

Nursery Inspection Program staff worked with landowners and lumber mills to ensure that interstate movement of walnut timber was only allowed from areas in Maryland not found by survey to be infested with walnut twig beetle, Pityophthorus juglandis and thousand canker disease, Geosmithia morbida. Plant Protection & Weed Management staff continued to pursue further cooperative and compliance agreement opportunities and followed revised protocols that have streamlined and improved the preparation of Maryland nursery stock for sale which was distributed to both foreign and domestic markets.

PEST SURVEY
The Cooperative Agricultural Pest Survey (CAPS) and Farm Bill surveys are joint projects between the MDA and USDA’s Animal and Plant Health Inspection Service (APHIS) and USDA Plant Protection and Quarantine (PPQ). The USDA recommends specific pests of quarantine export significance as survey priorities and provides funding for these surveys. These cooperative survey programs provide necessary data used to certify Maryland products for export to many countries. The surveys also allow for continued outreach and education.

CAPS and Farm Bill surveys document the presence or absence of exotic pests in Maryland, support PPQ exotic pest survey activities and provide state-specific data for exotic pests in the United States. Early detection of exotic pests before they become established aids in eradication or control efforts, and protects Maryland agriculture, nursery stock and the environment from potential devastating losses.
Federally funded CAPS surveys include: exotic wood borers, cyst nematode, khapra beetle (*Trogoderma granarium*) /noxious weeds, imported fire ant and emerald ash borer; the farm bill surveys include: nursery (*P. ramorum* and exotic moth), stone fruit and tomato.

In 2014, MDA deployed and monitored 2,142 insect traps and, from these various traps, collected 2,155 samples. Survey and trapping techniques vary depending on the pest being surveyed for. Some trapping devices include purple prism traps, bucket traps, delta traps and Lindgren funnel traps. All traps include an attractant; lure, food bait and host volatiles are some examples. There were eight extensive surveys targeting 40 exotic pests that impact trees, store products, field, orchard commodities and nursery stock.

**CAPS SURVEYS**

**Red Imported Fire Ant** - The red imported fire ant (IFA), *Solenopsis invicta*, a stinging insect native to South America, is occasionally shipped out of its regulated area in the southern United States. Despite its quarantine, which requires a wide variety of commodities to be treated or certified free of fire ants before being transported, some nursery stock has made its way to MD infested with fire ants. The yearly fire ant survey focuses on tropical plants arriving from the southern US. In 2014 ninety-seven sites were surveyed and five were confirmed positive for IFA. Four of the positive sites were retail establishments and one was a licensed nursery. All five sites were issued eradication treatment orders under an MDA Treatment Order and all have completed the treatments.

**Emerald Ash Borer** - The emerald ash borer (EAB), *Agrilus planipennis*, has been in Maryland since 2003. Presently EAB is located in twelve counties on Maryland’s western shore and Baltimore City. In 2014 Carroll county and Baltimore City were added to that list. The 2014 survey consisted of 304 purple prism trap sites, 26 of these sites were found positive. An additional trap trial survey was conducted for USDA, consisting of 10 sites with 4 traps each, testing different lure and trap combinations throughout the infested part of Maryland. Presently Maryland’s Eastern Shore is still negative and not under a state or federal quarantine. All counties west of the Chesapeake Bay and the Susquehanna River are under both state and federal quarantines. MDA, along with USDA APHIS PPQ, participates in parasitoid releases. Presently, there are 3 parasitoids approved for release and MDA has released all of these since 2009. In 2014, 59,218 parasitoids were released at eight biocontrol sites in six counties. All three introduced parasitoids have been recovered in Maryland. MDA also raises tropical ash (*Fraxinus uhdei*) to assist in the parasitoid production.

**Cyst Nematodes** - The cyst nematodes surveyed for can be found throughout the world and some are found here in the US. These nematodes have been found to cause severe agricultural damage to many of the crops we grow in Maryland. Three counties (Calvert, Charles and St. Mary’s) were surveyed for 10 exotic cyst nematodes. There were nine sites surveyed per county. All sites were crop fields recently planted in corn or soybeans. All samples were negative.

**Exotic Wood Boring Beetles** - USDA regulation require all wood packing material to be treated, so that any insect living in the wood would be killed, however some packing material is not properly treated, causing possible exotic wood borers to be shipped to the US and thus be introduced to our environment. Bark beetles can be extremely destructive and in parts of the world have been known to destroy large acreages of forest. In 2014, there were eleven sites surveyed for exotic wood boring bark beetles and all of the sites receive goods that are packed with wood dunnage. This survey ran from mid-March - October. Each site had three Lindgren funnel traps, each trap has a specific lure which is used as an attractant to one or more of the exotic beetles being surveyed for. All samples were negative. Two of the sites surveyed for EWBB pests, also house a blacklight trap. The blacklight trap is used for...
longhorned beetle detection, these two traps did not detect any of the high priority pests that were surveyed for.

**Khapra Beetle / Noxious Weeds** - The khapra beetle, *Trogoderma granarium*, is an exotic insect pest that feeds on seeds and stored grain products. It is known as one of the world’s most destructive insect pests. The MDA surveys a large warehouse that receives seed from countries known to have established populations of the khapra Beetle. There are ten traps throughout the warehouse facility from early spring into late fall. There have been no detections of the khapra beetle at this facility.

**FARM BILL**

**Tomato Survey** - In 2014, there were 5 exotic pests being surveyed for in tomato fields in Maryland. All of these pests have been known to cause extreme destruction in tomatoes in other parts of the world. One of the pests, *Tuta absoluta*, is known to be in the Caribbean and due to its close proximity to the US, is of high priority for survey. Six sites on Maryland’s Eastern Shore and in southern Maryland were surveyed from June-September. 173 samples were collected and all samples were negative for the targets.

**Stone Fruit** - There were seven sites randomly chosen for the stone fruit survey in Maryland. The survey sites were located throughout the state. There were seven targets surveyed for at each site. Traps were hung in stone fruit trees, 385 samples were collected and all samples were negative. If any of these targets were to become established in the US, there would be large losses to the stone fruit industry.

**Nursery Survey** - This survey was split into two parts. An exotic moth species survey was conducted at eight sites in six counties throughout the state, also a *P. ramorum* survey was conducted at several nurseries in Maryland. The moth survey included three high priority pests and one pest of state concern, *Duponchelia fovealis* (European pepper moth). While none of the high priority pests were detected, the European pepper moth was found in five counties, all official county records. There were 255 samples collected during the moth survey which focused on greenhouse growers receiving large numbers of annual plants.

**DIAGNOSTIC LABORATORIES**

The Plant Protection and Weed Management Section laboratories provide testing, analyses and identifications to support MDA programs as well as providing answers to inquiries from outside the department.

**Entomology Laboratory**: Along with the normal predictable nursery, garden, and household pests, and common creatures submitted in 2014, a number of more interesting specimens were seen. Among them were a hickory horned devil (*Citheronia regalis*) caterpillar which can reach 5” in length, an uncommon large red and black assassin bug (*Microtomus purcis*)- photo only, and the spectacular giant ichneumonid wasp, (*Megarhyssa atrata atrata*), which is 5-6” long, including its ovipositor. Several specimens of lawn bagworm (*Astata confederata*) were submitted by HGIC from western Maryland. In mid-May, over 3-4 days, emergences of large numbers of a predatory carabid beetle, (*Calosoma wilcoxi*) were recorded in parts of Maryland and Virginia. An Eastern worm snake, (*Carphophis amoenum amoenum*), 5” long, frightened a homeowner who was assured it was harmless. Viburnum leaf beetle [*Pyrhralta viburni*] eggs and damage were detected on several native viburnums by a landowner in Western Maryland in November, 2014. This is a first detection. Other samples included two plants, Italian bugloss (*Anchusa azurea*), displaying brilliant blue flowers, parachute plant (*Ceropegia sandersonii*) which has unique flowers, and a disease, oxalis rust (*Puccinia oxalidis*) found on a greenhouse wood sorrel (*Oxalis triangularis*).
**Plant Pathology Laboratory:** The Plant Protection and Weed Management plant pathology laboratory provides testing, analysis, and recommendation services for problems caused by biotic pathogens such as fungi, bacteria, viruses, and nematodes, as well as abiotic, such as soil and environmental related problems, to support MDA programs. It also provides answers to inquiries from outside the department. MDA’s plant disease specialist continued relocation, refitting, and updating of equipment in the laboratory. Collection, maintenance, and calibration of equipment plus updating and improving the lab’s molecular capabilities are continuing.

The pathology laboratory received more than 125 samples for diagnosis and management solutions during the 2014 growing season. A majority of the samples came from nursery inspectors, some from pesticide inspectors, landscapers, and home owners. About 15% of samples received were abiotic-related, such as watering issues, soil management, cold damage, etc., while the other samples were caused by biotic pathogens, such as fungi, bacteria, viruses and nematodes. The majority of samples received were caused by fungal pathogens. Management strategies based on an integrated pest management approach were recommended for these problems.

The exotic disease, boxwood blight, *Cylindrocladium buxicola* (syn. *Calonectria pseudonaviculatum*) remained a high priority problem. Several samples were received to confirm absence of *C. buxicola* fungi from a boxwood nursery and plantation. The plant disease specialist also visited nurseries to investigate the disease in the field and took extensive samples. Complete destruction of boxwood plants was recommended to a nursery because of continued presence of the pathogen and a potential danger of spreading it by human activities. The presence of *Geosmithia morbida*, the fungus causing thousand canker disease, which is associated with walnut twig beetle, found in one site in Maryland in 2013, was confirmed in the state and disease management strategies have been recommended.

In 2014, PPWM obtained funding and completed a survey for *Phytopthora ramorum*. The survey covered nurseries, garden centers, and landscape sites. Staff visited 12 nurseries and garden centers receiving plant material from Oregon, California, and Canada and inspected 115, 327 Azalea, Camellia, *Kalmia*, *Pieris*, *Rhododendron*, and *Viburnum* plants. Five hundred eighty seven symptomatic samples of different plant species were collected and tested for *Phytopthora* spp. by ELISA kit. Of these, 26 samples were found positive for *Phytopthora* spp. and submitted to the Cornell University Diagnostic Clinic for *P. ramorum* confirmation. All 26 samples tested negative for *P. ramorum*. Staff made trace forward visits to eight homeowner properties, inspected 68 plants, and collected 22 suspect/symptomatic samples to test for *P. ramorum*. They were tested for *Phytopthora* spp. by ELISA kit, and none were positive for the fungus.

Soil samples from 27 soybean fields were processed and examined for soybean cyst nematode (*Heterodera glycines*); all fields were found free from soybean cyst nematode. Close to 200 asymptomatic trace forward sample of *Osteospermum, Impatiens Tamarinda*, and *Calibrachoa* were received and tested for *Ralstonia solanacearum* race 3 biovar 2, a select agent. About 36 pooled samples were found positive for *R. solanacearum* by Agdias ELISA kit. These samples were submitted to a USDA- PPQ laboratory. The laboratory confirmed the absence of *R. solanacearum* race 3 biovar 2.

**Greenhouse Laboratory:** Mile-a-minute (MAM) weed plants (*Persicaria perfoliata*) were produced for the integrated pest management and biological control program for insect colonies that require food and plant material for research. 1,700 MAM stem cuttings were taken and 1,370 plants were transplanted and grown in the greenhouse until ready to be used as food for colonies of the stem boring weevil, *Rhinoncomimus latipes*.

Four hundred twenty five tropical ash, *Fraxinus uhdei*, continue to be grown and maintained in the greenhouse in support of the EAB biological control program. Two dozen leaves a week are used here at
the MDA headquarters rearing facility. These trees are also used to support the EAB Rearing Facility in Michigan, where 200 leaves a week are sent to feed parasites used for the biological control effort against EAB. To support the continued healthy growth of these plants, biological controls are released on a regular basis to control outbreaks of various greenhouse pests. The thrips predator *Neoseiulus cucumeris* and the spider mite predators *Mesoseiulus longipes* and *N. californicus* are used throughout the year.

Virus testing on five varieties of strawberry (*Fragaria*) is being conducted, and strawberry plants, to support the testing, are maintained throughout the year.

A variety of support programs takes place at the greenhouse on a yearly basis. These include plants produced to support the MDA displays at the Maryland Flower and Garden Show as well as the Maryland State Fair.

**PLANT CERTIFICATION**

The Maryland Ginseng Management Program protects American ginseng, *Panax quinquefolius*, by monitoring the harvest and by licensing diggers and dealers of wild, wild-simulated, woods-grown and cultivated ginseng. MDA conducts a management program in cooperation with the U.S. Fish and Wildlife Service (FWS) that follows established protocols and Convention on the International Trade in Endangered Species (CITES) regulations to ensure the continued viability of this potentially threatened native resource and to protect it from over-harvest. Harvested ginseng is certified through this program to enable licensed dealers to sell this wild-harvested plant product in international markets. MDA also works with growers of wild-simulated and woods-grown ginseng to allow them to market and export their highly valued crops. The dried roots are highly prized, especially in China and Korea, for properties that putatively promote good health. High quality native ginseng root continues to be in great demand on the international market, and prices for wild American ginseng continue to increase. In 2013, at times, prices surpassed the $1,000 per pound mark. During the 2013-2014 season, the program licensed 19 ginseng dealers and 186 ginseng collectors in the state.

Over the 2013-2014 harvest and sales season, the certification program inspected, collected size and age data from, weighed, and certified 124.06 pounds of dry wild ginseng root, 6.0 pounds of green (fresh) wild ginseng root, 125.25 pounds of artificially propagated dry ginseng root and 112.25 pounds of artificially propagated green ginseng root. (For the purposes of this report, wild-simulated ginseng has been classified as artificially propagated.) The wild harvest and certification numbers are about 20% less than the numbers for dry wild ginseng and 46% less than those for artificially propagated dry ginseng as compared to 2012-2013. However, the amount of green ginseng root certified in the 2013-2014 season represents a greater than four-fold increase over that recorded for 2012-2013. This may represent an increasing demand for the domestic use of fresh ginseng in the U.S. market, and a new type of ginseng buyer licensing with a state ginseng dealer’s license. When root is sold in a green (fresh) condition, it generally weighs about 3x the weight of the same root when dried. If this is taken into consideration, the overall harvest of ginseng in Maryland in 2013-2014 was about 23% higher than in 2012-2013. As is generally the case, fluctuations in the amount of Maryland ginseng certified and sold, likely reflects the demand and pricing on the international market, and does not necessarily reflect the status or abundance of wild American ginseng in Maryland. Harvest and sales data were gathered and reports were submitted in accordance with U.S. Fish and Wildlife Service and CITES requirements.

The amount of ginseng cultivated, including woods-grown and wild-simulated designations in Maryland, and certified by the department continues to keep pace with the amount of wild ginseng harvested and certified in the state. This reflects both continuing interest in ginseng as an alternative crop, and the ability of Maryland growers to produce high quality ginseng. There were many calls to the Ginseng
Management Program coordinator this year, inquiring not only about the new ginseng regulations, but also how to grow ginseng on one’s own property. With an increased interest in and production of American ginseng in Maryland as an alternative agricultural crop, harvest pressure on wild ginseng may be reduced, in turn, allowing wild ginseng populations in Maryland to rebound.

Annual questionnaires mailed to ginseng collectors and dealers at time of licensing were modified in 2014 to gather information on program participant’s concerns relative to the new moratorium placed by the Maryland Department of Natural Resources on ginseng harvest on all state managed property, including State forests and wildlife management areas. Many of the respondents continue to express concern that the incidence of out-of-season poaching of wild ginseng in Maryland remains high. There was also concern expressed about the lack of regulatory enforcement relative to ginseng harvest in general, and an overall sentiment that preventing of legally licensed collectors from harvesting on state managed land would actually promote poaching as there will be fewer legal harvesters active to report illegal activity. Most participants in the Maryland Ginseng Management Program view themselves as stewards and protectors of a natural heritage.

In 2014, MDA continued to evaluate harvest trends and watch for positive developments resulting from a regulation change made July 1, 2010. As of that date, the harvest season for wild American ginseng in Maryland was changed from 20 August-15 December to 1 September 1-15 December. This change effectively gives the ginseng fruit longer to ripen, on average, and insures a higher percentage viability of seed. This will allow wild ginseng populations a better opportunity for recovery from harvest pressures. It remains to be seen if these changes have affected any population increase in the field. It is expected that any change will be gradual, and that detection of positive trends may not happen for several years. This revision also complies with harvest season modifications highly recommended by the U.S. Fish and Wildlife Service to not only bring all states with wild American ginseng populations into harmony in terms of parallel harvest season dates, but is also based on long term research that indicates the change is necessary to insure long term survival of wild American ginseng in its native range. To date, neighboring states of West Virginia, Virginia and Pennsylvania have made the recommended changes to their harvest season.

**WEED INTEGRATED PEST MANAGEMENT (IPM)**

Plant Protection and Weed Management Section entomologists and staff continued to work with the Maryland Department of Transportation, State Highway Administration (SHA) to conduct an IPM program to provide biological control for certain targeted weed species on SHA right of ways. Weed IPM research activities were continued on State Highway Administration (SHA) right of ways, using funding from SHA and USDA APHIS. MDA weed management and biological control research projects have been conducted over each of the past 17 years, and have involved cooperation with the Maryland State Highway Administration, the Howard County Department of Recreation and Parks, the Maryland National Capitol Park and Planning Commission, the Maryland Department of Natural Resources, the U.S. Department of Agriculture (both ARS and APHIS), the U.S. Forest Service, and private citizens. Integrated pest management investigations now target the suppression of mile-a-minute weed, *Persicaria perfoliata*, through use of biological control. MDA personnel rear, release and monitor biological control agents for this problematic weed species.

Purple loosestrife, *Lythrum salicaria*, a target of earlier biological control work by MDA, continues to be monitored by MDA Plant Protection and Weed Management program staff. Over the past 17 years, research has focused on one or more of the following: the evaluation of organisms for potential biocontrol of thistles, purple loosestrife, and mile-a-minute weed, testing herbicide formulation efficacy for thistle and Japanese stiltgrass management, testing the effects of the rose rosette disease on multiflora rose and other rose species and cultivars, and evaluating the use of competitive vegetation (including native grasses and forbs), in an effort to provide environmentally
sound and cost-effective methods for suppression of noxious thistle species in Maryland. MDA is now focused strictly on biological control of mile-a-minute weed, using very specific insect biological control agents.

Currently, MDA is in the final months of a two year agreement with the Landscape Operations Division of the Maryland State Highway Administration to administer a program to continue biological control driven suppression of mile-a-minute weed on State highway right of ways. This program includes lab and greenhouse rearing and field release and monitoring of the weevil, *Rhinonconminus latipes*. Funding for rearing and release of the weevil is provided in part by SHA and in part by USDA APHIS.

In 2014, MDA staff continued a rearing program for the mile-a-minute weevil, *Rhinonconminus latipes*. The program involves both rearing of the host plant, mile-a-minute weed, as well as the weevil. The host plants are grown in the MDA greenhouse in Annapolis, MD. In 2014, over 1,500 *P. perfoliata* plants were grown. At the MDA Plant Protection and Weed Management Section, Insect Rearing Lab, MDA staff reared over 6,964 weevils in 2014. Release numbers were supplemented by 5,000 additional weevils acquired from the NJ Dept of Agriculture, Phillip Alampi Beneficial Insects Laboratory. In 2014, 10,056 adult weevils were released at a total of 14 sites statewide, 9 of which were new site locations. *R. latipes* has now been released by MDA staff in the following Maryland counties: Allegany, Anne Arundel, Baltimore, Carroll, Cecil, Charles, Frederick, Garrett, Howard, Montgomery, Prince Georges, Queen Anne’s, Somerset, Washington, and Wicomico.

**NOXIOUS WEED MANAGEMENT**

This program supports the control and eradication of designated noxious weeds Johnsongrass, shattercane, thistles, and multiflora rose in order to reduce their economic and aesthetic impact on farmers and landowners. The Noxious Weed Law requires that a landowner, or a person who possesses and manages land, eradicate or control the noxious weeds on that land by using practices prescribed by the department, including mowing, cultivating, or treating with an approved herbicide. The law prohibits the importation and transportation of these weeds in the state and prohibits the presence of viable noxious weed seed and rhizomes in seed, topsoil, mulch, nursery stock, on farm machinery, or any other article. The Noxious Weed Law also provides that the Maryland Department of Agriculture may enter into an agreement with a county or political subdivision to provide technical and financial assistance for implementing a weed control program. A weed control advisory committee has been established in each of 16 participating counties, with representatives from farming organizations, governmental agencies, local farmers and other property owners.

Noxious weed advisory notices were mailed to 309 managers of property infested with noxious weeds. Generally these notices were effective in obtaining compliance. When necessary, MDA sent follow-up correspondence, mostly resulting in compliance.

The weed control program responds to citizens' requests for technical assistance in controlling invasive, difficult to control, persistent weeds such as phragmites, kudzu, callery pears, and bamboo. **Giant hogweed** (*Heracleum mantegazzianum*) is a federal noxious weed that was first detected in Maryland in 2003, at 29 sites in Baltimore and Harford counties. In 2005, eight additional sites in Garrett County were added to this list, as was one additional site in 2007. There are currently 10 sites in Garrett County that have undergone several years of treatments. Only five sites needed treatment in Maryland this past year; three in Baltimore County, one in Garrett County, and one in Harford County were treated. Frederick County’s weed control program treated the hogweed plants in Baltimore County and the Montgomery County weed control program provided the spray crew and materials to treat the hogweed in Garrett County. Harford County’s Weed Control Program accomplished the Harford County applications. An eradication effort is a multi-year effort.
The weed control staff partnered with the Maryland Department of Natural Resources (DNR) for the 15th year in providing a phragmites management program. Upon request from landowners or managers, the Weed Control Program staff supplied technical and spraying assistance for control. The DNR provided 100 percent of the herbicide (Rodeo®) applied in the nine Eastern Shore counties for spraying phragmites. Total spray revenue for phragmites control was more than $100,000 for treating approximately 103 acres at 160 locations in 19 counties. The spray programs pay for the regulatory and non-regulatory work of the weed control program in the counties.

In all counties, the noxious weed control program’s spraying service was offered to landowners participating in the Conservation Reserve Program (CRP) or Conservation Reserve Enhancement Program (CREP). It is thought that seed contamination at planting is responsible for the occurrence and spread of noxious weeds in these plantings. Due to the likelihood of weed problems occurring on land in these programs, spraying services were offered for noxious weed control.

**OTHER ACTIVITIES**

During 2014, MDA continued to take a leadership role in the Maryland Invasive Species Council (MISC), a forum for information exchange and consensus building among diverse interests in public and private agencies or organizations concerned with invasive species. Several MDA staff members were directly involved with MISC. Participation in MISC allows for cooperation through many state agencies, private industry and the public. Through MISC, MDA has been able to disseminate information on many of the serious pests cited in this report.

MDA continued to administer basic and specialist examinations for the Maryland Certified Professional Horticulturist program. This program was developed by the Maryland Nursery and Landscape Associations (MNLA) to raise and improve the professional standards of Maryland’s nursery, landscape, and garden center industry by giving special recognition to individuals who have shown a high level of competence in the principles and practices of this industry. Certification also allows this high level of attainment to be recognized by the gardening public. Additionally, in 2014 PPWM staff participated in a major rewrite of the training manual and assisted in evaluating the exams that are given.

### Plant Protection and Weed Management Summary of Activities

<table>
<thead>
<tr>
<th>Category</th>
<th>CY2012</th>
<th>CY2013</th>
<th>CY2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beekeepers Registered</td>
<td>1,782</td>
<td>1,821</td>
<td>1,838</td>
</tr>
<tr>
<td>Honeybee Colonies Registered</td>
<td>13,924</td>
<td>14,711</td>
<td>14,412</td>
</tr>
<tr>
<td>Honeybee Colonies Inspected</td>
<td>3,841</td>
<td>2,993</td>
<td>4,515</td>
</tr>
<tr>
<td>Ginseng Dealers Registered</td>
<td>16</td>
<td>19</td>
<td>15</td>
</tr>
<tr>
<td>Ginseng Collectors Licensed</td>
<td>291</td>
<td>186</td>
<td>257</td>
</tr>
<tr>
<td>Nurseries Certified</td>
<td>330</td>
<td>326</td>
<td>309</td>
</tr>
<tr>
<td>Plant Dealers and Brokers Licensed</td>
<td>1,362</td>
<td>1334</td>
<td>1349</td>
</tr>
<tr>
<td>Phytosanitary Certificates Issued</td>
<td>364</td>
<td>693</td>
<td>466</td>
</tr>
<tr>
<td>Plant Pest Surveys # target pests</td>
<td>49</td>
<td>71</td>
<td>41</td>
</tr>
<tr>
<td>Plant Pest Surveys # samples processed</td>
<td>6,820</td>
<td>4,874</td>
<td>2,656</td>
</tr>
<tr>
<td>Target Pests Detected</td>
<td>13</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>Number of noxious weed advisory notices issued</td>
<td>147</td>
<td>222</td>
<td>303</td>
</tr>
</tbody>
</table>
New Hampshire Department of Agriculture, Markets & Food
Division of Plant Industry
Report to the Eastern Plant Board

Summary of 2014 Activities

Nursery Program

Table 1: Licensees, nursery, and hemlock inspections

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensed plant dealers</td>
<td>635</td>
<td>700</td>
<td>725</td>
<td>746</td>
<td>722</td>
</tr>
<tr>
<td>Newly licensed plant dealers</td>
<td>24</td>
<td>53</td>
<td>50</td>
<td>13</td>
<td>24</td>
</tr>
<tr>
<td>Nursery inspections</td>
<td>250</td>
<td>152</td>
<td>119</td>
<td>120</td>
<td>123</td>
</tr>
<tr>
<td>Hemlocks inspected as per quarantine</td>
<td>746</td>
<td>2,212</td>
<td>2,780</td>
<td>2,122+</td>
<td>1,114 of 2,022 imported</td>
</tr>
</tbody>
</table>

Hemlock woolly adelgid quarantine changes

In 2014, the hemlock woolly adelgid (HWA) quarantine was changed to allow plant dealers operating in counties with known HWA populations to import hemlocks from nurseries regardless of the HWA status of the county of origin. This represents a key shift for this quarantine, as prior quarantines only permitted importation of hemlocks from counties which were surveyed annually and not known to have HWA populations. Under this new quarantine, New Hampshire nurseries in the seven quarantined counties (Belknap, Carroll, Cheshire, Hillsborough, Merrimack, Rockingham, and Strafford) provide the New Hampshire Department of Agriculture, Markets & Food (DAMF) notice of receipt of hemlocks by presenting an invoice, or official documentation, and hold hemlocks until they are released for sale by inspectors. Hemlocks may be released for sale with or without an inspection. New Hampshire plant dealers then provide records of sale to DAMF by the end of the calendar year. Plant dealers in New Hampshire counties without a HWA detection (Coös, Grafton and Sullivan) are still required to obtain hemlocks from nurseries in counties which are surveyed annually and not found to be infested with HWA. These hemlocks need to be accompanied by a state phytosanitary certificate or other official documentation.
In 2014, there was a slight reduction in the number of hemlocks imported into New Hampshire, but an increase in the number of Plant Dealers importing hemlocks. The most significant change resulting from this quarantine change was that it broadened the field from which New Hampshire Plant Dealers could purchase hemlocks. Hemlocks were imported from several new states. Changing the quarantine also permitted a wider variety of *Tsuga canadensis* to be imported, with a distinct trend for Plant Dealers bringing in and offering dwarf varieties for sale. Where hemlocks were imported from nurseries without a recent history of sales to New Hampshire Plant Dealers, inspections were conducted.

No HWA were detected on any of the 1,114 hemlocks inspected (roughly 55% of what was imported). Several shipments did, however, show signs of infestation by elongate hemlock scale (8 of the 49 shipments). Infestations ranged from just at detection level to heavily infested. Elongate hemlock scale populations have been detected in five New Hampshire counties (Cheshire, Hillsborough, Rockingham, Merrimack, and Strafford). When light infestations of elongate hemlock scale were found on imported hemlocks, the Plant Dealer was given the choice to return the plants or treat with a systemic insecticide. Most Plant Dealers chose to treat their plants with dinotefuran, as per the recommendations of the NH Division of Forests and Lands. Treated trees were visited periodically by DAMF inspectors and foliage samples exhibiting signs of infestation were collected and examined microscopically. Hemlocks were released for sale when no crawler activity was detected.

These changes to the HWA quarantine have facilitated continued trade in hemlocks; allowed NH Plant Dealers the flexibility to import hemlocks based on quality and price rather than on the HWA status of the county in which the hemlocks were grown; and still facilitate inspection for and detection of plant pests by DAMF inspectors.

### Export Certification:

**Table 2: Export certification numbers**

<table>
<thead>
<tr>
<th></th>
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<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tr>
<td>State certificates issued through PCIT</td>
<td>20</td>
<td>33</td>
<td>36</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Federal certificates issued through PCIT</td>
<td>127</td>
<td>85</td>
<td>86</td>
<td>129</td>
<td>123</td>
</tr>
<tr>
<td>Exporters requesting inspection for international shipments</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

DAMF inspectors provided 144 phytosanitary certificates for four exporters of greenhouse plants in New Hampshire. State certificates were requested primarily for shipments to California (19 PCs), with an additional certificate for a shipment of plants to Oregon and another to accompany plants destined for Florida. For the federal certificates, the vast majority of these were for plants destined to Canada (92 PCs), with the remainder destined for Bermuda (8) and Japan (2). Export certification activities were principally conducted for two exporters. One of the exporters was approached in both 2013 and 2014 about participation in the U.S. Canadian Greenhouse Certification Program. This was suggested for this exporter as it would increase flexibility for the shipper to accommodate last minute order changes. In 2014, staff with that facility prepared a pest management plan, a plant list, and completed the other activities designated in the compliance agreement for this program. Shipping began under this program in early 2015.
Permits Issued

Table 3: Permits issued

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<tbody>
<tr>
<td>525</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>2</td>
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<tr>
<td>526</td>
<td>33</td>
<td>40</td>
<td>55</td>
<td>30</td>
<td>32</td>
</tr>
<tr>
<td>BRS</td>
<td>2</td>
<td>25</td>
<td>17</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>588</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Arthropod identifications

Table 4: Arthropod identifications

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ticks</td>
<td>92</td>
<td>62</td>
<td>54</td>
<td>30</td>
<td>61</td>
</tr>
<tr>
<td>Other arthropods</td>
<td>12</td>
<td>68</td>
<td>26</td>
<td>17</td>
<td>24</td>
</tr>
</tbody>
</table>

CAPS program

A visual survey for plant pests (listed below) was conducted at forty high-volume nurseries. Nurseries were located across all ten of New Hampshire’s counties, with higher concentrations of nurseries surveyed in the population-dense counties of Hillsborough, Merrimack, and Rockingham.

Table 5: Targets of 2014 Visual Nursery Survey

<table>
<thead>
<tr>
<th>Commodity Survey</th>
<th>Target</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWB/BB</td>
<td>Anoplophora glabripennis</td>
<td>Asian Longhorned Beetle</td>
</tr>
<tr>
<td>EWB/BB</td>
<td>Anoplophora chinensis</td>
<td>Citrus longhorned beetle</td>
</tr>
<tr>
<td>EWB/BB, National (AHP), Pine</td>
<td>Monochamus saltuarius</td>
<td>Sakhalin Pine Sawyer</td>
</tr>
<tr>
<td>EWB/BB, National (AHP), Pine</td>
<td>Monochamus sutor</td>
<td>Small White-Marmorated Longhorned Beetle</td>
</tr>
<tr>
<td>EWB/BB, National (AHP), Oak</td>
<td>Agrilus biguttatus</td>
<td>Oak splendour beetle</td>
</tr>
<tr>
<td>Oak, National (AHP)</td>
<td>Tremex fuscicornis</td>
<td>Tremex Woodwasp</td>
</tr>
<tr>
<td>Boxwoods</td>
<td>Cylindrocladium buxicola</td>
<td>Boxwood Blight; Leaf and Stem Blight</td>
</tr>
</tbody>
</table>

No regulated pests were detected. Principle problems detected in survey included: downy mildew, bronze birch borer, volutella blight, magnolia scale, aphids, spider mites, daylily leaf miner, elongate hemlock scale, and pine bark adelgid.
Traps for pests of concern (see list below) were also deployed at five high-volume nurseries in the state. Dependent on pest, traps were deployed starting in mid-June, contents were checked or collected every two weeks, and traps removed late August through early October. Lures were changed according to recommendations.

Table 6: Targets of 2014 Nursery Trapping Survey

<table>
<thead>
<tr>
<th>Commodity Survey</th>
<th>Target</th>
<th>Common Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>EWB/BB, National (AHP), Oak</td>
<td><em>Platypus quercivorus</em></td>
<td>Oak Ambrosia Beetle</td>
</tr>
<tr>
<td>Grape, Oak, Soybean, Stone Fruit</td>
<td><em>Adoxophyes orana</em></td>
<td>Summer Fruit Tortrix Moth</td>
</tr>
<tr>
<td>Oak</td>
<td><em>Archips xylosteanus</em></td>
<td>Variegated Golden Tortrix</td>
</tr>
<tr>
<td>Corn, Cotton, Grape, National (AHP), Oak, Solanaceous, Stone Fruit</td>
<td><em>Thaumatotibia leucotreta</em></td>
<td>False Codling Moth</td>
</tr>
</tbody>
</table>

No regulated pests were detected by the trapping survey. Selected nurseries were highly interested in the program and very cooperative with allowing placement of traps within the nursery.

Exotic Woodborer/Bark Beetle Survey Program

Survey was conducted for exotic woodboring and bark beetles (see list below), monitoring three traps at each of six sites in Grafton County and four sites in Sullivan County. Traps were deployed from May through August depending on species (as below). Samples were collected every 1-2 weeks dependent on rainfall. Samples were screened, sorted, and identified by the SSC.

Table 7: Targets of 2014 Exotic Woodborer Bark Beetle Survey

<table>
<thead>
<tr>
<th>Target</th>
<th>Common Name</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Ips typographis</em></td>
<td>European Spruce Bark Beetle</td>
<td>May—June</td>
</tr>
<tr>
<td><em>Ips sexdentatus</em></td>
<td>Sixtoothed Bark Beetle</td>
<td>May—June</td>
</tr>
<tr>
<td><em>Tomicus destruens</em></td>
<td></td>
<td>May—June</td>
</tr>
<tr>
<td><em>Hylobius abietis</em></td>
<td>Large Pine Weevil</td>
<td>May—June</td>
</tr>
<tr>
<td><em>Pityogenes chalcographus</em></td>
<td>Sixtoothed Spruce Bark Beetle</td>
<td>May—June</td>
</tr>
<tr>
<td><em>Tetropium fuscum</em></td>
<td>Brown Spruce Longhorn Beetle</td>
<td>July—August</td>
</tr>
<tr>
<td><em>Tetropium castaneum</em></td>
<td>Black Spruce Beetle</td>
<td>July—August</td>
</tr>
<tr>
<td><em>Monochamus alternatus</em></td>
<td>Japanese Pine Sawyer</td>
<td>July—August</td>
</tr>
</tbody>
</table>
No regulated pests were detected. The numbers of *Monochamus spp.* caught in the *Monochamus alternatus* traps were significantly higher than in previous years, likely due to the monochamol lures.

Genera of bark beetles collected included: *Conophthorus, Cryphalus, Crypturgus, Dendroctonus, Dryocoetes, Gnathotrichus, Hylesinus, Hylastes, Hylurgops, Ips, Monarthrum, Orthotomicus, Pityogenes, Pityophthorus, Polygraphus, Pseudopityophthorus, Trypodendron, Xyleborinus, Xyleborus, Xylechinus, Xylosandrus* and *Xylotherinus*.

Genera of longhorn beetles collected included: *Acmaeops, Anthophylax, Asemum, Clytus, Eupogonius, Evodinus, Judolia, Leptura, Liopinus, Microgoes, Monochamus, Rhagium, Sarosethes, Stictoleptura, Tetrodium, Trigonarthris, Urgleptes*, and *Xylotrechus*.

**Farm Bill—Grape Commodity Survey**

**Figure 1**: Surveyed vineyard in Cheshire County

**Figure 2**: SWD “red cup” trap in a vineyard in Hillsborough County. The trap is baited with a bread yeast dough, replaced weekly, and SWD males and females are captured in apple cider vinegar.

**Figure 3**: Developing grapes in a vineyard in Hillsborough County as SWD catches begin to increase close to harvest.
A trapping survey for five grape commodity tortricid moth pests (listed below) was conducted at a total of five grape vineyards within Cheshire, Hillsborough, Rockingham, and Strafford Counties. Pest phenology dictated deployment which began in June. Traps were checked every two weeks, liners replaced as necessary, and lures changed according to longevity. Traps were removed from the end of August through to the end of September, dependent on pest. Additionally, *Drosophila suzukii*, spotted wing drosophila (SWD), traps were deployed, two at each site, starting in mid-July and checked weekly to bi-weekly through September. One SWD trap was deployed within the orchard, and one in the tree-line or tree-fruit crop proximate to the grape orchard. SWD traps were baited with a bread yeast bait, and captured flies were collected in apple cider vinegar and brought back to the lab for identification and sexing.

### Table 8: Targets of 2014 Grape Commodity Survey

<table>
<thead>
<tr>
<th>Target</th>
<th>Common name</th>
<th>Abb.</th>
<th>Lure longevity</th>
<th>Pheromone blend</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Lobesia botrana</em></td>
<td>European grape-vine moth</td>
<td>EGM</td>
<td>28 day lure</td>
<td>(E,Z)-7,9-12Ac</td>
</tr>
<tr>
<td><em>Adoxophyes orana</em></td>
<td>Summer fruit tortrix</td>
<td>SFT</td>
<td>84 day lure</td>
<td>(Z)-9-14Ac (E,E)-9,11-14Ac</td>
</tr>
<tr>
<td><em>Epiphyas postvittana</em></td>
<td>Light brown apple moth</td>
<td>LBAM</td>
<td>42 day lure</td>
<td>(E)-11-14Ac (E,E)-9,11-14Ac</td>
</tr>
<tr>
<td><em>Eupoecilia ambiguella</em></td>
<td>European grape berry moth</td>
<td>EGBM</td>
<td>42 day lure</td>
<td>(Z)-9-12Ac 12Ac 18Ac</td>
</tr>
<tr>
<td><em>Thaumatotibia leucotreta</em></td>
<td>False codling moth</td>
<td>FCM</td>
<td>56 day lure</td>
<td>(E)-8-12Ac (Z)-8-12Ac</td>
</tr>
<tr>
<td><em>Drosophila suzukii</em></td>
<td>Spotted wing drosophila</td>
<td>SWD</td>
<td>7—10 days</td>
<td>NA</td>
</tr>
</tbody>
</table>

No regulated pests were detected in the pheromone-baited traps. SWD were captured in the yeast-baited traps starting in early August and numbers of trapped SWDs increased dramatically over a 6 week period until traps were removed coinciding with harvest of grapes (Figs. 4 and 5). SWD was trapped at all five farms, which varied in geographic location, varieties present, topography, surrounding area, and grapevine age. Magnitude of catch varied significantly between grape orchards. Highest catches were at a vineyard with no previous experience with SWD without a SWD spray program. Lowest catches were at a vineyard located in an urban setting, with very young grapevines, and lower grape production per vine. Another vineyard in the survey also participates with UNH Cooperative Extension and pesticide industry researchers on projects to control vineyard pests, including SWD. The pesticide industry researchers had SWD traps concurrently in the same orchard. After DAMF provided the orchardist with SWD catch per day values for the season, the pesticide company performed a similar transformation to their catch data, and the two sets of data shared remarkable overlap indicating a consistency of measures of SWD populations within that vineyard.
Figure 4: Mean SWD captured per trap per day across all five surveyed orchards

Figure 5: Mean (±SEM) SWD captured per vineyard per sampling period
National Emerald Ash Borer Survey

Table 9: Panel traps deployed in NH

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counties Surveyed</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>9*   (10)</td>
</tr>
<tr>
<td>Total traps in NH</td>
<td>146</td>
<td>150</td>
<td>350</td>
<td>500</td>
<td>342* (391)</td>
</tr>
<tr>
<td>Total traps deployed by DAMF</td>
<td>146</td>
<td>100</td>
<td>50</td>
<td>43</td>
<td>51</td>
</tr>
<tr>
<td>Total EAB detected</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0*   (10)</td>
</tr>
</tbody>
</table>

* indicates purple panel traps deployed under the USDA APHIS trapping program. Numbers following in parentheses also incorporate a survey conducted by the NH Division of Forests and Lands using green panel traps baited with 3-Z-hexanol and 3-Z-lactone lures.

In 2014, the State of New Hampshire participated in the APHIS emerald ash borer (EAB) detection trapping survey. As part of this survey, 342 traps were deployed in the 9 counties of New Hampshire without EAB detections (Belknap, Carroll, Cheshire, Coös, Grafton, Hillsborough, Rockingham, Strafford, and Sullivan). DAMF inspectors deployed 51 traps in Rockingham County, considered high risk for detection of EAB due to proximity to known populations in neighboring Essex County, Massachusetts. No emerald ash borer were detected in these traps.

The New Hampshire Department of Resources and Economic Development (DRED) Division of Forests and Lands deployed 49 green panel traps baited with 3-Z-hexanol and 3-Z-lactone lures at wood reload yards around the state (4 traps) and within six miles of known infested trees (45 traps). Traps were deployed primarily in Merrimack (37 traps) and Rockingham (11 traps) Counties. One trap was deployed near a log processing facility in Grafton County. None of the traps positioned near reload yards captured any EAB. Four of the traps deployed at sites within six miles of a known infested tree captured EAB (9%), and these traps together captured a total of 10 EAB, six in Merrimack County (three from a known infested site) and four in Rockingham County.

Emerald ash borer detections and quarantine activity in New Hampshire

On August 21, 2014, emerald ash borer adults were detected on a green panel trap deployed in the Salem, NH area. This represents the first detection of an emerald ash borer population in New Hampshire using a trap. All other detections of emerald ash borer in the state have been a result of visual survey for "blonding" caused by woodpeckers. Emerald ash borer larvae were detected in trees in Hillsborough County on October 8, 2014 and later confirmed by official identifiers. As of October 30, 2014, the EAB quarantine area in New Hampshire consists of the entirety of Hillsborough, Merrimack and Rockingham Counties. The new counties of Hillsborough and Rockingham County were added to the Federal Order on March 24, 2015. Populations of EAB have been found within these quarantine areas (Fig. 6), and the DRED Division of Forests and Lands in cooperation with UNH Cooperative Extension and other partners have been conducted EAB training sessions for loggers and landowners throughout the quarantine area, as well as developing best management practices for harvesting and utilizing the ash resource within the quarantine area.

The Division of Plant Industry has been conducting inspections and audits for compliance with EAB quarantines within the three-county quarantine area. In 2014 there were 26 compliance agreements
issued to handle regulated articles within New Hampshire. These included: mills, lumber kiln-dryers, biofuel plants, chippers, firewood heat-treatment facilities, loggers, sawyers, and truckers both within the quarantine area and outside of the quarantine area. Since the initial quarantine in 2013, there has been some turn-over in who is issued a compliance agreement as entities either continue to actively work with ash in the quarantine area, begin to work with ash in the quarantine area, or decide to no longer work with ash in the quarantine area. Audits of activities have been generally positive, with some entities providing exceptional documentation of their regulated activities. Problems, where they existed, were in determining which of the certifying documents to use (Certificate or Limited Permit), and misplacement of used Certificates and Limited Permits. Violations have been issued and agreements cancelled when warranted.

Figure 6: Current EAB infestations in New Hampshire. Red areas have known EAB infestations, orange areas designate the 10 mile expansion area surrounding known infestations. The purple line demarcates the EAB quarantine area within New Hampshire.
Firewood Quarantine:

In 2014, the NH Forest Rangers (part of DRED Division of Forests and Lands) conducted firewood checkpoints during major holiday weekends and at the New Hampshire Motor Speedway (NHMS) for the several days leading up to the July NASCAR race. The NASCAR races at the NHMS constitute the largest camping events in the state with 75% of its 5,000 campsites occupied by out-of-state visitors. The Forest Rangers conducted similar checkpoints during the July and September races in 2013. Division of Plant Industry staff was on hand throughout the enforcement activities to provide outreach to violators, answer quarantine-specific questions, and assist in handling of confiscated wood and data management.

The Division of Plant Industry, NH Forest Rangers, US Forest Service, APHIS, and NHMS staff analyzed enforcement activity data at the NHMS during the three conducted checkpoints to look for trends in firewood movement. The data was presented in poster form (Figs. 7—12), first at the EAB Research and Technology Development meeting in October, 2014 in Wooster, Ohio, and then at several other meetings. In brief, there were 225 confiscations of out-of-state firewood over the 9 days of enforcement activity. Confiscated firewood included both green and seasoned wood, with volumes ranging from only a few sticks to full truckloads per violation. Most intercepted firewood (80%) originated in neighboring northeastern states and was transported 49 to 200 miles to NHMS (primarily from Maine, Massachusetts and Vermont). As expected, the number of firewood confiscations from out-of-state decreased with increasing distance from NHMS, with 12% being transported 201-300 mi, 6% transported 301-400 mi, and 2% transported 401-700 mi. This reduction in confiscations with distance may be due to the geographic draw of NHMS rather than to a change in the willingness to transport firewood based on distance. For instance, transcontinental firewood movement from as far as Florida, California and Washington was also observed. Additionally, confiscated firewood originating from the Canadian provinces of Quebec and Prince Edward Island was also found during this enforcement activity in spite of Customs and Border Protection inspections. No firewood originating from known ALB-infested areas was intercepted, although 2% of confiscated firewood originated from towns adjacent to ALB quarantine areas in Massachusetts and New York. Fifteen percent of confiscated firewood originated in areas with known EAB infestations.

Fig. 7. An example of one of the several camping areas at the NHMS. There are approximately 5,000 camp sites at NHMS, with about 75% occupancy by out-of-state visitors, making it a prime target for outreach about the risks of moving firewood. The use of campfires is common.
Fig. 8. Aerial view of the track at the NHMS in Loudon, Merrimack County, NH. Note the proximity to hardwood woodlands and some of the highest density ash forest in the state. An EAB infestation was detected in adjacent forests in March 2014.

Figure 9. NH Forest Ranger inquiring about presence of out-of-state firewood on NHMS entry road (a); processing a violation (b); and destruction of wood at Loudon Town Transfer Station (c).
Fig. 10. Location of the NHMS (red circle) and other paved oval tracks located in the USA (black circles). Counties of origin for confiscated firewood are shaded from yellow (1-2 incidences) to dark brown (9+ incidences). While most incidences of firewood movement were from nearby states, several originated from out-of-state EAB quarantine areas and others included transcontinental and international movement.

Fig. 11. Examples of single violations confiscated at enforcement activities at NHMS.
Financial considerations precluded the ability to conduct a firewood checkpoint at the NHMS in September, 2014. The September race differs distinctly from the July race in that fewer families attend as the children are back in school, and expectations of colder nights increase the volumes of firewood transported per individual. There was an interest, on the part of Plant Industry staff, in making some measurement of firewood transportation to the race, rather than miss the opportunity entirely. A quick-and-dirty survey of firewood transportation was conducted from 1-3:30 pm on Friday, September 19, 2014. Observers from DPI stood on the I-393 overpass just west of the exit for the NHMS. By looking west, trucks, campers, and trailers with out-of-state plates could be identified and targeted for inspection. As the targeted vehicles passed under the overpass, the beds of the vehicles could be examined for the presence of firewood.

The drawbacks to this survey included: 1) true origin of the firewood could not be determined because there was no interaction with the driver, however, most firewood looked like it was part of the original packing of the vehicle rather than added later; 2) there was no interaction with drivers limiting value of the activity for outreach and opportunities to influence future behavior; 3) most vehicles and pick-up truck beds were covered, reducing the success of this visual survey, suggesting this survey
underestimated actual firewood movement; and 4) observations were limited to those vehicles approaching the NHMS from the west, not those vehicles arriving at the NHMS. Despite the drawbacks, this activity demonstrated that there was significant firewood that moved to the NHMS during the September race (Table 10), and that additional outreach activities and enforcement events are required to influence firewood-transporting behavior. Volumes of firewood ranged from a few sticks to entire pick-up truck bed-loads (almost 25% of those transporting visible firewood filled their entire truck).

Table 10: Visual survey of firewood movement in a 2.5 hour period on September 19, 2014

<table>
<thead>
<tr>
<th>State of License Plate</th>
<th>Number of Vehicles</th>
<th>Number of Vehicles with Visible Firewood</th>
<th>Percentage with Visible Firewood</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Colorado</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Connecticut</td>
<td>32</td>
<td>3</td>
<td>9.4%</td>
</tr>
<tr>
<td>Florida</td>
<td>4</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Georgia</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Maine</td>
<td>15</td>
<td>1</td>
<td>6.7%</td>
</tr>
<tr>
<td>Maryland</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td>123</td>
<td>18</td>
<td>14.6%</td>
</tr>
<tr>
<td>New Jersey</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>New York</td>
<td>50</td>
<td>2</td>
<td>4%</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>2</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Rhode Island</td>
<td>12</td>
<td>4</td>
<td>33.3%</td>
</tr>
<tr>
<td>Vermont</td>
<td>51</td>
<td>7</td>
<td>13.7%</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>304</strong></td>
<td><strong>35</strong></td>
<td><strong>11.5%</strong></td>
</tr>
</tbody>
</table>

Invasive Plant Control Demonstration Project:

Mr. Doug Cygan, Invasive Species Coordinator with the Division of Plant Industry conducted a multi-year invasive plant control demonstration project along right-of-ways in New Hampshire. The goal of the project was to draw attention to the opportunities and techniques used to reduce invasive plant populations, as well as to encourage municipalities and landowners to employ similar measures. In addition to chemical control on right-of-ways, the effort included significant outreach consisting of presentations to municipal councils and public groups.

In 2014, in cooperation with the NH Dept. of Transportation and under Special Permit (SP-147), Mr. Cygan treated approximately 26 acres of Japanese knotweed (*Fallopia japonica*), and 6,589 woody invasive plant stems along eight state highways and three federal highway systems. The Department of Transportation provided project support and funding for purchase of herbicide products. Woody invasive plants targeted included Japanese barberry (*Berberis thunbergii*), oriental bittersweet (*Celastrus orbiculatus*), autumn olive (*Elaeagnus umbellata*), burning bush (*Euonymus alatus*), glossy buckthorn (*Rhamnus frangula*), honeysuckle (*Lonicera spp.*), and common buckthorn
Methods of control included foliar sprays for herbaceous species and some woody invasive shrubs, and low volume basal bark for most woody species. Compounds used for control included Roundup Pro Concentrate, Garlon 4 Ultra, and Milestone.

Table 11: Invasive plant species control demonstration project

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td># of woody stems treated</td>
<td>2,690</td>
<td>7,000</td>
<td>6,589</td>
<td>16,279</td>
</tr>
<tr>
<td>Acres of knotweed treated</td>
<td>23</td>
<td>43</td>
<td>25</td>
<td>91</td>
</tr>
</tbody>
</table>

Japanese stilt-grass and mile-a-minute:

In 2013, Japanese stilt-grass (*Microstegium vimineum*) had not yet been detected in New Hampshire. Mile-a-minute vine (*Polygonum perfoliatum*) was known from one nursery which has been cooperating with the Division of Plant Industry to manage this invasive plant on its property. This nursery is one of the larger wholesale nurseries in the state, and in late August, 2013, Japanese stilt-grass was detected here as well. In 2014, Division staff selected and surveyed ten other large nurseries that receive out-of-state nursery stock. Japanese stilt-grass was found at seven of those nurseries, with populations ranging from minor to severe. Plant Industry personnel have made recommendations to these nurseries to mitigate the continued spread of this invasive through use of a glyphosate-based product as well as a pre-emergent. Fact sheets were enclosed with the Plant Dealer licensing mailing to all NH Plant Dealers in November, 2014.

Apiary Inspection Program:

Apiary registration is voluntary in New Hampshire. The Division employs a part-time apiary inspector who inspects hives for concerned beekeepers as needed. Activity in 2014 did not differ from that in previous years, with principle concerns including heavy mite loads, nutrition problems, Nosema due to the longer winter, and hive loss due to foraging bears.

Table 12: Apiary program

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered apiaries</td>
<td>245</td>
<td>274</td>
<td>293</td>
<td>306</td>
<td>351</td>
</tr>
<tr>
<td>New apiary registrants</td>
<td>34</td>
<td>30</td>
<td>19</td>
<td>13</td>
<td>45</td>
</tr>
<tr>
<td>No. of apiary inspections</td>
<td>11</td>
<td>19</td>
<td>9</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>No. colonies inspected</td>
<td>24</td>
<td>48</td>
<td>21</td>
<td>38</td>
<td>.</td>
</tr>
<tr>
<td>No. colonies entering the state</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>No. beekeepers meetings attended by Division personnel</td>
<td>18</td>
<td>25</td>
<td>25</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>No. bee school classes participated in by Division personnel</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
NEW JERSEY DEPARTMENT OF AGRICULTURE  
DIVISION OF PLANT INDUSTRY  
REPORT TO THE EASTERN PLANT BOARD  

SUMMARY OF 2014 ACTIVITIES  

APIARY INSPECTION  

During the 2014 season New Jersey had 1,814 registered beekeepers, an increase from 1,696 registered in 2013. There were 2,419 apiaries in the state, a 4% increase from the numbers reported the previous year. Unofficial estimates indicate that there could be between 3,500-4,000 beekeepers in the state. During the year, Division staff examined 1,417 colonies in 147 apiaries for brood disease and parasites. The program detected 5 cases of American Foul Brood, a 0.35% increase from levels the previous year and a 1.8% increase of European Foul Brood disease. The apiarist certified the bee yards of 19 beekeepers who sell nucs and queens, which remained the same as last year. A total of 800 nuc hives and over 2,000 packages were imported into New Jersey for sales to new or expanding beekeepers.

The winter of 2013-2014 in New Jersey was brutal with record snow fall and extremely cold temperatures. New Jersey had a 32% winter death loss during the winter of 2013 - 2014, up from 31% the previous year. A statewide survey conducted on winter death loss showed that in 2014 beekeepers that did nothing to control Varroa mites lost 44% of their colonies, while beekeepers that provided some treatment to control Varroa lost 29% of their colonies. The apiarist continues to tell beekeepers how important it is to check mite levels 2-3 weeks after treatment to ensure their treatments are effective. After six years of questioning beekeepers in New Jersey about management practices, we have discovered that beekeepers who do nothing to control mites lose an average of 49% of their colonies, while those that do control mites lose an average of 25% of their colonies. Also, beekeepers that do effective mite control and begin their control measures in July and August have a significantly lower death loss than those that start later in the year.

The 2014 bee season was a breath of fresh air. The winter was long, cold and snowy and the spring temps were very cool. The bees that had low Varroa mite loads and plenty of food stores came through the winter strong. Once the bees started gathering nectar and pollen they kept it up right through the first week of July. The honey crop for
New Jersey was the largest in the last 5 years. However, the fall honey flow was poor and colonies needed supplemental feeding to get ready for winter.

A total of 16,213 honeybee colonies were brought into New Jersey from Florida, Maryland, Louisiana, and South Carolina for commercial pollination of fruit crops, blueberries, and cranberries. The number of colonies coming in for pollination has been increasing every year for the past 4 years. Overall, the quality of the hives brought in for pollination was good.

This season, when the bees were released from blueberry pollination, three New Jersey commercial beekeepers noticed damage to their colonies. There were failed queens in about 25% of their colonies, as well as a decline in frames of brood. The brood pattern was scattered in a percentage of the affected colonies and another percentage of their colonies had sealed brood and eggs but no larva. The Bee Informed Partnership out of the University of Maryland was contacted by two of the beekeepers to analyze and compare samples from affected and non-affected colonies. Nothing definitive was found. There was a meeting between researchers from the Rutgers Blueberry Cranberry Research Station, the State Apiarist, and the affected beekeepers to alert the industry about this problem. There is currently a research project in the works for the 2015 season to try to identify what factors may have caused this damage.

The apiarist and seasonal inspector conducted three 3 day beginner beekeeping courses in cooperation with Rutgers University. A total of 240 new beekeepers took these courses. The apiarist also assisted in the development of 3 beginner beekeeper classes offered by branches of the New Jersey Beekeepers Association. The topics in these classes taught by NJDA personnel are “Diseases and Parasites, Biology, and How to keep your colonies healthy”. There were over 120 new beekeepers trained through these classes in 2014. This year the apiarist held a 2 day class for more advanced beekeepers. The class consisted of morning lectures followed by “hands on” practice sessions during the afternoons. One of the best received elements of the class was treating for Varroa mite, and queen rearing on a small scale. The demand for this class is very strong.

The apiarist gave 27 presentations to various grower groups, health officer trainings, schools, and beekeeper meetings. The Department remains focused on education, because “an educated beekeeper is often a better beekeeper” and an educated public will better understand the importance of honey bees and their behavioral differences from wasps and hornets. There still remain many beekeepers that cannot identify bee diseases or mites and a group who fail to control Varroa mite populations in their colonies.

The apiarist is actively encouraging New Jersey beekeepers to develop businesses selling New Jersey raised nucs and queens. Our goal is for these bee breeders to raise queens from colonies that successfully overwintered in the state and continue to produce a sound honey crop.
The apiarist and some members of the New Jersey Beekeepers Association developed a beekeeping calendar to remind New Jersey beekeepers what needs to be accomplished for their hives on a month to month basis. The response to this educational tool in the New Jersey beekeeping community has been great. Over 600 calendars were printed and distributed to beekeepers throughout the state for calendar years 2013 and 2014. The beekeepers are very happy to have a visual reminder of the things they should be planning and doing on a monthly basis.

The Bee spill emergency action plan was updated again in 2014. The plan utilizes Department of Agriculture personnel, commercial beekeepers and 40 volunteer helpers who have protective gear, some equipment, and are willing to respond if assistance is needed.

**NURSERY INSPECTION PROGRAM**

**New Jersey Law** requires that all nursery stock (hardy trees, shrub and perennials) sold in New Jersey be free of injurious pests, ensuring that ornamental plants purchased by consumers do not contain pests that could spread to other plants. Specific state quarantines and/or inspection programs also exist for Rose plants, Vegetable transplants and blueberry plants.

**Nursery inspection** staff inspected 17,271.88 acres of nursery stock and 7,068,492 sq. ft. of greenhouse plant material in 2014 at 1,142 locations to certify freedom from dangerous insects and diseases. The most frequently observed pests were bagworm, white pine weevil, Japanese beetle, spider mite and a variety of scale insects.

A reduction in the number of nursery/greenhouse locations occurred in New Jersey. This data is corroborated by a 5% reduction in nursery acreage along with a 3% reduction of greenhouse square footage and 53 fewer sites throughout the state compared to the previous year.

Division of Plant Industry nursery inspection staff continued “winter” inspections at major nurseries that ship products interstate. These inspections are completed in order to detect overwintering injurious insect pests.

A total of 677 Nursery **Plant Dealers** (garden centers, box stores and landscape firms) were inspected in 2014. The list of certified nurseries and plant dealers is posted on the Division’s website and is updated monthly. Plant dealer inspections are conducted through the documentation and verification of sources of certified plant material, as-well-as visual inspections of plant material at these plant dealer locations.

**Blueberry Plant Certification Program** Spring and fall inspections were completed for blueberry plant producers participating in the Blueberry Plant Certification Program. The spring phase of the “Blueberry Plant Certification Program” was completed by inspecting 45,048 “Mother Plants” (plants used for vegetative propagation). In 2014, a total of 7 nurseries participated in the certification program; 4 in Atlantic County, 2 in Burlington County and 1 in Gloucester County. Fall inspections of these plants at 11 nursery locations were also completed for the final certification of blueberry plants. For
the certification program a total of 2,645,082 blueberry plants were inspected, (45,048 mother plants; 1,322,221 nursery plants; 1,277,210 cuttings and 603 containers). Of the total plants inspected, 2,509 plants were found infected and destroyed (37 with stunt virus, 2,447 ring-spot virus, 1 Mosaic virus). A total of 24 Dodder infestations were also found and destroyed.

A total of 293 phytosanitary inspections were completed through the USDA-APHIS PCIT system during the 2014 year. The Division's inspectors issued 173 State Phytosanitary Certificates for shipments of dormant and blooming bulb plants, assorted tree/shrub seedlings, blueberry and jasmine plants, poinsettia cuttings, assorted annual plugs, orchids and geranium cuttings to Puerto Rico and the central, western and southern states. A total of 120 Federal Phytosanitary Certificates were issued enabling the export of poinsettia cuttings, assorted nursery stock, dormant bulbs, fruit scion wood and re-exports of Chilean blueberry fruit. Canada, Bermuda and The United Kingdom were the top three countries receiving plant material from New Jersey.

The Japanese Beetle Harmonization plan allows for the shipment of plant material from states with established Japanese beetle populations, to states which have limited or no presence of the beetle. A compliance agreement was issued by the Division to a greenhouse operation to facilitate the shipment of pepper and eggplant plants to all “Category 1” states, where Japanese beetle does not occur.

Two greenhouse operations are under other compliance agreements developed by officials within the Division and have been approved by the receiving states. These compliance agreements consist of requirements to eliminate the presence of European corn borer and the Colorado potato beetle.

The White Pine Blister Rust quarantine regulations (N.J.A.C. 2:20-2) prohibit the planting of European Black Currant plants anywhere within the state, except under permit. The planting of red currants and gooseberries is also prohibited in a protected area in the municipalities of Montague, Walpack, Sandyston, and Vernon Townships in Sussex County; West Milford, Ringwood Borough and Wanaque Township in Passaic County; and Jefferson Township in Morris County. The Department has issued and monitored three permits for a total of 224 Ribes spp. plants grown for fruit production. Expiration of these permits will occur in the year 2018, when there will be no more renewals. Currently, "Consort", "Coronet", "Crusader"; and "Titania" were the cultivars which were recognized as being resistant to White Pine Blister Rust when the permits were issued. Recent scientific evidence has documented that these cultivars are not truly resistant varieties to this disease.
CANADIAN BLUEBERRY FRUIT CERTIFICATION PROGRAM

Thirty-three blueberry growers in southern New Jersey were approved to participate in the 2014 Canadian Blueberry Fruit Certification Program. Three growers were new to the program and were trained by Division staff on the pest management and shipping protocols for the control of the blueberry maggot *Rhagoletis mendax*.

Division staff monitored the pesticide application, shipping and cooking records for participating growers in accordance with the certification program criteria. This season there were 29 growers from Atlantic County, 3 growers from Camden County and 1 grower from Burlington County in the program.

Twenty-three of the twenty-nine growers shipped over 733,551 crates of fresh blueberries to Canadian markets. This was 16% less than last year’s shipments of 870,000 crates and 23% less than was shipped in 2012. The shipping window that New Jersey has traditionally enjoyed has significantly started to shrink, as more growing regions are coming into production.

PLANT PEST SURVEY

The Department participated in the Cooperative Agricultural Pest Survey (CAPS) Program, a cooperative effort between the USDA APHIS Plant Protection and Quarantine Program (PPQ), state universities and state Departments of Agriculture throughout the United States.

A Bundled Nursery Survey was conducted on 5 nurseries in Burlington County. The target pests for this survey were Mulberry Longhorned Beetle (*Apriona germari*), Maritime garden snail (*Cernuella virgata*), Light Brown Apple Moth (*Epiphyas postvittana*), Asian gypsy moth (*Lymantria dispar asiatica*), Mountain Oak Longhorned Beetle (*Massicus raddei*), and the Velvet Longhorned Beetle (*Trichoferus campestris*).

Black light traps were deployed at these five sites to trap for the Mountain Oak Longhorned Beetle (*Massicus raddei*), the Mulberry Longhorned Beetle (*Apriona germari*), and the Velvet Longhorned Beetle (*Trichoferus campestris*) for three months. The traps were powered by solar panels allowing them to be deployed in remote locations where no power source was available. Traps were serviced 2-3 times per week and trap catches were stored in a freezer for screening at a later date. No suspects were found in any traps. Lindgren Funnel Traps with alcohol lures were also deployed at these five sites as an additional method for detection of *T. campestris*. No suspects were found in any of the Lindgren Funnel Traps.

Delta traps with pheromone lures were deployed at five sites for Light Brown Apple Moth (*Epiphyas postvittana*) and were also maintained for three months. No suspected LBAM were identified. Milk carton traps with string lure were deployed at five sites for the detection of the Asian Gypsy Moth (AGM). Suspect moths were sent to CPHST for PCR screening, but no AGM was detected.
The fields at these five sites were also visually inspected for invasive snails once every two weeks during the three month survey. No suspected *Cernuella* were observed at any of the nurseries.

The Division of Plant Industry staff continued a survey for the **Velvet Long Horned Beetle** (*Trichoferus campestris*) in 2014. The site of this survey is an abandoned farm in Burlington County, where *T. campestris* was found in imported Chinese vines in 2013. One black light trap was deployed at the site for three months. Trap catches were frozen for screening at a later date. Additional trapping was conducted at the site by USDA. No suspects were found in any of the trap catches. Trees at the site were limbed, and select branches were taken to CPHST’s Otis lab in Buzzard’s Bay, MA for inspection and rearing of potential suspects. No results from this collection have been reported at this time.

The **Emerald Ash Borer** (*Agrilus planipennis*) continued to expand its range and destroy millions of ash trees throughout the Central United States, the Mid-Atlantic States and parts of New England. New Jersey participated in the **Emerald Ash Borer (EAB) National Survey** in 2014. A total of 351 sites were inspected for host trees. Of those sites, 189 were selected for survey. The Department worked in cooperation with staff from the New Jersey Forest Service and the Monmouth County Shade Tree Commission to maintain traps at these 189 sites. Division staff trapped 153 sites; the NJ Forest Service was responsible for 18 sites and the Monmouth County Shade Tree Commission maintained 18 sites. The survey was conducted in Burlington, Camden, Gloucester, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Somerset, and Sussex counties, using trapping locations determined by a US Forest Service computer model.

A loose grid of one km x one km squares scattered throughout the state were inspected for host trees. A trap site was defined as any location containing ash trees where permission for trapping could be secured. For each grid exactly one trapping site was chosen.

Trapping sites included federal, state and county parks, wildlife management areas, private homes, campgrounds and farms. Lures were changed once and traps were inspected twice throughout the trapping season. Traps were initially prescreened by surveyors in the field and select insect specimens were collected and delivered to the Plant Laboratory for further screening.

In May 2014, a landscaping company reported EAB damage to the Department at a property they were working on in Bridgewater Township, Somerset County. Investigations discovered classic damage to some of the ash trees at the site along with live larvae and a dead adult in an infested tree. Following the initial discovery in Bridgewater Township, a second site was discovered in Hillsborough Township, Somerset County. Because the findings were in an area at the southern edge of the native ash resources of the state, the Department entered into the Federal EAB quarantine, which quarantined the entire state. Following a press release about the EAB discovery in the state, division staff had responded to hundreds of phone calls from
residents reporting potential Emerald Ash Borer (EAB) infestations. All follow up investigations at these homeowner properties had been negative for EAB and identified severe ash decline resulting from a combination of ash yellows disease and native ash wood borers.

Letters explaining the guidelines of the federal EAB quarantine were mailed to 116 shipping nurseries, which frequently ship deciduous trees to other states. These letters explained the regulations for quarantine compliance and included reference materials about this insect.

In August an adult Emerald ash borer beetle was recovered from a purple survey trap located in Westampton Township, Burlington County. The identification was confirmed by USDA APHIS Plant Protection and Quarantine entomologists. This was the first EAB caught in an EAB trap in the state. On September 25th another EAB adult was collected from a trap in Mercer County and also confirmed by the USDA. All told, three counties were confirmed positive in 2014 year for this insect.

**BIOSURVEILLANCE SURVEY FOR EAB**

*Cerceris lumnipennis*, a native ground nesting wasp, has been used in other states as a biosurveillance tool for the presence of the EAB. USDA APHIS provided funding to the Department through the 2013 Farm Bill to search for *Cerceris* sites and use these sites to identify areas with low population levels of EAB in New Jersey.

From May through August 2013, a total of 43 areas in Mercer, Bergen, Hunterdon and Sussex Counties were surveyed for the presence of *Cerceris* wasps. No nesting sites for *Cerceris* were found. All of these sites contained *Sphex spp.* and *Bembicini, spp.* (digger and sand wasps). Only one site discovered late in July, in Bergen County was found containing four active *Cerceris* nests. Since its discovery, staff had monitored the nests resulting in no EAB collected from this area.

During the 2014 survey season, a total of 66 additional areas in Warren, Somerset, Sussex, Morris, Union and Hunterdon Counties were surveyed for the presence of *Cerceris* wasps. From all of the sites surveyed, only two sites, one each in Warren and Somerset Counties were found to be positive for *Cerceris* and in both cases only two active nests were found.

In June 2014, plans were to begin monitoring the positive locations in Bergen, Warren and Somerset Counties. All three sites were found on ball fields at school locations. The location in Bergen County was completely covered with Astroturf and the other locations were destroyed by ball field grooming activities from July through August.

Because we continued to try to identify areas where populations of this insect occurred in the northern counties of the state, field staff spent the majority of their time trying to identify active nesting areas instead of conducting monitoring activities of undisturbed nests. With the expansion of the survey area into additional counties, an overall total of 112 locations (43 areas in 2013 and 69 areas in 2014) were surveyed in seven
counties for the presence of Cerceris. The only three positive locations found in Bergen, Warren and Somerset Counties contained eight active nests. Unfortunately, they were all destroyed by human disturbance.

GYPSY MOTH SUPPRESSION

Populations of gypsy moth have declined to almost non-existent levels in the state as a result of effective treatments, heavy parasitism and increased activity of Entomophaga maimaiga during the spring of 2009. No spray program was conducted during the spring of 2014.

The 2014 statewide gypsy moth aerial defoliation survey showed a 46% decrease in gypsy moth defoliation throughout the state, compared to the levels the previous year. Defoliation occurred on 1,330 acres in 24 municipalities and 11 counties throughout the state. The majority of defoliation occurred in scattered locations in Morris, Passaic, Bergen and Sussex Counties. The Division of Plant Industry contacted the administrations of the affected municipalities to arrange for ground egg mass surveys. A total of 21 municipalities and one county park system requested gypsy moth egg mass surveys during the fall of 2014. Surveys were also conducted in an additional 38 municipalities, which historically had gypsy moth problems. From these surveys, a total of 498 acres of gypsy moth infestation had initially been proposed for treatment in the spring of 2015. Two municipalities opted not to participate in the Aerial Suppression program, so plans are to treat 4 blocks during the spring, totaling 288 acres in Morris County in the spring of 2015.

FARM BILL FUNDED PEST SURVEY PROGRAMS

Since 2009, New Jersey participated in the Forest Pest Outreach and Survey Project (FPOSP) a forest pest outreach and education program sponsored by the USDA APHIS PPQ. This year NJDA outreach staff attended 37 events consisting of 43 days. A total of 38,992 people were educated on invasive forest pests by staff members while visiting our display at outreach events or lectures. Also, there are 5 permanent displays set up at two zoos, two insect museums and a forestry education center that are indirectly educating the public as well. The total attendance of all five locations is over 1,000,000 people a year. The featured displays are interactive, fun as well as educational providing a good medium to promote invasive insect awareness and understanding.

A total of 21 locations were chosen for sampling for this survey season at 17 vineyards in 9 counties of the state as part of a national Grape Commodity Survey. Survey sites were at vineyards, processing locations, or grape growers not associated with a named vineyard. This year’s focus was vineyards or growers that used California root stock and/or use California grape to supplement their own grape production. The following pests were targeted for grape commodity survey: Adoxophyes orana (summer fruit tortrix moth), Autographa gamma (silvery moth), Lobesia botrana (European grape vine moth), and Epiphyas postvittana (light brown apple moth). Traps were monitored every two weeks and insects will be collected for identification.
The survey began in June and finished at the end of August. There were a total of 84 traps in this survey that we monitor every two weeks. All 504 samples collected from the traps were negative for the four target pests.

A total of 8 locations will be chosen for sampling for the 2014 Thousand Canker Disease Survey. Six survey sites were located in or near transportation corridors, public lands, and state and county parks radiating from the New Hope area. There are two sites located in Morris County at Spruce Run and Ringwood State Parks. The following pest will be targeted for Thousand Canker Disease survey; Pityophthorus juglandis (walnut twig beetle), with vectors Geosmythi amorbida. Traps will be monitored every two weeks and insects will be collected for identification.

A total of 96 traps were sampled from 8 locations in New Jersey. All samples were sent to Rutgers Diagnostic laboratory for identification and were negative for Pityophthorus juglandis. We did trap Pityophthorus liquidambarus in traps along the Delaware River. Pityophthorus liquidambarus is a pest on sweet gum and is not known to occur in New Jersey.

Traps were set at 10 companies by Division staff at 10 locations in Union, Middlesex, Hudson and Essex Counties for the 2014 Khapra Beetle Survey. The companies selected for the survey were spice importers, processors or used burlap bag distributors, all of which are potential pathways for the establishment of Khapra beetle in New Jersey. There were 60 traps in total that were deployed. Each trap was monitored every two weeks for a total of twelve weeks. All 360 trap catches were negative for Khapra beetle (Trogoderma granarium).

**SEED CONTROL**

In 2014, a total of 104 samples of seed were submitted to the Division of Plant Industry’s Seed Laboratory for analysis. Forty-two percent of these samples collected for regulatory purposes were analyzed to determine seed quality and germination rates. Emphasis for sampling and testing was placed on agricultural crop seed, commercial vegetable seed and turfgrass seed.

In order to monitor agricultural seed sold through farm supply outlets, 44 lots of vegetable seed were inspected and sampled in 2014 for quality control analysis prior to being used by farmers. In addition, 10 lots of field crop, 21 lots of turfgrass and 27 lots of native plant seed were sampled from wholesale distributors and growers.

This seed was analyzed for germination and purity. Laboratory testing of these lots found that all samples germinated at or above the percentages listed on the label and were free of any noxious weed seeds. The general quality of vegetable seed sold in New Jersey directly to farmers is excellent and is accurately labeled.

**SEED CERTIFICATION**

A total of 13 turf seed samples were taken from lots of certified turf seed shipped to
New Jersey from other states. These samples, which represented 82,000 pounds of certified turf grass seed, were tested to determine eligibility for the interagency certified seed program. Certification program staff supervised the mixing of 14,400 pounds of high quality turf seed. New Jersey sod growers used this seed to produce a high quality sod product. In addition, 8 lots of non-certified turf seed, representing 22,900 pounds of seed, were sampled and tested for other New Jersey seed dealers.

Division of Plant Industry staff also certified 46 acres of conservation plant material developed at the USDA NRCS Cape May Plant Materials Center. This stock is used primarily for coastal soil stabilization. Because of the important role this soil conservation plant material plays in coastline stabilization, the demand for plants to replant established sand dunes continues to remain high.

PLANT LABORATORY SERVICES

The Plant Laboratory Services unit provides laboratory support for regulatory inspection, plant certification and insect rearing programs of the Division of Plant Industry. Germination, purity, vigor and noxious weed examinations are performed on seed submitted to the laboratory.

Routine sampling of seed offered for sale assures farmers that seed will perform at the germination percentages specified on the seed labels under ideal conditions. Some seed lots do not germinate and perform well when planted in the field early, and conditions are less than optimal. Low vigor seed could have a disastrous financial impact on growers.

Vigor testing of seed, conducted by the Plant Laboratory upon request, provides valuable information to the farmer to better manage planting times as well as growing and storage conditions. Growers of sweet corn, beans, spinach, parsley, and peppers find these tests extremely beneficial to their operations. In 2014, a total of 28 tests for vigor were conducted for growers of sweet corn.

Leaf tissue samples were collected from blueberry and cranberry mother plants for blueberry scorch virus testing. Blueberry scorch is the leading disease in New Jersey blueberries. A total of 5,074 samples representing approximately 50,740 mother plants were tested by Enzyme Linked Immunosorbent Assay (ELISA) for this virus. A total of four growers in two counties were tested. All samples were negative for this disease.

The Plant Laboratory tested stone fruit material collected by Division staff to be tested for plum pox virus, tomato ring spot virus, and necrotic ring spot virus. Leaf samples were collected and tested from a stone fruit nursery. A total of 324 samples were collected and submitted for ELISA testing by the Division’s Plant Laboratory. All samples were negative for plum pox, tomato ring spot, and necrotic ring spot. Plum pox has not been detected in New Jersey.

The Laboratory supported the Apiary Inspection program through the analysis of bees for Varroa mites and Nosema spores. Nosema is a microsporidia with possible links to
colony collapse disorder. 158 samples from 45 different beekeepers were analyzed with some hives being sampled multiple times throughout the year. Hives that were repeatedly sampled had results tracked and graphed to observe seasonal trends in infection levels.

**Sirex woodwasps** (*Sirex noctilio*) are an invasive species of insect, which can cause severe damage to pine wood and pine forests. Areas in Australia and South America have had success using nematodes (*Deladanus siricidicola*) as biological control agent against this forest pest. These nematodes parasitize Sirex wasps and prevent the female wasps from laying eggs, causing her to instead spread the nematode eggs. Colonies of these nematodes are being maintained by the Plant Laboratory for use in the event of a Sirex infestation in New Jersey pinelands.

Mycotoxin fungi can be potentially dangerous to humans and animals if they produce toxins in significant quantities on feed and plant materials. The Division of Plant Industry’s Plant Laboratory has set up a protocol to screen and quantify the concentration of aflatoxin and ochratoxin using high performance liquid chromatography (HPLC). Plant materials are tested prior to use for prevention of possible illnesses, such as kidney disease, liver disease, and cancer. ELISA tests can also be used to screen for additional mycotoxins.

**AGRICULTURAL CHEMISTRY**

The Agriculture Chemistry program entered its second year of implementation in 2014. The objective of the Agriculture Chemistry program is to provide laboratory support for regulation of fertilizer/soil conditioner and pet food. Commercial fertilizer, soil conditioner, and pet food that are for sale and distributed in New Jersey must be sampled and analyzed to ensure sufficient nutrient quantity.

During 2014, the Agriculture Chemistry program received a total of 237 regulatory fertilizer samples. The Agriculture Chemistry program documented and ground all of the samples to prepare for tests on the following label claims for N, P, K, Ca, Mg, S, Zn, Cu, Fe, Mn, B, and Mo. The program prioritized its testing on samples that were taken from farmers. This modification in sample testing decreased the turnaround time of providing official tests to less than 5 business days, significantly serving farmers by promptly returning fertilizer inspection reports. A total of 213 fertilizer samples were tested in-house for about 1,100 items. There were 58 fertilizer samples identified to be deficient and another 44 that received official warnings. Official inspection reports and penalty assessment letters were issued through the Division of Marketing and Development. The fertilizer chemistry program also significantly decreased testing costs to farmers with this in-house testing.

During 2014, a total of 375 pet food samples were collected, documented, ground and analyzed. A total of 32 pet food samples were analyzed for protein and crude fat. All of them were in conformance with their label claims. New Jersey’s pet food chemistry program is participating in the AAFCO Performance Test program.
The Agriculture Chemistry program reviewed 7 new fertilizer license applications, which followed the AAPFCO labeling protocol. New applicants received scientific advice from control officers to ensure that the fertilizer applications conform to the New Jersey fertilizer law, in particular, the newly implemented fertilizer application regulation. The Agriculture Chemistry program recommended the approval of these applications to the Division of Marketing and Development.

MEDICAL MARIJUANA

The Compassionate Use of Medical Marijuana was officially implemented in the state in 2012. The Plant Laboratory entered a cooperative effort with the New Jersey Department of Health and Senior Services to test for mycotoxins in medical marijuana samples. A total of 28 composite samples were tested in 2014 for both aflatoxin and ochratoxin on this effort with no positives to report.

FOOD EMERGENCY RESPONSE NETWORK PERFORMANCE TEST

The Plant Laboratory is a member of the Food Emergency Response Network (FERN). The purpose of the FERN Performance Test program is to examine its member laboratory capability to rapidly detect chemical, biological, and radioactive compounds as a response to food terrorism. The Plant Laboratory participated in two performance tests (PT) in 2014 administered by the FDA, to review the member laboratories’ performance. One PT was Melamine detection in dried whey protein concentrate. A total of 34 laboratories participated in the PT tests and 76% of the laboratories submitted satisfactory results for all 8 samples. New Jersey Plant Laboratory was one of them, using an in-house developed method. The second was to examine one pesticide (monocrotophos) and two alkaloids (strychnine and scopalamine) in 8 ground turkey samples with GC/MS or LC/MS. The laboratory managed to develop an alternative method with current resources. The results reported by the laboratory completely agree with the designated PT values.

BIOLOGICAL CONTROL OF PLANT PESTS

Under the Division of Plant Industry’s Biological Control Program, beneficial parasitoids and predators are laboratory reared for release into the field to control agricultural and forest pests, as well as to protect the state’s natural resources and other open lands. The release of beneficial insects reduces the need for pesticides, reduces the amount of pesticide residue in the environment and minimizes pest resistance to chemicals. The reduction of pesticide applications in the field also allows the native beneficial insect populations to increase, adding more pressure on the pest populations.

During 2014, the Division of Plant Industry conducted seven biological control programs designed to establish new beneficial species in the state, reduce pest populations in certain crops, monitor pest populations to determine impacts, and gather baseline data for new biological control programs. Previously established beneficial insect populations are also monitored and evaluated to plan for the augmentation of these populations. All of these programs required laboratory rearing of beneficial insects for release into the
field. The goal is to reduce or maintain New Jersey pest populations below economic levels.

The Mexican bean beetle (MBB), *Epilachna varivestis*, biological control program involves the mass production and release of small beneficial wasps, *Pediobius foveolatus*, to control MBB. The Mexican bean beetle feeds on snap bean, lima bean and soybean foliage. The imported wasps, known as parasitoids, attack and kill MBB larvae. The exotic parasitoids cannot over-winter in New Jersey, and must be reared in the laboratory and released into the field each summer.

A total of 242,000 adult *P. foveolatus*, were released into 42 monitored soybean sites during the 2014 soybean growing season. Additional soybean, lima bean and organic farm field releases totaling 211,500 parasitoids were made to keep pressure on Mexican bean beetle populations. Thus, during the 2014 season a total of 453,500 *P. foveolatus* were released statewide. There were no reported insecticide treatments for Mexican bean beetle in soybeans in 2014.

New Jersey farmers planted over 100,000 acres of soybeans in 2014. Approximately 80% (80,000 acres) of the total acreage was susceptible to feeding damage by the Mexican bean beetle. The parasitoid release program has been so successful in reducing MBB populations that no pesticide applications have been required on soybean acreage since 1993. In 2014, these savings amounted to more than $1,300,000 in reduced pesticide costs. This program receives financial support from the New Jersey Soybean Board.

Under a cooperative agreement with the USDA Forest Service (USFS), the Division of Plant Industry’s Phillip Alampi Beneficial Insect Laboratory (PABIL) began work in 2007 with *Laricobius nigrinus*, a Derodontid beetle predator of Hemlock Woolly Adelgid (HWA).

In 2014 *L. nigrinus* beetles were recovered from the Delaware Water Gap northward to the state line, which is approximately 34 miles. The beetles were also recovered 33 miles westward into Pennsylvania. This suggests that *L. nigrinus* has firmly established itself in the state, despite the effects of the polar vortex which reduced the hemlock woolly adelgid population. The beetles have dispersed very well and are likely having an impact on the hemlock woolly adelgid population.

Purple loosestrife, *Lythrum salicaria*, the invasive exotic freshwater wetland plant, had been displacing the native flora in wetlands and threatening many animals that depend on these plants for survival. Large monotypic stands of this plant have the capacity to reduce ground water recharge, decrease water storage capacity of a wetland, reduce the marsh’s ability to attenuate floods, reduce open water space, reduce species diversity, and jeopardize the health and vitality of the marsh ecosystem. Until recently, the only methods of control were chemical, physical or mechanical, all of which are expensive, temporary and often impact non-target species.

The Division of Plant Industry’s Phillip Alampi Beneficial Insect Laboratory (PABIL)
continues to mass produce and monitor two foliage feeding beetles of purple loosestrife, *Galerucella pusilla* and *Galerucella calamiensis*.

In 2014, Division staff released 45,625 *Galerucella spp.* statewide. Since the initial releases in 1997, over two million beetles have been released at 115 sites in 18 New Jersey counties. *Galerucella* has been recovered from all of these monitored sites.

All sites showed signs of purple loosestrife stress and collapse. Plants at these sites are a full meter shorter than they were when the releases started and the purple loosestrife is no longer the dominant species in the wetland. There is greater diversity of plant species in New Jersey wetlands versus the virtual monoculture of purple loosestrife observed in the 1990’s. *Galerucella spp.* have been recovered at 98 non-release sites since 2002 with one recovery made 31.5 miles away from the closest release site made in 2008.

In addition, releases have been made at a number of sites, including National Park Service lands and sites managed by Natural Lands Management, The Nature Conservancy of New Jersey, Mercer County Park Commission, Union County Park System, Allentown Borough, Rider University, Rutgers University, property managed by the New Jersey Meadowlands Commission, a number of mitigation sites and private landowner properties. Since 1997, more than 1 million beetles have been shipped to cooperators in Maine, Massachusetts, Rhode Island, New York, Delaware, Pennsylvania, Tennessee, Michigan and New Hampshire to support their weed suppression programs.

In 2004, the Beneficial Insect Laboratory entered into a cooperative effort with the US Forest Service and the University of Delaware, to develop mass rearing techniques for *Rhinoncomimus latipes*, a host specific weevil collected in China that is a predator of the exotic invasive plant, mile-a-minute (MAM), *Persicaria perfoliata*.

Since initially receiving the beetles from the University of Delaware, PABIL has made tremendous progress in understanding the requirements necessary to produce this *R. latipes* and its host, *Persicaria perfoliata*, allowing for the mass production of weevils for releases in the state and shipments to cooperators in other states.

The Beneficial Insect Laboratory’s production capacity reached a sustained level of more than 2,000 new weevils emerging each week, with more than 11,600 phytophagous weevils released in New Jersey in 2014 and an additional 50,000 weevils shipped to USDA/APHIS/PPQ and Forest Service cooperators in Delaware, Pennsylvania, West Virginia, New York, Rhode Island, Massachusetts, Connecticut, Virginia, North Carolina and Maryland.

During 2014, *R. latipes* weevils became established and were recovered from 100% of the release sites. Field evaluations of all release sites showed decreased cover and seedling numbers. Since 2005, the beneficial weevils have been recovered from 236 non-release locations. Generally, there are no mile-a-minute sites in the state that do not have weevils or exhibit evidence of their feeding.
In New Jersey, a native pest, tarnished plant bug (TPB), *Lygus lineolaris*, is often observed in alfalfa, but seldom causes economic damage to this crop. However, large numbers of TPB can cause significant damage to stone fruit, strawberries, and many other plant species of economic importance.

In 2001, the Phillip Alampi Beneficial Insect Laboratory received an exotic European parasitoid, *Peristenus relictus* from the USDA, Beneficial Insect Research Laboratory, in Newark, Delaware to investigate the feasibility of utilizing it as a biological control agent for TPB. With the development of an inexpensive, high quality TPB diet by researchers at the USDA, ARS Biological Control and Mass Rearing Unit, Mississippi State University, the potential to rear tens of thousands of host TPB nymphs in the laboratory has made it possible to significantly increase parasitoid production.

In 2014, a total of 21,500 *P. relictus* were released into alfalfa and fallow fields in Cumberland and Salem Counties. However, no recoveries were made. Although no *P. relictus* were recovered, several *P. digoneutis*, another solitary parasitoid that has been previously established in the northern part of the state in the 1980’s by the USDA, were recovered.

With the increasing threat of mosquito-borne illnesses such as West Nile virus and eastern equine encephalitis that affects humans and economically important animals, the Phillip Alampi Beneficial Insect Laboratory cooperated with the New Jersey Department of Environmental Protection (NJDEP), Office of Mosquito Control Coordination, to develop a *biological control program for mosquitoes* that breed in standing fresh water. Copepods, which are nearly microscopic crustaceans, are efficient mosquito larvae predators. At the request of the New Jersey Department of Environmental Protection (NJDEP), Office of Mosquito Control Coordination, PABIL established cultures of various native species of copepods, and evaluated procedures for mass-production.

Beginning in 2005 the Alampi Laboratory collected and established cultures of copepod species native to New Jersey. Having concurrently developed a mass production method for copepods and their associated food organisms and the intention of starting field trials, the Division of Plant Industry focused on the mass culture of the predatory copepod, *Macrocyclops albidus*, a species successfully used to control mosquitoes in discarded tires and other containers in subtropical climates as well as in Louisiana.

In cooperation with NJDEP’s Office of Mosquito Control Coordination and the Mosquito Control Commissions of Ocean, Burlington, and Morris Counties, large field release trials in diverse habitats were conducted. It was hoped that these trials would provide valuable information on the logistics of transporting, releasing, and monitoring copepods, and provide information on the rate with which copepods can build their populations and suppress mosquitoes in diverse situations. More than 30,000 *M. albipes* were released in New Jersey in 2014.
Summary of FY 2014-15 Activities

Plant Inspection and Licensing

The Division of Plant Industry through the administration of Article 14 of the Agriculture and Markets Law is responsible for maintaining and safeguarding plant health in New York State. Through regulation and routine inspections of the horticultural industry including timber products and other agricultural crops, invasive plant pests and pathogens are kept in check. During the course of these inspections, inspectors look for a variety of different insect and disease problems, including Southern Bacterial Wilt, Boxwood Blight, Sudden Oak Death, and Late Blight of Tomatoes and Potatoes.

In addition to the already established pests, division staff also look for other pests or pathogens that are not known to exist within the state or country. Suspect material is routinely sampled and submitted for analysis. If the findings result in a discovery of a pest that is not known to exist, the material is either quarantined, treated and/or destroyed to safeguard other producers and associated industries.

Division inspectors also work with various industries to inspect outgoing shipments of plant material including lumber, logs, seed, cut Christmas trees, nursery stock, flowers, fruits, and vegetables. This allows New York State to maintain a clean bill of health, supporting the associated industries’ ability to do business nationally and internationally.

Licensing

There were 180,368 acres and 26,155,008 square feet of greenhouse engaged in the production of plant material. There were 750 nursery grower licenses validated through 2014. During this same period 4,654 nursery dealers were licensed.
Inspection

The inspection activities conducted by our Horticultural Inspectors may be summarized as follows:

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<th>Inspection Type</th>
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<td>511</td>
</tr>
<tr>
<td>Shipment Inspections (outgoing foreign)</td>
<td>563</td>
</tr>
</tbody>
</table>

All rejected shipments were destroyed or returned to consignor. These shipments were rejected due to non-viable plants and/or insect/disease issues.

Plant Regulatory and Quarantine Programs

The Division is responsible for four major quarantine programs. Two of these – Asian Longhorned Beetle and Plum Pox Virus - are also eradication efforts and involve significant effort in partnership with various state and federal agencies, municipalities and industry.

Asian Longhorned Beetle Eradication

Highlights

- Due to infested trees found in Melville, Lindenhurst, West Babylon, and Farmingdale outside of the current quarantine boundary, the quarantined area on Long Island expanded from 23 square miles to 51 square miles.

Delimiting Survey and Detection Response

- As an ongoing response to detection of Asian Longhorned Beetle in New York, the areas under quarantine are surveyed. All properties must be accessed within the quarantine area and any host trees inspected to complete a cycle. The survey protocols require that three negative cycles must occur before an area can be considered free from infestation. In 2014, both ground and climbing staff visited a total of 60,408 properties and inspected 184,778 trees.
- Level 3 Survey – In order to insure no other areas of New York are harboring infestation, inspectors work outside the quarantine boundaries on a regular basis, to target and inspect businesses and areas considered at high risk for infestation. The inspectors visited campgrounds, importers, freight rail lines and industrial parks. They accessed 206 establishments and surveyed 2,797 host trees with no new introductions detected.
- Trapping – 24 traps were placed around approved disposal facilities and 4 additional traps were placed within the survey areas. No ALB were found in any of the traps.
- Tree Removal and Detection – 367 infested trees were found in 2014 and 242 trees were identified as high risk. 563 infested and 244 high risk trees were removed. 40 infested and 1
high risk trees were awaiting removal. Since the first detection of ALB in Greenpoint, Brooklyn, a total of 6,916 infested and 12,421 high risk trees have been removed.

Outreach Activities

- The Asian Longhorned Beetle Program continued to place high priority on outreach, education, and training in order to bring awareness and understanding of this destructive pest to the public’s attention.
  - 29 outreach events with information booths staffed
  - 2 scheduled compliance training workshops and 56 on-site compliance trainings were provided; 156 individuals and 62 companies/organizations trained.

Regulatory Activities

- The total area under regulation for ALB is 137 square miles. This is after the expansion of the central Long Island quarantine added an additional 28 square miles to the regulated areas.
- In order to effectively manage and control the movement of wood and insure proper disposal and destruction of host material, the program spends numerous hours training and educating green industry professionals. Once trained and willing to cooperate with the regulations, the companies are issued a compliance agreement where they will inspect all host wood for infestation, and properly dispose of it in an approved manner.
- 1,003 General Compliance Agreements and 17 Nursery/Garden Center Agreements are currently being monitored.
- 3,063 site inspections were made along with 1,043 vehicle inspections. 52 Regulated Material Certificates were issued for firewood inspections. 25 Quarantine Orders and 47 Limited Permits were issued to permit controlled movement.
Asian Longhorned Beetle Research Activities

Research efforts continue in New York, Massachusetts and Ohio, some conducted over several years. Much of the research has had a positive impact on ALB program activities and has assisted program managers in developing better survey and treatment methods.

- Program staffers assisted the University of Vermont in a sentinel tree research project. Twenty *Acer mono*, (a favorite tree of Asian Longhorned Beetle in China) were deployed in groups of five at predetermined distances from infested trees. The trees were checked and watered weekly during ALB flight season. The research proposed that *Acer mono* would serve as a strong attractant to the beetle. During the three month period when the trees were in place there were no detections of ALB on any of the trees.

- A multi-state research project to determine the chipping standards needed to eliminate the risk of Asian Longhorned Beetle spread is currently under way. Researchers from the USDA CPHST Lab in Otis, Massachusetts have collected ALB infested bolts of wood from the New York, Ohio and Massachusetts programs. Using standard industry wood chippers, the infested wood will be chipped and larva collected to determine the survival rate within various sizes of wood chips. The New York program is presently using the Emerald Ash Borer (EAB) wood chip standard of 1” in 2 dimensions.

- In order to further the goal of early detection of the Asian Longhorned Beetle, the NY ALB program deployed twenty–seven black panel traps with a combination of pheromone lures recommended by the USDA CPHST lab in Otis, Massachusetts. The traps were placed in and around ten approved disposal sites for ALB wood waste and on the outskirts of the expanded quarantine area in Central Long Island. The traps were deployed on July 1st and checked bi-weekly with lures changed as needed. The traps were removed on August 31st with no detections reported.

**Golden Nematode Containment Quarantine**

The Golden Nematode (*Globodera rostochiensis*) (GN) is a quarantined pest that has been discovered in potato fields on Long Island and in the Finger Lakes region in upstate New York. It is recognized throughout the temperate regions of the world as one of the most difficult of all crop pests to eradicate. It can drastically reduce yields on the farms where it exists, and if left uncontrolled, poses a threat for spread to other fields.

Were it not for an effective management plan, the unmitigated risk of spread could prohibit the interstate movement of all crops which could carry soil on them. For over sixty years, the Department and the United States Department of Agriculture have worked cooperatively to preserve the potato industry in New York and to prevent the spread of the nematode.

In order to prevent the spread of GN, vigilance needs to be maintained over mandated sanitation practices and the adherence of the grower to the resistant variety rotations. The Agriculture and Markets Law requires that any equipment leaving a regulated field be cleaned free of all soil prior to entering a non-regulated field and any grower wishing to plant potatoes in a regulated field must follow
a four-year crop rotation scientifically designed to reduce the spread of GN cysts. Inspectors monitored grower activities to ensure that mandated sanitation practices were employed. In 2014:

- Inspectors sanitized 1,744 pieces of equipment and issued 93 certificates of disinfestation.
- USDA inspectors issued 6 phytosanitary certificates for equipment leaving the state.
- Collected 156 potato leaf samples from 52 fields for DNA analysis to confirm variety planted.
- Two fields, through DNA analysis were found to have been planted out of the required rotation.
- The grower involved was notified of the potential violation on these fields.

On an annual basis the GN and PCN statewide soil survey is conducted by USDA with Division assistance. This survey is to determine if there are any active infestations both in regulated fields, fields likely to be exposed to infestation, potato seed land and non-exposed land. For 2014, a total 5,166 soil samples were collected from 2,016 acres in 15 counties. There was a detection of one viable cyst on one field. This field had previous positive cyst results. All other samples were negative.

The Department, in collaboration with USDA-APHIS continued to make headway on a five-year plan where the goal is to achieve 90% deregulation of the currently regulated acreage. During the early years of the program, the containment of GN involved quarantining not only infested fields but fields exposed to potential infestation. Based on results of official surveys conducted in 2011 on the soil in the fields and criteria agreed upon by Canada and the U.S., the USDA Animal and Plant Health Inspection Service (APHIS) and the New York State Department of Agriculture and Markets, formerly regulated acreage in Livingston County, Genesee County, and in Steuben County met all requirements for removal from GN regulation, reducing the overall GN quarantine area. Accordingly, restrictions on the interstate movement of GN regulated articles, including root stock and nursery products, from these areas are no longer required.

In the second phase of the five-year plan, inspectors completed the review of the areas under quarantine in Orleans, Nassau and Western Suffolk Counties. The infestation history of each field was reviewed, current status documented and each field mapped. Soil samples of all remaining fields were taken with all returning negative results. Based on survey results and other criteria outlined in the “Canada and United States Guidelines on Surveillance and Phytosanitary Actions for the Potato Cyst Nematodes, Globodera rostochiensis and Globodera pallida,” USDA-APHIS determined that 600,524 acres in Orleans, Nassau, and Suffolk Counties meet all of the requirements for removal from golden nematode regulation. NYSDAM is the process of writing parallel legislation to remove these areas from regulation as well. The revised state quarantine is expected to be in place by early 2015.

There are 222,319 acres still under regulation for the golden nematode in the 3 counties. NYSDAM and USDA Golden Nematode Program staff are currently reviewing all remaining acreage to determine if additional acres are eligible for release.
Plum Pox Virus Quarantine & Eradication Program

Plum Pox is a viral disease of stone fruit species that first appeared in the United States in Pennsylvania in October 1999 and initially in New York in July 2006. Plum Pox Virus (PPV) is vectored by aphids and affects a number of species in the *Prunus* family including peach, nectarine, apricot and plum. This disease is also spread through propagative material – namely budwood of infected material being grafted and grown on.

The New York State Department of Agriculture in cooperation with the USDA and Cornell University is using a multi-tiered approach of survey, control, and education to eradicate PPV from New York. Division of Plant Industry personnel planned, coordinated and conducted the survey for the commercial stone fruit orchards, border survey and woodlots survey this past year.

In 2014 program staff surveyed 1,139 commercial stone fruit blocks totaling 1,072.65 acres in 3 counties for a total of 116,406 leaf samples collected. All samples tested negative using ELISA by the designated lab. A border survey was conducted for the 3rd year in a row by NYSDAM personnel. This was an intense survey of wood lots and homeowner properties along the Niagara River. The target survey area started at Fort Niagara State Park and ran south along the Niagara River to the southern section of Artpark. 1,326 acres were surveyed with 1,506 *Prunus* samples being collected. All samples tested negative using ELISA by the designated lab.
A border survey was conducted again this year by NYSDAM personnel. The location of the border survey was the western boundary of Niagara County that is adjacent to the Niagara River. The Niagara River is between Niagara County, New York and Ontario, Canada. Just across the Niagara River within Ontario, Canada is a tender fruit growing region for Canada. The Plum Pox Virus is known to occur in this region and there is no longer an effort to eradicate the disease from Canada. The presence of the virus this close to our stone fruit growing region puts New York (and the United States) at risk, especially the Niagara County growers. 1,326 acres along the border were surveyed extensively for the presence of susceptible Prunus. A total of 1,506 samples were collected during the 2014 survey. All samples tested negative using ELISA by the designated lab.

NYSDAM conducted a woodlot survey in Niagara County around past positives and sites of concern from commercial growers. A total of 1,487 samples from 832 acres all tested negative by ELISA by the designated lab.

There were no positive finds in 2014 in the orchard, border or woodlot surveys. This is the 3rd year in a row since the initial detection in 2006 that there have been no positives. This enabled the deregulation of Regulated Area A in Niagara County. The Nursery Quarantine remains in effect. This is a significant milestone allowing commercial orchards in these areas to plant Prunus trees. Planting of replacement trees is critical for maintaining peach and other stone fruit orchards.

The Plum Pox Virus Eradication program can reach the goal of eradication within the foreseeable future. Cooperation from growers, land owners and the nursery industry has been critical to the success realized so far.
**EMERALD ASH BORER**

**History**
In 2009 New York State was the 13th state to confirm the presence of emerald ash borer in the United States. On July 23rd 2009 quarantine was placed on Chautauqua and Cattaraugus Counties for Emerald Ash Borer. That quarantine has expanded many time over the last four years. In May of 2013, NYSDAM expanded the area under quarantine again (see map below). USDA-APHIS issued a parallel quarantine to limit the movement of regulated articles both interstate and internationally. Since the expansion in 2013 a total of 22 counties are positive in New York State with a total of 37 counties and 6 partial counties under quarantine.

![Map of Emerald Ash Borer Quarantine](image)

**Emerald Ash Borer Regulatory Activities**
Inspections have been conducted at facilities that handle wood and may be under a compliance agreement. A total of 97 inspections have been conducted at establishments that handle wood products. Inspections were conducted to determine compliance of the emerald ash borer regulations as well as determining if the establishment is following the terms of their compliance agreement.

- Compliance Agreements - 344
  - 137 Mulch/Chip Agreements
  - 108 Transport Agreements
  - 8 Outside Mill Agreements
  - 48 Inside Mill Agreements
  - 2 Firewood Agreements
  - 40 Infested Material Agreements
  - 1 Research Agreement

In addition to inspection of establishments that handle wood products, a total of 1,960 registered nurseries and 1,480 registered nursery dealers were inspected for emerald ash borer. The movement of ash nursery stock poses a significant risk and needs to be continually monitored to ensure compliance. We had one violation of infested firewood being sold. The material was quarantined and destroyed with assistance from NYS Department of Environmental Conservation
**Emerald Ash Borer Outreach Activities:** Outreach is a great complement to our inspection activities. It allows inspectors to interact with large groups of people that are potentially impacted by this pest and its regulations. State inspectors participated in seven meetings to inform various public organizations and industry trade groups about the emerald ash borer regulations and what restrictions are in place to prohibit the artificial spread of emerald ash borer.

**Emerald Ash Borer Management Activities:** In addition to the activities above, inspectors continue to be involved with biological control efforts. USDA –ARS and USDA-CPHST has requested the assistance of the division staff in facilitating release and research of emerald ash borer biological control agents. Three species of parasitoids have been released in six areas New York State and are currently being monitored. The egg parasitoid, *Oobius agrili*, was released in 2012 and 2013 with a total of 14,300 individual parasitoids released. Two larval parasitoids have been released from 2011 through 2013. These releases represent a total of 48,057 *Tetrastichus planipennisi* and a total of 18,240 *Spathius agrili* individual parasitoids released. All of these parasitoids have been recovered in the environs where they were released. This indicates that they are reproducing on their own and feeding on emerald ash borer. No releases were conducted in 2014 at research locations.

**Japanese Beetle Certification**

In 1916 the Japanese Beetle (*Popillia japonica*) was introduced into the Northeast United States and has since spread throughout the State of New York and beyond. This infestation has resulted in many southern and western states enacting quarantines against any infested state (including NY). As a result any shipments of nursery stock or greenhouse material into Category 1 & 2 States must be treated according to the U.S. Domestic Japanese Beetle Harmonization Plan.

New York instituted a sticker program in compliance with the Harmonization Plan in 2010. Several greenhouse growers are enrolled in program and are under current compliance agreement for the use of stickers to certify shipments grown under the conditions of the Harmonization Plan.

New York has one nursery which participates in the Harmonization Plan Appendix 2; Shipment to Category 2 States. Our nursery program follows the protocols set for in the Nursery Accreditation Program for soil sampling for the presence of Japanese Beetle grubs in fall of the year generally the 1st week of October.

**Clean Stock**

The state’s experience with Plum Pox Virus has clearly demonstrated the impact plant diseases can have on the plants and in turn the growers and economy of New York. Planting virus free material is a core best management practice when handling vegetatively propagated plants. This has tremendous significance for our state’s fruit crops which are susceptible to many economically significant viruses.

Grapes are impacted by many such viruses including the Grapevine Leaf Roll associated Viruses (GLRaV). Virus free plants will produce grapes for more years, will have uniform ripening for efficient harvest and will have more consistent brix level (sugar content) to optimize winemaking. New York has regulations in place for a “Voluntary Program for the Production of Virus-Tested Plant Materials” – that has languished and New York has not certified any grape vines under this program for over a decade. New
serological testing methods now available can speed up testing time from 3 years to 2 days. Nurseries have been asking for this program.

Responding to industry demand to revitalize this program the Division of Plant Industry obtained USDA Farm Bill funding under the National Clean Plant Network to modernize and re-implement the Department’s virus certification program. Many grape varieties favorable for the growing conditions of the Eastern United States are not available as virus certified or are not available in the quantities desired. This certification program will fill a need not currently being addressed in the United States. Virus certification is required to export grapes to Canada. There is a significant unmet need for virus certified grape vines in eastern Canada. The certification program will open a new export market for New York grape nurseries.

The impact of this initiative goes beyond New York, the New York grape nurseries are the major grape nurseries located east of the Rockies. They serve the wine and grape industries in New York but also in the northeast (ME, CT, NH, MA and VT), mid-Atlantic (NJ, MD, PA, VA and WV) and mid-west (KS, MN, MI, OH, IL, IN, MO, OK and KY). An active grape certification program in New York will improve the quality of the planting material used in New York and beyond.

New York also has significant participation nationally with the clean stock initiative. Through the National Clean Plant Network (NCPN) New York has six members on the Grape Subgroup including 2 nurseries, 1 winery, 1 researcher, 1 Extension and 1 regulator (Margaret Kelly, Assistant Director of the Division of Plant Industry). As the third largest grape producing state and the largest producer of grape nursery stock in the East this is a very appropriate role for New York’s economic interests. The Division also draws upon and shares information with the other NCPN commodity groups including fruit tree, hops and berries.

**Apple Certification for Shipments to AZ and CA**

The States of Arizona and California renewed the Master Permits authorizing the shipment of 12 brands of fresh apples commercially grown in New York during the 2013 growing season to their respective states. Twenty-two establishments within New York have been approved for participation in the 2013 program. An additional eleven establishments have Apple Gift Pack Certification.

**Commodity Inspection, Sampling and Analysis**

**Seed Inspection, Sampling and Certification (A&M Law, Article 9)**

Farmers depend on seed purity, germination, trueness to variety and freedom from weed seeds to produce maximum crop yield and profitability. Each year, the Division receives a number of consumer complaints and inquiries regarding seed quality. Agriculture and Markets Law recognizes this fact and provides for the inspection, sampling and analysis of seed that is offered or exposed for sale in New York. The unchecked introduction of noxious weed seed is also a concern of importance.

The Division works closely with Cornell University’s New York Seed Improvement Project to certify seed as New York State Certified. The designation of seed as certified indicates that it is of a known variety produced under strict standards to maintain varietal purity. Seed lots must also meet specified standards for other crop seeds, inert matter, weed seeds and germination.
In 2014, 543 samples were taken with 369 found in compliance to their labeling. 83% of the samples were found to be accurately labeled. Approximately 75 seed labelers were sampled. Data as of 1-12-15

<table>
<thead>
<tr>
<th></th>
<th>Turf/Lawn Seed</th>
<th>Ag Seed</th>
<th>Flower Seed</th>
<th>Vegetable Seed</th>
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<tr>
<td>Samples Analyzed</td>
<td>143</td>
<td>354</td>
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<tr>
<td>Samples in compliance with labeling</td>
<td>85</td>
<td>250</td>
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<tr>
<td>Samples void/pending</td>
<td>27</td>
<td>63</td>
<td>n/a</td>
<td>9</td>
</tr>
<tr>
<td>Samples with Violations</td>
<td>31</td>
<td>41</td>
<td>n/a</td>
<td>3</td>
</tr>
</tbody>
</table>

Seed found in violation of its labeling in 2014:
- was relabeled with the New York State Seed Testing Laboratory analysis.
- pulled from distribution.
- the labeler may receive a penalty for distributing mislabeled seed.

**Fertilizer, Lime & Soil and Plant Inoculants (Article 10, 9A, 10A)**

Proper soil pH and crop nutrition is vital in maximizing crop yields. The guaranteed analysis of the chemical composition of fertilizer and liming products is critical for farmers in maximizing profitability and in their whole farm management efforts to minimize environmental impacts. Agriculture and Markets Law Articles 9A, 10, and 10A provide the statutory guidance for licensing, inspection, sampling and analysis to ensure the availability of high quality and properly labeled materials.

In 2014, 94 commercial fertilizer samples were obtained for analysis and comparison to their labeled guarantees. Seventy percent of the fertilizer products sampled were found to be compliant to their stated guarantees. In addition, 14 agricultural liming materials were also sampled for analysis.

<table>
<thead>
<tr>
<th></th>
<th>Fertilizer</th>
<th>Liming Materials</th>
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</thead>
<tbody>
<tr>
<td>Firms Licensed</td>
<td>396</td>
<td>89</td>
</tr>
<tr>
<td>Inspections Performed</td>
<td>329</td>
<td>142</td>
</tr>
<tr>
<td>Samples Taken</td>
<td>96</td>
<td>14</td>
</tr>
</tbody>
</table>
Notice of sample results were mailed to all distributors of fertilizer and lime products that were tested.

Fertilizer found in violation of its labeling in 2014:
- Was relabeled with NYSDAM Food Lab analysis, or
- Pulled from distribution, or
- Compensation by the labeler made to the purchaser (bulk sampling on the farm) for deficiency, or
- Referral to Counsels Office with penalty recommendation

**Ammonium Nitrate Inspection**

The potential of use of commercial fertilizers, particularly ammonium nitrate and anhydrous ammonia, in the production of weapons of mass destruction and in the illegal manufacture of drugs has heightened concern with respect to their regulation and onsite security. Any person or entity in New York State that sells, offers for sale, or otherwise makes available, ammonium nitrate or regulated ammonium nitrate materials is required to register annually with the Department. All purchasers must provide proper identification and background information before purchasing ammonium nitrate or ammonium nitrate products. All sales records must be retained for a 2 year period and be available for inspection by the New York State Department of Agriculture and Markets or New York State Office of Homeland Security. Ammonium nitrate and ammonium nitrate materials must be stored in a secure location. Daily inspections by the establishment operators for attempted entry, vandalism and structural integrity are required. There are currently 10 establishments registered as ammonium nitrate retailers. Ammonium nitrate retailers in state are subject to quarterly inspections by NYS Horticultural Inspectors. All with facilities in the state were inspected and found to be in compliance with the regulations.

**Stop Sale Orders and Non-Compliance Issues**

52 Stop Sales on products/distributors were issued at approximately 24 facilities.
- Approximately 35 Stop Sale Orders were issued for seed found for sale past the expiration date.

**Integrated Pest Management**

The mission of the New York State Integrated Pest Management (IPM) Program is to develop and deliver sustainable ways to manage pests that are cost-effective and pose minimal risks to human health and the environment. The program focuses on IPM strategies that address a wide range of plant and animal pests including arthropods, crop diseases, weeds and vertebrate pests through programs of implementation and development/research.
The IPM Program is critical to the development and implementation of economically and environmentally sustainable tactics for farmers to manage annually recurring insect, weed, disease and vertebrate pests, as well as new invasive species and those that have become more difficult to control due to development of resistance to pesticides.

The 2014/15 allocation for the Statewide Integrated Pest Management Program conducted through the New York State College of Agriculture and Life Sciences at Cornell totaled $500,000. Cumulative appropriations for this publicly supported program have amounted to $23,572,874 over a 30 year period since its inception in 1985.

During this period of sustained support, approximately 1,065 research and development, demonstration and implementation projects have been funded in the areas of fruit, vegetables, ornamentals and turf, and dairy/field crops. The emphasis of funding continues to be in the area of bio-intensive studies and implementation projects.

**Invasive Species and Noxious Weeds**

Following enactment of New York’s Invasive Species law, the Department of Agriculture and Markets (DAM) and the Department of Environmental Conservation (DEC) were given a September 1, 2013 deadline to develop regulations to implement the new law.

As part of the rulemaking process, DAM continued doing socioeconomic assessments for those species that ranked very high and high for ecological invasiveness. These are the species that have been included in the initial rulemaking – including 76 plant species. For the most part, the species that are listed in the initial rulemaking are listed as prohibited, with the exception of Norway Maple (Acer platanoides), Japanese Virgin’s Bower (Clematis terniflora), Burning Bush (Euonymus alatus), Winter Creeper (Euonymus fortunei), Chinese Silver Grass (Miscanthus sinensis), and Black Locust (Robinia pseudoacacia). These six species are listed as regulated, meaning they can still be sold, but with conditions. And finally, Japanese Barberry (Berberis thunbergii) is listed as prohibited with a one-year grace period to allow for the management of existing stock.

DAM and DEC held four hearings across the state to receive public comments on the proposed regulations – in addition to the comments that were submitted electronically.

The agencies reviewed the comments received and prepared responses to comments. The regulations were adopted in the fall of 2014 and go into effect on March 10, 2015. The Division of Plant Industry and the NYSDEC Invasive Species Unit have contributed to the development of outreach materials and engaged in a proactive education and outreach program to help the affected industries understand the regulations and work towards compliance.
Pest Survey

The primary objective of the CAPS program is to establish and maintain a comprehensive network of cooperators and stakeholders to facilitate our mission and to safeguard American plant resources. NYSDAM is committed to survey and detection of exotic plant pests that may threaten the agriculture of New York State and the continental United States. NYSDAM pest detection objectives and goals parallel those identified in the 2014 National CAPS Guidelines emphasizing commodity surveys for the early pest detection of non-indigenous plant pests and confirming the presence or absence of plant pests impacting domestic and international movement of New York plants and plant products.

Our objective is the early detection of the following insect pests and pathogens in high-risk import nurseries/greenhouses and garden centers/retail outlets which are potentially harmful to New York agriculture/horticulture. These pests and pathogens are located within the Nursery/greenhouse and Retail garden center Commodity (NRC) Bundled Survey:

**Nursery/greenhouse and Retail garden center Commodity Survey (NRC):**

The 2014 Nursery/Retail Commodity Survey was conducted by 15 NYS Department of Agriculture Horticultural Inspectors in three regions throughout New York State. This survey focused on detecting exotic terrestrial plant pests at wholesale and retail greenhouses, landscape nurseries, and retail outlets/garden centers. Surveys for target pests began January 2014. There are four target pests surveyed for using traps and lures: European Hardwood Ambrosia Beetle, Golden Twin Spot Moth, Japanese Pine Sawyer, and Oak Ambrosia Beetle. There are six target pests surveyed for using visual survey methods: Boxwood Blight, Japanese Wax Scale, Late Blight, *P. ramorum* Blight (aka: Sudden Oak Death), Southern Bacterial Wilt, and Chili Thrips. Suspect insect targets collected were sent to the Insect Diagnostic Laboratory at Cornell University for identification. Suspect disease specimens collected were sent to the Northeast Plant Disease Diagnostic Lab at Cornell University. All surveys have concluded and traps have been removed.

New York CAPS Targets 2014 Summary

- **Ceroplastes japonicus** – Japanese Wax Scale
- **Cylindrocladium pseudonaviculatum** – Boxwood Blight
- **Phytophthora infestans** – Late Blight on Tomato
- **Phytophthora ramorum** – *P. ramorum* Blight (Sudden Oak Death)
- **Ralstonia solanacearum race3 biovar2** – Southern Bacterial Wilt
- **Scirtothrips dorsalis** – Chilli Thrips
- **Trypodendron domesticum** – European Hardwood Ambrosia Beetle
- **Chrysodeixis chalcites** – Golden Twin Spot Moth
- **Monochamus alternatus** – Japanese Pine Sawyer
- **Platypus quercivorus** – Oak Ambrosia Beetle
Through visual inspection of nursery stock at nurseries/greenhouses and garden centers/retail outlets:

### Summary of 2014 Annual Accomplishments

<table>
<thead>
<tr>
<th>Federal Target Species</th>
<th>Survey Dates</th>
<th>Est. # Sites for 2014</th>
<th>Actual Sites</th>
<th>Est. # Plants Inspected</th>
<th>Actual Plants Inspected</th>
<th>Potential Collections</th>
<th>Specimens Collected</th>
<th>Positive Identifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Japanese Wax Scale, <em>C. japonicus</em></td>
<td>Jun – Sept</td>
<td>150</td>
<td>240</td>
<td>150</td>
<td>38,202</td>
<td>150</td>
<td>1</td>
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<tr>
<td>Late Blight on Tomato, <em>P. infestans</em></td>
<td>Mar – July</td>
<td>150</td>
<td>360</td>
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<td>489,679</td>
<td>150</td>
<td>3</td>
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<td>P. ramorum Blight, <em>P. ramorum</em></td>
<td>Mar – Aug</td>
<td>68</td>
<td>303</td>
<td>68</td>
<td>91,948</td>
<td>68</td>
<td>18</td>
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<tr>
<td>Southern Bacterial Wilt, <em>Ralstonia solanacearum race3 biovar2</em></td>
<td>Jan – Mar Sept – Dec</td>
<td>150</td>
<td>429</td>
<td>150</td>
<td>1,438,833</td>
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<td>Chilli Thrips, <em>S. dorsalis</em></td>
<td>Apr – Jul</td>
<td>150</td>
<td>401</td>
<td>150</td>
<td>958,972</td>
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<td><strong>Annual Totals</strong></td>
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<td>2,035</td>
<td>818</td>
<td>3,072,124</td>
<td>818</td>
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Through pheromone trapping in nursery stock at nurseries/greenhouses and garden centers/retail outlets:

<table>
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<tr>
<th>Federal Target Species</th>
<th>Survey Dates</th>
<th>Est. # Sites for 2014</th>
<th>Actual Sites</th>
<th>Est. # Trap/Site Servicing</th>
<th>Actual Traps/Servicings</th>
<th>Potential Collections</th>
<th>Specimens Collected</th>
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<td>European Hardwood Ambrosia Beetle, <em>T. domesticum</em></td>
<td>Mar – June</td>
<td>15</td>
<td>15</td>
<td>30/180</td>
<td>30/180</td>
<td>180</td>
<td>1,955</td>
<td>0</td>
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<tr>
<td>Golden Twin Spot Moth <em>C. chalcites</em></td>
<td>Mar – May</td>
<td>15</td>
<td>15</td>
<td>30/180</td>
<td>30/184</td>
<td>180</td>
<td>323</td>
<td>0</td>
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<tr>
<td>Japanese Pine Sawyer <em>M. alternatus</em></td>
<td>Jun – Aug</td>
<td>15</td>
<td>15</td>
<td>30/180</td>
<td>30/188</td>
<td>180</td>
<td>2,722</td>
<td>0</td>
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<tr>
<td>Oak Ambrosia Beetle <em>P. quercivorus</em></td>
<td>Jun – Sept</td>
<td>15</td>
<td>15</td>
<td>30/180</td>
<td>30/178</td>
<td>180</td>
<td>2,256</td>
<td>0</td>
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<tr>
<td><strong>Annual Totals</strong></td>
<td></td>
<td>60</td>
<td>60</td>
<td>120/720</td>
<td>120/730</td>
<td>180</td>
<td>7,256</td>
<td>0</td>
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</table>
2014 Farm Bill Survey Summary Report

Stone Fruit Commodity Survey

A survey was conducted of stone fruit orchards outside the existing quarantine (Niagara, Orleans and Wayne Counties) for Plum Pox Virus (PPV). Counties were selected based on risk for having PPV looking at distance from previous positive detections in adjacent New York counties and Ontario, Canada. 13,909 samples were collected from 4 counties (Chautauqua, Monroe, Ontario & Seneca) all samples tested negative.

Trapping was conducted for the Plum Fruit Moth (Grapholita funebrana). 10 Wing traps with the appropriate lure were placed in 2 counties (Monroe & Ontario), traps were monitored throughout the season. Twenty seven (27) moth specimens were collected for determination. No specimens determined to be Plum Fruit Moth.

Phytophthora ramorum National Nursery Survey

A survey was conducted of nurseries that were determined to be high-risk based on the volume of host material each received from the west coast. The survey was conducted from May through August, 2014 and consisted of water baiting in bodies of water and by using the bottle of bait method, soil sampling and leaf sampling at high-risk nurseries across the state. All host materials that were identified as positive for P. ramorum and any high-risk host plants in proximity of positive host material were destroyed following USDA protocols. Additionally, an environs survey was conducted around nurseries that had previous positive plants and water bodies. No positive detections were found within the environs survey.

Grape Commodity Survey

A survey was conducted of grape nurseries and vineyards in the grape growing regions of New York. Nurseries and vineyards were surveyed for:

- *Lobesia botrana* – European Grapevine Moth (GVM)
- *Adoxophyes orana* – Summer Fruit Tortrix
- *Eupoecilia ambiguella* – European Grape Berry Moth
- *Spodoptera littoralis* - Egyptian Cottonworm
- Australian Grapevine Yellows
- **Grapevine Red Blotch associated Virus** (GRBaV)
- Flavescence doree
**Orchard Commodity Survey**

A survey was conducted of apple and stone fruit orchards for:

- *Enarmonia formosana* – Cherry Bark Tortrix (CBT)
- *Epiphyas postvittana* – Light Brown Apple Moth (LBM)
- *Candidatus Phytoplasma mali* – Apple Proliferation Phytoplasma (APP)

**Tomato Commodity Survey**

A survey was conducted of tomato fields for:

- *Tuta absoluta* – Tomato Leafminer (TLM)
- *Ralstonia solanaearum* Race 3 Biovar 2
- *Xanthomonas gardneri*
- Virus symptoms

**Forest Pest Outreach and Survey**

Contracts were initiated with Cornell Cooperative Extensions of Broome, Chautauqua, Essex, Onondaga and Westchester County, to provide assistance to the Department with the 2014 Forests Pests Outreach and Survey Project (FPOSP) in New York to meet the following goals and objectives:

a) Educated public and private individuals and groups through numerous outreach events, on the importance of Asian Longhorned Beetle (ALB), Emerald Ash Borer (EAB) and other forest pests of concern to the State and how to prevent their spread, as well as how to identify adult ALB and EAB signs/symptoms of infestation and what time of year to look for these insects;

b) Conducted workshops aimed at inner-city communities with the message targeted to youth so they are familiar with the signs and damage of ALB and EAB.

c) Engaged public and private individuals to look for and report suspect finds of forest pests though a training session held in Jamestown.

d) Conducted high-risk survey with trained volunteers and NYSDAM inspectors in and around the city of Jamestown. Twenty-three industrial sites were visited with 786 trees inspected. All were found to be negative for signs of ALB, and EAB.

e) Developed ads for the New York State Arborists Association and New York State Nursery and Landscape Association publications.

f) Staffed a booth at the NY State Fair where an estimated 100,000 visitors passed through the Taste of New York tent.
Funding for the FPOSP initiative was secured from the 2013-14 Farm Bill and provided through a cooperative agreement with USDA/APHIS/PPQ.

**Apiary Inspection and Honey Bee Health**

New York State Department of Agriculture and Markets has had a successful year with three seasonal apiary inspectors. The programs they were involved in were as follows:

**Certification**

The inspection and verification of bee diseases is to permit bee operations to travel to other states apparently free of AFB bee disease.

Certification of colonies was done during the active brood production period of 2014. The inspection results are as follows:

- 56 beekeepers entered NYS with approximately 42,546 colonies and 6946 nucs.
- Of the 56 total certificates expected for entry into NYS, only 7 arrived without a certificate.
- This is 12.5% of certificates were not received
- 55 beekeepers exited the state with 35,634 colonies and no recorded nucs.
- 49 beekeepers had been certified by NYS apiary inspection or 89%. The balance traveled on their Florida certificate.
- Of the 35,634 colonies exiting NYS, approximately 12% (4,385 colonies) were examined for American Foulbrood, mite levels and Nosema disease.
- American foulbrood (AFB) level was at 0.0%. No colonies were positive for AFB.
- Varroa mites in colonies were an average of 5% below the economic threshold of three mites per 100 bees for most operations sampled.
• Nosema disease was an average of 2.1 million spores for the five months of sampling and the economic threshold of 1.0 million spores per bee. The last three months of sampling the average spore count was only 1.5 million spores.

• Approximately 84% of the colonies that entered New York State in 2014, exited the state by the end of the year. In previous years this figure is roughly 75%. This increase in colonies exiting the state usually indicates that a large NYS honey crop was produced and that colonies were stronger and healthier to exit the state in the fall.

National Honey Bee Survey (NHBS)

The 2014 survey was named Nosema Disease 2014 and it included New York State’s National Honey Bee survey work. Over the past 5 years this survey work has created a baseline of pest and pathogen levels in the U.S. for honey bees. Three years of pollen samples were taken and a report on pesticide findings from ten beekeepers for each of the three years was done plus a summary report. A major part of the report followed two beekeepers’ colonies (20 colonies for each beekeeper) to monitor Nosema disease and colony strength on a monthly basis for six months.

In 2014, eight colonies per apiary from twenty-four apiaries were sampled. Samples were analyzed for seven viruses, Nosema disease (a parasitic fungal disease), and 3 parasitic mites, including a new mite not known to be present in the U.S. called Tropilaelaps. All sample collections for the NHBS were completed by September 2014. Results of these pests, diseases and pesticides have been received from the USDA Federal bee lab, and will be tabulated in 2015.

Emergency Livestock Assistance Program (ELAP)

A federal program through the 2008 Farm Bill designed to partially compensate beekeepers for their colony losses attributed to Colony Collapse Disorder (CCD). New York State apiary inspectors act as the third party to verify the losses and to report the results to the Farm Service Agency (FSA).

The continuance of ELAP for 2014 was in question at the beginning of last year. However, funding was secured and will be distributed in 2014 for the 2012/2013 season. The information collected by NYSDAM in previous years will be of assistance to NYS beekeepers.

Honey Bee Health Program (HBHP)

This relatively new NYSDAMs program helps beekeepers by closely monitoring varroa mite levels and the fungus disease Nosema and these are harmful to commercial operations. The establishment of Best Bee Management Practices (BBMP) is important in the reduction of yearly colony losses within commercial operations. The result is stronger colonies and additional colonies to pollinate the many U.S. agricultural crops. The purpose of this program is to find solutions to reduce participant’s colony losses, which have been 50% to 80% for the past eight years. This is an ongoing program to find solutions to beekeepers’ bee issues.

This year’s program included commercial beekeepers that had approximately 40,000 colonies. Total colonies tested were 4,385 colonies. An average of 2.84 varroa mites per bees for a five month period and 2.1 million Nosema spores per bee were found.
During the 2014 season focus shifted to include quality and the genetic makeup of the queens in the colonies of honey bees as a factor of colony survival. The progress made in 2013 indicated there was not a significant reduction in the percent of yearly colony losses when Nosema levels and varroa mite levels are reduced and maintained at sustainable lower levels in bee operations. There are additional factors that are weakening and killing large number of colonies of bees beside the Nosema disease and the varroa mite levels.

New information has come to light for 2014’s Nosema disease results. The end result is Nosema disease levels dropped substantially

**Pesticide Assistance**

New York State Department of Agriculture and Markets is assisting the Department of Environmental Conservation with collecting bee samples for pesticide testing. The apiary inspectors determine if the colonies have pesticide issues. The dying and dead bee sample is collected and turned over to the DEC so they can determine through their own lab if and what pesticide has killed the bees.

**Education/Outreach**

This past year the Apiculturist has attended meetings and has given presentations and fielded phone calls from concerned beekeepers.

- Presented at two local bee club meetings.
- Provided two meetings of the Apiary Industry Advisory Committee for 2014.
- Distributed materials to beekeepers pertaining to current apiary issues and disease levels.

**Winter Loss**

Participation in the Bee Informed Partnership National Winter Loss and Management Survey. This survey continues the effort to quantify the colony losses suffered by U.S. beekeepers over the winter season. It is a partnership with the USDA-ARS.

Results are summarized as follows:

- Over all colony loss for NYS was 51% and includes only colonies that over wintered in NYS
- The surrounding Great Lakes states had a range from 42% to 65% for their average losses for 2014-14 winter season.
- NYS hobby beekeepers showed a high loss estimated to an 80% colony loss.

**Cornell Research**

Assisting Cornell with the development of a research project on honey bees in NYS. This project is based on the Analysis of Ten Bee Operations done by the Department of Agriculture and Markets.

**Pollinator Protection Plan** for NYS’s honey bees and other pollinators.

This is the Executive Order of the President of the United States from June 20, 2014. Presentation of the plan was made on November 14, 2014 at the Commissioner’s Apiary Industry Advisory Committee meeting.
Staffing

The Division’s staff levels are currently as follows: 41 permanent field staff, 34 temporary positions supporting ALB eradication, 28 temporary positions support PPV eradication, 6 temporary positions supporting horticultural services, and 3 seasonal apiary inspectors. The Division’s management and support staff number 6 permanent positions with two temporary staff.
MISSION STATEMENT: 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 inspectional programs.

The Bureau of Plant Industry has four divisions. While many of the activities related to plant regulatory activity are housed in the Plant Health and Entomology Divisions, all divisions are represented to some degree in this report:

• **Agronomic and Regional Services** includes the regional inspection staff who are the agents for licensing, inspection, and some pest survey activity.

• **Entomology** is responsible for the detection, delimitation and regulation of invasive and potentially destructive or harmful insect species affecting the agricultural industry in the Commonwealth. The PA Invasive Species Council Coordinator and the State Apiarist work from this Division.

• **Health and Safety** includes the Botany and Noxious Weed Control programs.

• **Plant Health** houses Licensing of Plant Merchants, along with program support for inspection of nurseries and greenhouses and specialized nursery certification programs such as the Fruit Tree Improvement Program. The backbone of the Plant Health Division is a multifaceted plant disease diagnostic laboratory that supports regulatory inspection programs and participates in survey and outreach programs for detection of invasive plant diseases. The PA CAPS Coordinator is housed in Plant Health.
## 2014 By The Numbers: Plant Merchant Licensing:

- 7,800 business licensed as nurseries or nursery dealers
- 648 federal phytosanitary certificates issued
- 49 active compliance agreements with various businesses

## 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. Over 7,800 businesses were licensed as Plant Merchants in Pennsylvania in 2014. This number includes nursery operations, greenhouse operations, plant dealers, brokers, and landscapers.

## Phytosanitary Certification:
In 2014, 648 federal phytosanitary certificates were issued to ship plants internationally. 586 state phytosanitary certificates were issued to ship plants within the United States.

## Nursery/Nursery Dealer Inspections:
A total of 4,695 inspections of nurseries, nursery dealers and greenhouses were performed for calendar year 2014. Inspections are conducted to protect Pennsylvania horticulture from harmful plant pests, and as surveillance of the nursery industry which serves as a pathway for potential new exotic pest introductions that could prove harmful to Pennsylvania’s green industries. 312 “Stop Sales” were issued as a result of identification of pests of concern by the plant inspectors. A total of 1,546 samples were processed by the entomology, pathology, botany, nematology, and virology labs to support the Plant Health Program and Plant Inspectors.

## Phytophthora ramorum Trace-Forward investigations in PA:
PDA inspectors visited 105 sites that received shipments from out-of-state *P. ramorum*-positive nurseries, June-October, 2014. The trace-forward plants included: *Rhododendron* spp., *Rhododendron* spp. (azalea), *Pieris* spp., *Pieris japonica*, *Viburnum* spp., *Kalmia* spp., *Kalmia latifolia*, *Camellia japonica*, *Camellia* spp., *Magnolia* spp. *Syringa* spp., and *Syringa x Persica*. A total of 196 samples were collected and submitted to the Plant Disease Diagnostic Laboratory. All samples were *P. ramorum* negative by both molecular and classical isolation techniques. Although the samples were free of *P. ramorum*, many plants were infected with other *Phytophthora* species.
Botany and Noxious Weed Programs

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.

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-Vine** - Pueraria Lobata (*Active Field Program*)
- **Marijuana** - Cannabis Sativa
- **Mile-a-Minute** - Polygonum Persicaria (Active Field Program)
- **Multiflora Rose** - Rosa Multiflora
- **Musk Thistle** or Nodding Thistle - Carduus Nutans
- **Purple Loosestrife** - Lythrum Salicaria (*Active Field Program*)
- **Shattercane** - Sorghum Bicolor

During 2014 the Bureau was actively involved in projects to limit/slow the spread or eradicate four problem weeds in the Commonwealth.

- **Giant Hogweed** – this very toxic plant was originally identified in over 500 locations in Pennsylvania. As of 2014, there are 95 sites enrolled in the program. These sites have had giant hogweed identified on the property in the last three years. Of the 95 active sites, only 22 were positive, having at least one giant hogweed plant identified in 2014.

- **Goatsrue** – This fast spreading weed has been identified in 130 locations, treatments are limiting spread to new areas.
- **Kudzu vine** – 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, a slow-the-spread effort continues in the Sinnemahoning area. PDA was able to assist 43 landowners with invasive plant management and education. Nineteen individual landowners received assistance in mile-a-minute control that totaled 20.5 acres of mile-a-minute management. Although chemical control is still our main control method, other pest management techniques were implemented, such as biological and mechanical control. During the 2013 season 2,000 weevils, *Rhinoncomimus latipes*, were released to control mile-a-minute populations in the Sinnemahoning area.

The Botany program also assists local municipalities in seeking landowner compliance with the control of noxious weeds growing on their properties. PDA is also a resource for identification of new 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 was then identified in 6 additional locations. Continuing efforts in education and weed management planning are part of a response program for this aggressive weed. In 2014, more locations were identified but palmer amaranth has not gone widespread yet. PDA and Penn State are working together to education farmers and the public to try and control the spread.
Pennsylvania Department of Agriculture
2014 Entomology Program Summary

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

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

WAREHOUSE LIGHT TRAP SURVEY:
In May of 2014, the USDA-APHIS PPQ office out of Carlisle PA, established nine light trap sites at warehouses in four PA counties that receive shipments of products originating outside of the United States. Facilities targeted were known to have received shipments that contained pests from abroad in the past. The traps were serviced every two weeks until the end of August. A total of 90 samples were submitted to the PDA Entomology Laboratory for analysis. This survey targeted a combination of 22 different beetles and moths not known to occur in the United States. None of the USDA target pests were detected, but one Bostrichidae species not native to PA, Scobicia suturalis (HORN), was detected on four separate occasions at a site in Allegheny County. References indicate records of this species from California being collected from dead grape vines. Bostrichidae are considered to be non-actionable pests. One of the sites trapped in 2014 was the interior of a facility where the longhorned beetle Psacothea hilaris (Pascoe) was intercepted in PA three years ago. The site has now been monitored for three seasons with no additional detections of the pest.
GRAPE COMMODITY PEST SURVEY:
PDA first implemented a grape pest survey in 2010 using Farm Bill money from the USDA and this survey has been continued through 2014. The survey was run from April until the end of June, completing the 2013 project, and the 2014 grape commodity pest survey started on July 1st and ran until the end of September. The 2014 project will resume in April of 2015 and conclude June 30, 2015. Target pests in 2013 included Autographa gamma (silver-Y moth), Lobesia botrana (European grape vine moth), Spodoptera littoralis (Egyptian cotton leafworm), and Heteronychus arator (black maize beetle). The moths were surveyed using pheromone baited traps and Heteronychus arator was visual survey only. None of the four target pests were detected. Targets for the 2014 survey include Lobesia botrana, Autographa gamma, Epiphyas postvittana (light brown apple moth), Adoxophyes orana (summer fruit tortrix moth), and the recently detected Platynota stultana (omnivorous leafroller). In 2014, survey crews established 244 sites in eight PA counties at farms supporting wine and juice production. The PDA lab received and processed 1,031 samples which contained 797 specimens. No targets were detected in 2014. Surveys did detect six specimens of Duponchelia fovealis (European pepper moth) in Platynota traps in Lancaster County. This represented the first records of this pest in PA. The newly introduced weevil Larinus turbinatus was also detected in one Platynota trap in Lancaster County. Eighteen specimens of native Platynota were collected from Autographa, Lobesia, and Epiphyas traps. Three specimens of Autographa which were not Autographa gamma were collected in Lobesia, Platynota, and Autographa traps. Due to the late season detection of a new grape pest, Lycorma delicatula, survey sites will be shifted and the pest will be added to the target list in 2015.

TOMATO COMMODITY PEST SURVEY:
Due to numerous new detections of the tomato pest, Tuta absoluta (Family Gelechiidae) in Europe, a small survey for this pest was conducted through the PDA IPM program in 2010. In 2011, PDA received Farm Bill money to implement an official tomato commodity pest survey in PA and this was continued through 2014. Similar to the grape commodity survey, the tomato survey runs from July 1, through the end of September, and resumes from April through the end of June the following year. The 2013 project target pests were Tuta absoluta (tomato leaf miner) and Chrysodeixis chalcites (golden twin spot moth), a moth pest recently detected in Ontario, Canada. In July, for the 2014 project, two additional pests were added, Diabrotica speciosa (cucurbit beetle) and Bactericera cockerelli (tomato/potato psyllid). Seasonal surveyors deployed 185 sites in seven counties at tomato processing facilities, retail food distribution centers, as well as at some tomato production sites. Surveyors submitted 1,028 samples throughout the 2014 season that had contained 7,164 specimens, all of which were
negative for the target pests. Traps did collect 13 specimens of other moths in the Family Gelechiidae that were not Tuta absoluta. Traps collected a new county record of the bark beetle Scolytus schevyrewi (banded elm bark beetle) in Snyder County. Two specimens of Diabrotica were captured and were determined not to be Diabrotica speciosa. A total of 11 specimens of Psyllidae were collected but none were determined to be Bactericera cockerelli. This survey will resume in April of 2015.

CUT FLOWER SURVEY:
For many years PDA has worked closely with members of the US Custom and Border Patrol sharing information which leads to the detection of new invasive plant pests. As part of the effort, PDA reviews port interception reports to help identify interception trends and pathways for plant pest introductions. In the past several years Thysanoptera, also known as thrips, had been routinely intercepted on shipments of cut flowers. As a pilot survey in 2013, PDA plant inspectors were asked to sample cut flower shipments the week of February first, focusing on thrips. Inspectors visited nine cut flower distributors in six counties, where they generated 46 samples. The samples contained 80 insect specimens, including beetles, flies, aphids, and the target, thrips. Two of the thrips identified were not native to PA, including Thrips palmi and Frankliniella panamensis. Though these collections are considered to be interceptions requiring no regulatory action, they do demonstrate that a possible pathway for introduction exists. In 2014, the survey was slightly modified to see if serious pests like thrips palmi can survive past the distributor, and remain viable to the flowers retail destination, where the likelihood of transfer to plants for planting is increased. Inspectors visited 83 sites in 38 counties in 2014. A total of 493 samples were submitted that contained 65 specimens. The most interesting detection was a larval specimen verified as Copitarsia decolora intercepted from Allegheny County on a shipment of Alstroemeria from Columbia. This is an actionable pest, though most risk assessments indicate that the species is unlikely to survive in PA. This survey is scheduled to continue in 2015.

EMERALD ASH BORER (EAB):
2014 marked the seventh year since the Buprestidae beetle Agrilus planipennis was discovered in Butler County and the fourth year since the removal of the in-state quarantine which had restricted the movement of materials from known infested areas to non-infested areas. It was also the fourth year of bio-control efforts by our cooperating agency (DCNR), and the fourth season of the tropical ash rearing project to support the production of bio-control agents. At the beginning of 2014 there were 47 counties with confirmed populations of EAB known in PA, and no official survey work was performed by PDA in 2014.
In 2014, largely due to efforts by the DCNR and PDA field crews, 8 additional counties had EAB populations confirmed. These new detections bring the total number of infested PA counties to 55 as of January 1, 2015.

Over 350 Fraxinus uhdei (tropical ash) were started from seed in July of 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 of 2011. In 2012 the ash trees were cut back and an initial shipment of 400 leaves and a number of cut back 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). In 2014, regular shipments were made each week from February through June, and September through December, totaling 7,975 leaves. In June the trees were cut back and 85 boles were shipped. Currently there are 171 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 2014, 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, Sirex noctilio, 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 Patrol, European pest alerts, and NAPIS is used to help refine the list of target pests for PA. Protocols for the surveillance of many of these pests require visual surveillance, while others call for pheromone or plant volatile baited traps. For pests that are trapped, 12 sites were established at sites deemed high-risk for exotic pest introduction with 96 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 1,400 samples and 29,031 specimens. Fortunately no targets of national concern were detected in 2013. Detections of note included 26 Anisandrus maiche, a hardwood ambrosia beetle new to the country in 2006, 11 Scolytus schevyrewi (banded elm bark beetle), 2 Sirex noctilio for the first time from Clearfield County, and 90 Cnestus mutilatus from Montgomery and Lehigh Counties. Visual survey points were taken at all sites and several additional locations, totaling 68 visual survey sites for pests that are visual survey only. All visual surveys were negative for target pests. This survey will be implemented again 2015 targeting different pests and new high-risk locations.

**OTIS TRAP EFFICACY SURVEY:**
PDA has assisted the USDA-APHIS OTIS lab with the development of traps for several years. In 2014, PDA received funding to run traps sites to test design and lure combination efficacy for trapping EAB and other wood destroying insects, particularly Buprestidae. As part of the agreement PDA was also asked to process the samples from sites in Maryland and Michigan for this study. In PA, 48 traps were established at sites in three counties. Sites were run from May through the end of September, and serviced every two weeks. A total of 1,787 samples containing 15,658 specimens were received and processed by PDA from all three states. In PA, the study collected 5,688 specimens. Of these, 256 were from the family Buprestidae, and 163 of those belonged to the genus Agrilus. A total of 27 were EAB. Evaluation of the traps and their efficacy will be performed by the lead researchers from the OTIS laboratory.

**WALNUT TWIG BEETLE (TCD):**
In August of 2011, Penn State Cooperative Extension in Bucks County obtained a sample of dying black walnut. The cause of the dying walnut was confirmed as Thousand Cankers Disease, a disease complex caused by a twig beetle, Pityophthorus juglandis, (WTB) and the fungus it vectors. Trees at the initial detection site were voluntarily removed and destroyed by the property owner in February of 2012 and PA started a state-wide trap survey for the beetle. PA received Farm Bill support to run a 100 trap survey for the beetles starting in July of 2012 and this survey
continued through 2014. Late in 2013, the state of Maryland announced the detection of the WTB in Cecil County, extremely close to the PA border with Chester County. As a result, several of the programs available traps were placed in southern Chester County. PDA deployed 170 traps in 38 counties in 2014. In addition, the DCNR placed and monitored several traps in Bucks County and the state of MD requested assistance with the processing of samples from MD. In all, PDA received and processed 1,621 samples containing 38,134 specimens. A total of 14,648 Pityophthorus juglandis were collected in 2014. The majority of specimens were from the original site in Bucks County which continues to produce large numbers of beetles. Unfortunately, eight sites in Chester County had positive detections for WTB, which led to the expansion of the existing TCD quarantine to include Chester, Delaware, Montgomery, and Philadelphia. Several traps were redeployed from Chester County to Lancaster County mid-way through 2014 when the 2013 farm bill project concluded and the 2014 farm bill project began. This led to the detection of WTB at two sites in Lancaster County which was then added to the quarantine. New positive locations in Chester and Lancaster did not display signs of dieback or mortality similar to those seen in Bucks County, making detection of the fungus difficult. For the detection of Geosmithia morbida, it was necessary to place bolt traps for a period of 30 days which yielded both beetles and fungus, demonstrating the presence of the causal agents for TCD. PA will resume the 2014 project in April of 2015, shifting traps to counties bordering the quarantined zone.

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

APIARY INSPECTION PROGRAM:
The value of the apiary industry in Pennsylvania in 2014 was estimated at over $76 million. Much of this value is attributed to increased yield in crops partially or completely dependent on honey bees for pollination. In 2007, it was estimated that each honey bee colony provided $1,659.21 to Pennsylvania’s economy. Since the onset of Colony Collapse Disorder (CCD) in 2006, more people worldwide have become interested in becoming beekeepers and helping native pollinators. In Pennsylvania, over 3,000 new beekeepers have registered since 2007, including over 500 new beekeepers registering in 2014. Currently, in PA there are approximately 3,300 registered beekeepers. The majority of these beekeepers care for 1-10 hives. As seen on the map, managed honey bee colonies can be found almost everywhere in the Commonwealth from roof tops in urban areas to towns, suburbs, farms, and undeveloped land. From the end of April until the end of October, there were six full time seasonal Apiary Inspectors working across Pennsylvania as well as the State Apiarist located in Harrisburg. Over 6,600 colonies located in more than 1,250 apiaries (bee yards) were inspected. Approximately 19% of (about 740) beekeepers registered in PA had their honey bee colonies inspected.
In several areas in eastern PA, beekeepers and inspectors reported seeing blue-green nectar and honey in honey bee hives. While plants will naturally produce different colors of nectar, the colors seen in these hives was unusual. A sample was sent to a lab for testing to be sure that the bees had not collected anti-freeze (ethylene glycol or other alcohols) or liquid containing nonfood blue dye (Copper). These chemicals were not detected and samples will be sent for pollen analysis.

**HONEY BEE DISEASES AND PESTS:**

Six cases of American Foulbrood (AFB), a highly contagious disease affecting honey bees, were detected in PA in 2014. The PA Department of Agriculture continues to focus on detection and treatment of AFB. All suspect cases of AFB were submitted to Harrisburg and then sent on to the USDA, Beltsville, Maryland for laboratory testing to confirm the diagnosis and to screen for Oxytetracycline HCL resistance. Three of the AFB strains were susceptible, and therefore treatable with the antibiotic Oxytetracycline HCL, two were resistant to Oxytetracycline HCL, and one strain was inconclusive. Resistant strains of AFB may be treated with different antibiotics or irradiated. Many beekeepers chose to burn the infected hive(s) since the antibiotics do not kill the bacterium causing AFB. The Varroa mite, *Varroa destructor*, continues to be found throughout Pennsylvania and many parts of the world. These insect pests of the honey bee are a serious concern to beekeepers because they vector viruses causing diseases and can weaken a colony enough to cause the bees to abscond or die. Small hive beetles continue to spread throughout Pennsylvania.

**PERMITS ISSUED:**

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

**NATIONAL HONEY BEE SURVEY:**

This was the fifth year that Pennsylvania was able to participate in the USDA/APHIS National Honey Bee Disease Survey (NHBS). The objective of this survey is to determine the diseases, pests, and parasites present, or absent, in various operations throughout the United States, including a cross-section of operation types. The diseases, pests, and parasites include: American Foulbrood, European Foulbrood, Sacbrood, Chalkbrood, Parasitic Mite Syndrome, Deformed Wing Virus, Black Shiny Bees, Small Hive Beetles, Wax Moths, *Varroa* mites, *Nosema* spores, and *Tropilaelaps* mites. The survey also records the status of the queen. Live bee samples are sent for virus testing. As of December 2014, 18 of the 24 apiaries have been sampled. The remaining six will be completed in the spring of 2015.
KHAPRA BEETLE SURVEY:
Khapra beetle (Trogoderma granarium) is one of the most destructive invasive pests of grain and is often intercepted in imported grain products. In the past several years multiple interceptions of the pest in products like rice have been made all over the United States including an airport interception in Pittsburgh in 2013. PDA was awarded Farm Bill money to survey for this pest starting in July of 2013. PDA established 18 sites in 18 counties at grain facilities where Agronomic Product Inspectors deployed three traps each. Traps were serviced every two weeks and generated 261 samples in 2013. All trap samples were negative for Trogoderma granarium in 2013. The survey resumed in April of 2014 and inspectors established 15 different sites in 15 Counties. This survey concluded in June of 2014 when farm bill funding was discontinued. However, a few inspectors elected to continue running traps until supplies were used up in the fall of 2014. A total of 352 samples were generated by this survey that contained 73 specimens of the family Dermestidae. None were identified as Trogoderma granarium. PDA has no plans to run this survey in 2015.

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

PLANT DIAGNOSTIC SAMPLE REPORTS (PDSR):
In support of the PDA Plant Merchant Program, the Entomology Lab processes plant inspector collected samples from routine plant merchant inspections where a pest of regulatory concern is suspected. A total of 227 samples were submitted in 2014. The most commonly submitted pest was Platynota stultana, (Omnivorous leafroller) which was found causing significant damage to Cyclamen in a commercial greenhouse from the first time in 2013. Voluntary trapping was conducted by the facility in 2014 which yielded 30 positive samples. No other samples of this new pest were submitted from other locations. The same facility also developed a problem with Duponchelia fovealis (European pepper moth) and also started trapping for this
pest after it was discovered in traps from a Farm Bill survey placed on the exterior of their property. Duponchelia fovealis was also not submitted from any other location.

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

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

SPOTTED LANTERNFLY (SL):
On September 22, an educator with the PA Game Commission submitted a report detailing damage to Ailanthus altissima (tree of heaven) and the presence of an unknown insect associated with the damage in Eastern Berks County. An inspection by PDA staff resulted in the collection of a pest new to North America, Lycorma delicatula (spotted lanternfly). SL is a plant hopper native to China, India, and Vietnam and was introduced into Japan and South Korea. In South Korea, it spread rapidly after its introduction in 2006 and is considered to be an invasive pest. A literature review lists at least 70 known host plants, with the most significant agricultural damage occurring on species of grape. SL completes one generation a year. The insect overwinters as an egg mass of 30-50 eggs covered with a mud-like protective foam. The first egg masses
started to be deposited on or about October 13, and can be laid on most smooth surfaces, but seem to be concentrated near tree of heaven. Egg masses have been recorded on many tree species in PA as well as on rocks, stone slabs, pallets, and have been found hidden under the loose bark of dead trees. Literature suggests that eggs will hatch sometime in May, and that nymphs will broaden their host range and begin feeding immediately. There are four instars and the literature states that nymphs crawl up their feeding host each day. The immature stages start off black with white spots, and gradually develop red patches as they get older. Toward the end of summer adults will emerge, and it is at this time that the pest narrows its host range and starts to feed and congregate preferentially on tree of heaven. Adults will mate, lay eggs and then die off with cold weather. Reports from South Korea suggest that females might lay eggs more than once before dying. A number of steps were implemented soon after the detection of the pest. A new pest advisory group (NPAG) was formed with our USDA counterparts and a risk assessment was completed. The NPAG report concurred with existing literature and recommended that the pest be considered reportable/actionable, and ports of entry were instructed to screen for Lycorma. This group meets weekly by conference call to discuss updates and share information as it becomes available. In addition, a national technical working group (TWG) was formed to answer key questions about the new pest. The TWG is comprised of expert plant hopper workers and started to work on a number of questions posed by the NPAG. PDA implemented an immediate delimiting survey focusing on the core infested area, but also looking out at distances of 5 miles, and 3 miles from the initial detection when the adults were still alive. As of the mid-December, detections had been made in 40 one kilometer by one kilometer grids. Based on the limited available methodology, data from the survey indicates the heaviest populations are within one or two centrally located grids, with outer
positive grids being represented by only a few specimens. Land managers from state and federal agencies have met to discuss possible eradication or control methods. Most methods are still being evaluated, but scraping of egg masses and tree banding are methods that will likely be employed. A quarantine restricting the movement of the pest and its conveyances was implemented. Town hall meetings to discuss the quarantine and its implications were held. Outreach material was produced, and a web site was developed to assist with information sharing (www.pda.state.pa.us/spottedlanternfly). The local community has formed a citizens action group and has been assisting with education of the community and is looking into assisting with control measures. PDA is hoping to obtain funding to work with the community on a banding and egg mass scraping. Right now, citizens can report egg masses they have scraped, and view instructions for reporting from the SL website. PDA is hoping to implement a volunteer tree banding program in May of 2015. Citizens would be enlisted to deploy tree bands on their property and provide counts of insects trapped to an on-line database. Sticky tree bands have been used effectively in South Korea to control this pest and are relatively inexpensive and easy to deploy. The hope is that combined methods like egg mass scraping, tree banding, quarantine, and additional measures as they become available will act in concert to eliminate this pest before it spreads. In addition to support from the local community, local government, state, and federal agencies have assisted with resources. The DCNR and USFS have offered expertise and are attempting to provide accurate tree of heaven coverage maps. Studies to determine temperature tolerance and mitigation of egg masses are being conducted. Berks County has provided communications and logistical support. The PDA-PSU plant health resource center has provided funding for the production of outreach materials.

Members of the local business community have also assisted by volunteering time and equipment for biological studies, and by working with PDA to alter practices to avoid the transportation of egg masses to new areas. Companies that have shipped out of the core infested area have provided shipping records, and these locations have been inspected and found to be free of SL.

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

INVASIVE SPECIES HOTLINE AND E-MAIL REPORT SYSTEM:
In 2014, the invasive species hotline and badbug e-mail account generated 304 contacts to report possible invasive insects. Of the 304 contacts, 226 were to the toll-free automated invasive species line and 78 were to the badbug e-mail. The majority of public contacts were to report or ask about EAB. Several residents of Berks County called to report or ask questions about Lycorma delicatula late in the year.
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 3,204 Prunus samples were processed through the FTIP laboratory in 2014, including 306 samples from two registered budwood production blocks, and 184 samples from a registered seed block. Composite samples from certified nursery rootstock blocks numbered 120. A total of 2,406 potential unregistered budwood source tree samples were submitted for testing by the nurseries, and an additional 132 common budwood samples were collected by FTIP personnel. In addition to the total of Prunus samples mentioned above, 1,566 samples were also collected from the registered seed and budwood blocks, as well as three common source blocks, for the sole purpose of plum pox virus testing. To monitor for tomato ringspot virus and its nematode vector, 144 broadleaf weed and 15 soil samples were collected and tested.

Registered blocks and nursery production blocks were found in thrifty growing condition, with no obvious signs of virus infection. All blocks met all virus-testing requirements for FTIP certification. No ToRSV was detected in rootstock blocks or in registered source blocks. PNRSV and PDV are the two viruses that remain the most commonly found viruses in Prunus in Pennsylvania, although finds in registered blocks and nursery production blocks are rare. Xiphinema sp. (dagger nematode) were present at very low but detectable levels in registered blocks, in nursery production blocks, and in proposed sites for nursery production. Their presence makes broadleaf weed (virus reservoir) control extremely important, to prevent introduction of tomato ringspot virus into the production scheme. All samples tested negative for plum pox virus, a virus declared eradicated from Pennsylvania in 2009.
DISEASE DIAGNOSTIC LABORATORY RESULTS

2014 By The Numbers: Disease Diagnostic Laboratory Samples

- 2,195 samples processed
- 663 samples tested positive for a disease organism

Pathogens detected in samples submitted to PDA: The Plant Disease Diagnostic Laboratory received a total of 2,195 samples in 2014, as recorded in the PaPlants database. This marked an increase in sample numbers from 2013. 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 2,195 samples received, 663 (30.2 %) were associated with biotic causal agents: Fungus (481), Virus (97), Bacteria (74), and Nematode (11). In 2014, the occurrence of bacterial disease peaked during the months of April-June; Fungus April-August; Nematode August-December; and Virus February-April (Table 1).

Table 1. Monthly distribution of pathogen groups, 2014

<table>
<thead>
<tr>
<th>Month</th>
<th>Bacteria</th>
<th>Fungus</th>
<th>Nematode</th>
<th>Virus</th>
<th>Total, N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>3</td>
<td>7</td>
<td>1</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Feb</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td>23</td>
<td>40</td>
</tr>
<tr>
<td>Mar</td>
<td>1</td>
<td>20</td>
<td></td>
<td>26</td>
<td>47</td>
</tr>
<tr>
<td>Apr</td>
<td>12</td>
<td>66</td>
<td></td>
<td>24</td>
<td>102</td>
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<tr>
<td>May</td>
<td>26</td>
<td>68</td>
<td>1</td>
<td>8</td>
<td>103</td>
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<td>Jun</td>
<td>18</td>
<td>71</td>
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<td>6</td>
<td>95</td>
</tr>
<tr>
<td>Jul</td>
<td>4</td>
<td>51</td>
<td></td>
<td>7</td>
<td>62</td>
</tr>
<tr>
<td>Aug</td>
<td>2</td>
<td>76</td>
<td>2</td>
<td>1</td>
<td>81</td>
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<td>Sep</td>
<td>2</td>
<td>30</td>
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<td>34</td>
</tr>
<tr>
<td>Oct</td>
<td>2</td>
<td>49</td>
<td>2</td>
<td></td>
<td>53</td>
</tr>
<tr>
<td>Nov</td>
<td>2</td>
<td>22</td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Dec</td>
<td></td>
<td>7</td>
<td>4</td>
<td></td>
<td>11</td>
</tr>
<tr>
<td>Total, N</td>
<td>74</td>
<td>481</td>
<td>11</td>
<td>97</td>
<td>663</td>
</tr>
</tbody>
</table>

Commonly collected biotic diseases: Of the 663 samples for which a disease-causing organism was confirmed, the lab identified 155 different pathogens across 188 different hosts. There were nine pathogens that were each confirmed from ten or more samples submitted in 2014 (Table 2).
Boxwood blight, *Cylindrocladium pseudonaviculatum*: The first detection of boxwood blight in Pennsylvania was at a single nursery location in Lancaster County in January 2012. Efforts to educate regulatory staff, extension staff, landscape professionals and growers on this new disease threat yielded good results, with only a small number of positive finds in 2013. Trace forward investigations from known positive sites from other states also yielded positive finds. A total of 12 positive samples were identified in 2013. In 2014, plant inspectors submitted 62 boxwood samples. Of those, nine samples (originating from six locations in Bucks, Lehigh, and Delaware counties) tested positive for boxwood blight. Positive samples were submitted in August, October, and December. All positive material was destroyed according to PDA eradication protocols.

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 2014, greatest success in *G. morbida* detection was from bolt traps, since new positive trap sites did not necessarily have obvious disease in nearby walnut. *G. morbida* was isolated and confirmed from Chester County in 2014, but not from PA’s third *P. juglandis* positive county, Lancaster.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Tobacco Mosaic Virus</th>
<th><em>Sigmodiella laevis</em></th>
<th><em>Volutella buxi</em></th>
<th><em>Plasmopara obducens</em></th>
<th><em>Impatiens Necrotic Spot Virus</em></th>
<th><em>Xanthomonas vesicatoria</em></th>
<th><em>Phaeocryptopus gaeumannii</em></th>
<th><em>Puccinia horiana</em></th>
<th><em>Phytophthora citricola</em></th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Petunias</td>
<td><em>Petunia</em> spp.</td>
<td>38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>Spruce, Blue</td>
<td><em>Picea pungens</em></td>
<td>29</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>29</td>
</tr>
<tr>
<td>Garden Impatiens</td>
<td><em>Impatiens walleriana</em></td>
<td></td>
<td>22</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>Boxwood</td>
<td><em>Buxus</em> spp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>Pepper</td>
<td><em>Capsicum annuum</em></td>
<td></td>
<td>1</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Douglas-fir</td>
<td><em>Pseudotsuga menziesii</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Chrysanthemum</td>
<td><em>Chrysanthemum</em> spp.</td>
<td></td>
<td>1</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Nettle, Flame</td>
<td><em>Coleus</em> spp.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Rhododendron</td>
<td><em>Rhododendron</em> spp.</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>11</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td></td>
<td></td>
<td>38</td>
<td>29</td>
<td>22</td>
<td>18</td>
<td>15</td>
<td>15</td>
<td>12</td>
<td>11</td>
<td>184</td>
</tr>
</tbody>
</table>

Table 2. The most commonly collected biotic diseases, 2014
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. The disease epidemics have occurred in the U.S. through the plant distribution conduit. In recent years, the disease occurrence rates, sites, over-wintered and over-summered inoculi, and the pathogen dissemination conduits have declined. In 2014, plant inspectors submitted 12 rust-infected plants from six counties over the autumn months: one in August, eight in September, and three in October. This late season occurrence indicates the inoculum source was likely an introduced, not a locally over-wintered, source. PA has combatted the disease for the past eleven years. Patterns of disease occurrence suggest that control can be achieved through grower and public education and participation: (1) The pathogen is an obligate parasite and cannot survive without a living chrysanthemum host; (2) The rust fungus survives in protected areas and indoors during winter months in PA, but not in open fields; (3) Chrysanthemum white rust-infected plants may over-summer in PA, but unlikely under dry and hot weather conditions; and (4) excellent fungicides are available to control the disease.

**Poppy Downy Mildew:** *Peronospora arborescens*, downy mildew of *Papaver* (Oriental poppy) was detected for the first time in Lancaster and York County during Feb – May in 2013. The 2014 recurrence of the disease indicates that it may become a chronic problem. Plant Inspectors encountered poppy downy mildew in Westmoreland and Butler Counties in April and June, 2014. PDA informed USDA-PPQ about the presence of the pathogen in PA but it is not a federally regulated pathogen.

**Tobacco Mosaic Virus (TMV) on Petunia.** In 2014, an old adversary – TMV – reared its ugly head in greenhouses, after introduction of the disease early in the production scheme. PDA Plant Inspectors sampled symptomatic and suspect plants, primarily petunia. During Feb-April, the PDA diagnostic lab detected 38 TMV-positive petunias from greenhouses in eight PA Counties: Bucks, Columbia, Cumberland, Huntingdon, Lancaster, Lebanon, Luzerne, and Northumberland. One scaevola and one salvia sample also tested positive for TMV.

**PLANT 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 2014. 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 2014 report. To summarize here, the EWBB survey included 12 trapping sites (one in each of twelve counties) plus visual survey records. The 12 trapping locations (96 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 29,031 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.

2) **Survey for Cyst Nematodes of Regulatory Importance**

<table>
<thead>
<tr>
<th>2014 By the Numbers: CAPS nematode survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sampled potato and tomato fields:</td>
</tr>
<tr>
<td>24 counties, mostly on the western side of PA</td>
</tr>
<tr>
<td>104 fields,</td>
</tr>
<tr>
<td>542 samples</td>
</tr>
<tr>
<td>All samples have tested negative for target pests, although processing is ongoing at the writing of this report.</td>
</tr>
</tbody>
</table>

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 prompted APHIS PPQ to direct and fund a cooperative survey program for its detection. 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. This year, we added *Meloidogyne artiellia* and *Punctodera chalcoensis* to our target pest list.

With the assistance of PSU county agents, 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.
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 wet-sieved via modified Fenwick can or elutriated. 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 2014 addressed this pathway by monitoring for five diseases in commercial nurseries and greenhouses. The disease targets for this survey were *Phytophthora alni*, *Phytophthora ramorum*, *Phytophthora quercina*, *Candidatus Phytoplasma pini* 16SrXXI-A and *Calonectria/ Cylindrocladium pseudonaviculata*. 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.

<table>
<thead>
<tr>
<th>Pathogen/Phytoplasma</th>
<th># target hosts surveyed</th>
<th># counties</th>
<th># sites*</th>
<th># plants inspected</th>
<th>Positives</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Calonectria pseudonaviculata</em></td>
<td>3/3</td>
<td>29</td>
<td>116</td>
<td>1,149,711</td>
<td>0</td>
</tr>
<tr>
<td><em>Candidatus Phytoplasma pini</em> 16SrXXI-A</td>
<td>1/1</td>
<td>14</td>
<td>38</td>
<td>9,863</td>
<td>0</td>
</tr>
<tr>
<td><em>Phytophthora alni</em></td>
<td>1/1</td>
<td>4</td>
<td>5</td>
<td>924</td>
<td>0</td>
</tr>
<tr>
<td><em>Phytophthora quercina</em></td>
<td>1/1</td>
<td>13</td>
<td>31</td>
<td>36,047</td>
<td>0</td>
</tr>
<tr>
<td><em>Phytophthora ramorum</em></td>
<td>5/5</td>
<td>26</td>
<td>176</td>
<td>30,893</td>
<td>0</td>
</tr>
</tbody>
</table>

* Site = host/establishment combinations
As noted earlier in this report, boxwood blight (*Cylindrocladium/ Calonectria pseudonaviculata*) was detected at several sites in Pennsylvania in 2014. However, this CAPS survey did NOT pick up that pathogen, nor any of the other target pests.

**Other Pennsylvania surveys:**

**Soybean cyst nematode (SCN):** SCN, *Heterdera glycines*, is of concern to Pennsylvania due to its impact on phytosanitary certification of nursery stock and its economic damage potential for soybean production (540,000 acres planted in PA in 2013). SCN has been found in only one PA county, and is limited in distribution within that county. In 2014, soybean fields were surveyed for SCN via soil sampling. No SCN was detected.

**Fruit Tree Exotic Disease Survey:** A Farm Bill Survey of exotic pathogens in orchards was conducted for the first time in 2014. None of the target pathogens are known to occur in PA; all are identified as national targets for survey: Plum Pox Virus, Apple brown rot (*Monilinia fructigena*), 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.

<table>
<thead>
<tr>
<th>2014 By the Numbers: Plum Pox Virus Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 counties, centering around Adams County</td>
</tr>
<tr>
<td>31 blocks</td>
</tr>
<tr>
<td>6,451 samples</td>
</tr>
<tr>
<td>All samples tested negative for PPV</td>
</tr>
</tbody>
</table>

**Phytoplasma and Brown Rot Survey:** In 2014, 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, 131 samples were collected from apple, pear, peach, apricot, and plum trees in Adams, Berks, Lancaster, and York Counties. All samples tested negative for exotic Apple Proliferation phytoplasma (*Candidatus Phytoplasma mali*) and European stone fruit yellows phytoplasma (*Candidatus Phytoplasma prunorum*). However, other phytoplasma species were detected from apple, pear and peach trees. Based on molecular diagnostics, phytoplasmas from peach and apple were identified as Ca. Phytoplasma *pruni* (16SrIII-A group, X-disease group), while phytoplasma from pear was identified as Phytoplasma *pyri* (Group 16SrX-C). While Adams County, PA has a history of X-Disease on peaches (1979 - 1980), apple was not known to host X-disease group phytoplasmas. Apple phytoplasma identification was confirmed by USDA and a new disease name, “Apple X-Disease,” was established to distinguish from common X-Disease known on *Prunus*.
**Cherry Virus A Survey:** Plant Health was asked by the Clean Plant Center Northwest 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 four 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 was asked to collect samples from 18 peach/nectarine blocks and two tart cherry blocks beginning in 2014 and wrapping up in 2015. Plant Health submitted samples from six peach blocks in 2014.

**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 five years, 2010-2014. Dr. Thomas Hall, Forest Plant Pathologist, collected 526 samples from 43 PA forest stream sites and submitted to the PDA Disease Diagnostic Laboratory. The lab isolated 475 alleged *Phytophthora* cultures from the 526 samples. The cultures are deposited in the PDA culture collection for future reference and research. This five year forest stream survey failed to detect *Phytophthora ramorum* in PA streams, but 90.3 % of stream samples carried other species of *Phytophthora*.

**SPECIAL PROJECTS**

**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 five years, 2010-2014. In 2014, the PDA lab processed 665 samples from 85 different sites in nine States (AL, FL, GA, MS, NC, NY, PA, SC, and TX), and the conclusions were: (1) The Rhododendron leaf bait samples from the streams of AL (AL1, AL4, AL6, and AL9), FL (FL10C), MS (MS2), and NC (NC11) were *P. ramorum* positive; (2) AL1 (4/3/2014), AL9 (3/27/2014), and FL10C (3/4/2014) were the first occurrence record of *P. ramorum* in 2014; (3) “Whole leaf” and “Leaf pieces’ bait protocols were adopted to detect *P. ramorum* for the forest stream survey in 2013-2014; (4) In 2014, the “whole leaf” protocol detected five *P. ramorum* positive streams, and the “leaf pieces” detected four streams; (5) All nine GA environmental plant samples exhibiting SOD symptoms were *P. ramorum* negative; (6) As indicated in previous years (2010-2013), the early season baits in spring (March – May) detected *P. ramorum* positive streams more than late season (October – November); and (7) In 2014, of the total nine *P. ramorum* positives, seven were early season baits, and the remaining two were late season baits. PDA diagnostic lab has isolated *Phytophthora* species from the forest streams of the 15 Eastern Regional States and has archived them in the PDA culture collection.

**Phytophthora root rot of Fraser fir:** *Phytophthora* root rot is a serious threat to Christmas tree production in PA. PDA Plant Inspectors have collected *Abies* spp. showing root rot symptoms, mostly from nurseries, while providing inspection and certification services over the last 28 years (1986-2013). Among 300 *Abies* samples displaying *Phytophthora* root rot symptoms, collected from 47 Counties, 229 turned out to be *Phytophthora* positive. Fraser fir, *Abies fraseri*, seems to be the most vulnerable host with 74.7 % of the positives (37 Counties) corresponding to this host. White fir (*A. concolor*) was the next most common host (8.7 % from 12 Counties).
remaining samples corresponded to Balsam (A. balsamea), Canaan (A. intermedii), Noble (A. proera), Grand (A. grandis), and Korean (A. koreana) firs. Phytophthora isolates cultured from the 229 samples using PARP medium belonged to eight species, based on both morphological characteristics and ITS sequences, and were stored in the PDA culture collection. P. cryptogea, P. cactorum, P. drechsleri and P. citricola were associated with 83% of the samples, and the rest were associated with P. cinnamomi, P. medicaginis x cryptogea, P. citrophthora, and P. cambivora. A significant portion of Fraser fir samples displaying Phytophthora root rot symptoms (40.5%) came from three counties, in which P. cryptogea, P. drechsleri, P. cactorum, and P. citricola were associated with 93.3% of the samples. PDA has published an abstract on this project: Phytopathology 104 (S3):61.

Rapid Decline of Apples in 2014: 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 one season
- severe shedding of bark around the tree’s graft union
- large dark brown cankers above and below graft union
- cankers usually solid, not soft and spongy
- rootstock often sending up green suckers

TriFoCap, ELISA and PCR testing for a small, specific set of plant viruses yielded no conclusive viral cause for the decline. Penn State will continue investigations into other potential causes in 2015, if the syndrome continues to develop.
National Harmonization of Virus-tested Specialty Crop Certification Regulations: The Pennsylvania Department of Agriculture has been deeply involved in a national effort to harmonize virus-tested fruit tree nursery certification program regulations, culminating in a standard published online at http://ncpn-ft.org/wp-content/uploads/2011/04/Model-Standard-October-2012.pdf. Pilot programs based on the new standard were successfully executed by three states, including Pennsylvania.

The PDA has also contributed to a project to harmonize the organization and language of virus-tested certification regulations across National Clean Plant Network commodities. In 2014, Ruth Welliver and Sarah Gettys contributed to “Safeguarding Fruit Crops in the Age of Agricultural Globalization,” a feature article published in the February 2015 issue of Plant Disease (Vol. 99 No. 2: 176-87). Dr. Rose Gergerich, principle author, and the team of ten additional contributors summarized the cooperative efforts of the National Clean Plant Network (NCPN) and its work to provide clean plant material for U.S. nurseries and fruit growers. The NCPN supports production systems that minimize the risk of unintended introduction of plant pests while encouraging the safe trade of healthy plants.

Systems Approach to Nursery Certification (SANC): Pennsylvania was chosen as one of eight states to pilot the National Plant Board’s Systems Approach to Nursery Certification program (http://sanc.nationalplantboard.org). Chosen from 20 applicants from across the United States, Pennsylvania will be joined by Missouri as the first two states to have a nursery participate in the SANC pilot; Conard-Pyle is Pennsylvania’s pilot facility. Pennsylvania has helped to shape the SANC initiative since its inception, and Dana Rhodes was made a member of the SANC core group in 2014. SANC focuses on identifying Critical Control Points, Best Management Practices, and audit approaches to nursery systems management, with the ultimate goal of growing a better product.  

http://sanc.nationalplantboard.org/

Plant Health Resource Center: Conceived in 2012, The PDA-PSU Plant Health Resource Center continues to evolve, to find areas of need that can be uniquely filled through interaction of PA Department of Agriculture and Penn State University personnel. In 2014, PSU took the lead in a project to create informational kiosks at Produce Auctions around the state, a way to reach out to a grower community that is not as likely to be reached with electronic communication. Both PDA and PSU provided outreach materials to stock the kiosks. The Plant Health Resource Center also coordinated several training events of benefit to PDA and PSU staff, and funded development of fact sheets on several new pests of regulatory significance (boxwood blight, omnivorous leafroller). The Plant Health Resource Center Advisory Committee, consisting of industry stakeholders, was formed and met for the first time in 2014.  

http://agsci.psu.edu/resource-centers/plant-health
West Virginia Department of Agriculture

Plant Industries Division

Report to the Eastern Plant Board

Portsmouth, New Hampshire - April 7-9, 2015

2014 Activities

Plant Industries Division combats a wide array of native and non-native plant pests and diseases through extensive surveillance, regulatory and control programs, many as part of federal cooperative agreements. The division is broken down into two main program units: Agricultural Pest Survey and Forest Health Protection.

Agricultural Pest Survey (APS) Programs

Cooperative Agricultural Pest Survey (CAPS) Program

The CAPS program conducts surveys for insects, plant pathogens and injurious weeds in field crops to detect any new non-native plant pests and to monitor the impact of native agricultural pests. The program functions in a cooperative agreement with USDA-APHIS-PPQ on specific pest-control issues, supports export certification programs, and contributes data to the National Agricultural Pest Information System (NAPIS) and Integrated Plant Health Information System (IPHIS) computer databases.

- Released 4,000 Mile-a-Minute, Rhinoncomimus latipes, weevils at seven sites in Hampshire, Morgan, Mineral and Hardy counties for biological control of mile-a-minute weed.
- Released 102 yellow toadflax, Mecinus janthinus, weevils at a location in Pendleton County for biological control of yellow toadflax.
- Traps were set for Adoxophyes orana (summer fruit tortrix moth), Autographa gamma (silver Y moth), Chrysodeixis chalcites (golden twin spot moth), Helicoverpa armigera (old world bollworm) and Spodoptera littoralis (Egyptian cottonworm) and visual surveys conducted for Alectra vogelli (yellow witchweed) at 13 sites in 6 counties as part of a Soybean Commodity Survey. No positives were discovered.
- Traps were set for Adoxophyes orana (summer fruit tortrix), Drosophila suzukii (spotted wing Drosophila), Epiphyas postvittana (light brown apple moth), Leucoptera malifoliella (pear leaf blister moth) and Lobesia botrana (European grapevine moth) at 20 sites in 12 counties as part of a Bundled Berry Survey. No positives were discovered.
- Traps were set for Dendrolimus pini (pine tree lappet), Dendrolimus sibircus (Siberian silk moth), Hylobius abietis (large pine weevil), Lymnatria mathura (rosy moth), Panolis flammea (pine beauty moth), and Tomicus destructor (pine shoot beetle) and visual surveys were conducted for Cronartium flaccidum (Scots pine blister rust) at 50 sites in 31 counties as part of a Pine Commodity Survey. No positives were discovered.
- Traps were set at 40 sites in 20 counties for Archips xylostanaus (variegated golden tortrix), Adoxophyes orana (summer fruit tortrix), Drosophila suzukii (spotted wing drosophila), Synanthedon myopaeformis (apple clearwing moth), Spodoptera littura (cotton leafworm), and Enarmonia formosana (cherry bark tortrix) and visual surveys were conducted for Candidatus Phytoplasma as part of an Apple Commodity Survey. No positives were discovered.
- Surveyed 33 nurseries for Sudden Oak Death, Phytophthora ramorum, collecting 307 foliar samples and six water samples for PCR analysis. All samples were negative.
- Placed 22 purple sticky traps in campgrounds across the state to survey for emerald ash borer. New county detections for 2014 include Ohio, Hardy, Pleasants, Wood, Jackson, Mason, Logan, Wyoming and McDowell counties.
- Traps were set for Asian longhormed beetle (ALB) at 4 sites in 4 counties. No ALB was detected.
- Provided health certificates for interstate movement of West Virginia seed potatoes.
- Traps were set at 10 sites in six counties for *Adoxophyes orana* (summer fruit tortrix), *Epiphyas postvittana* (light brown apple moth), *Enarmonia formosana* (cherry bark tortrix), *Lobesia botrana* (European grapevine moth) and *Thaumatotibia leucotreta* (false codling moth) as part of a Stone Fruit Commodity Survey. No positives were discovered.
- Surveyed for plum pox virus (PPV) in Berkeley, Hampshire and Monroe counties following National Plum Pox Survey Guidelines as part of the Stone Fruit Commodity Survey. A total of 720 samples were collected. All samples were negative.
- Traps were set at 21 sites in 15 counties for *Adoxophyes orana* (summer fruit tortrix), *Autographa gamma* (silver Y moth), *Epiphyas postvittana* (light brown apple moth), *Eupoecilia ambiguella* (European grape berry moth), *Lobesia botrana* (European grapevine moth) and *Thaumatotibia leucotreta* (false codling moth) as part of a Grape Commodity Survey. No positives were discovered.
- Staff presented invasive forest pest information on 41 occasions in 23 counties as part of a Forest Pest Outreach Project.
- Staff distributed forest pest information and “Don’t Move Firewood” reusable shopping bags with WVDA contact information to 63 campgrounds in 26 counties as part of a Camper Education, Outreach and Data Capture Survey. Camper zip code data was also collected in order to assess future exotic pest survey sites.
- Collected and released approximately 200 *Galerucella* beetles from the Purple Loosestrife biocontrol rearing site in Buckhannon to a site in Clendenin for the biocontrol of this invasive weed.

**Plant Pest Regulatory Program (PPRP)**

The PPRP works to prevent the movement of plant pathogens on nursery stock produced in West Virginia and nursery products imported into the state. The program includes registration and annual inspection of nurseries and nursery dealers, and the enforcement of state plant quarantines and orders. The Gypsy Moth Slow the Spread Regulatory Program is also operated by the PPRP through a cooperative agreement with USDA-APHIS-PPQ. In addition, the PPRP certifies domestic and international shipments of plants and timber products.

- Registered 101 nurseries and 373 nursery dealerships. Conducted 142 nursery inspections and 38 nursery dealership inspections resulting in the stop sale or destruction of 1,172 pieces of nursery stock because of injurious plant pests, diseases or violations of state quarantines.
- Conducted inspections and issued 2,932 USDA-APHIS-PPQ phytosanitary certificates for international log, lumber or plant shipments.
- Issued one phytosanitary certificate for an interstate plant shipment. One vendor, under compliance agreement, produced 28 shipments including 103 boxes of herbaceous plant material destined for US states or territories.
- Visited 66 sites to investigate the movement of articles capable of transporting the gypsy moth into uninfested areas.
- Conducted 33 inspections at West Virginia plant vendors surveying for *Phytophthora ramorum* and collected 313 samples for testing.

**Black Fly Control Program**

The Black Fly Control Program has the responsibility of significantly reducing the black fly population in southeastern West Virginia without adversely affecting non-target aquatic organisms within the area of treatment. This is accomplished by monitoring black fly larval development in certain southern West Virginia river systems for the purpose of determining the optimum time to conduct black fly control operations. Suppression activities target problem areas of the New, Bluestone and Greenbrier Rivers.

- Supervised 17 aerial black fly treatments.
- Conducted 135 aquatic invertebrate monitoring trips.

**Pest Identification Laboratory (PIL)**

The PIL is a cooperative effort of the entomology and plant pathology staff. It complements the pest survey and detection efforts of the APS Unit by providing expertise in the identification of insects, plant diseases, weeds and other pests. The PIL also disseminates information on the pests identified and investigates problems considered significant from a biological, regulatory or impact standpoint. PIL personnel maintain permanent reference collections
and record systems of insects, plant diseases and weeds. Pest control recommendations are provided for private individuals, businesses and other government agencies when needed.

- Confirmed the presence of Emerald Ash Borer (EAB), *Agrilus planipennis*, in 9 new Counties in West Virginia: Hardy, Jackson, Logan, Mason, McDowell, Ohio, Pleasants, and Wood Counties.
- Screened 26 trap samples for the presence of three exotic moth species for the Bundled Nursery Cooperative Survey. Survey results were negative.
- Screened 517 trap samples for the presence of six exotic insect species for the Apple Commodity Survey. All samples were negative.
- Confirmed the presence of the Spotted Wing Drosophila (SWD), *Drosophila suzukii*, in one new County: Fayette.
- Screened 297 trap samples for the presence of six exotic moth species for the Grape Commodity Survey. All samples were negative.
- Screened 93 trap samples for the presence of five exotic moth species for the Stone Fruit Commodity Survey. All samples were negative.
- Screened 133 trap samples from the Pine Commodity Survey for the presence of an exotic root weevil, *Hylobius abietis* and the Pine Shoot Beetle, *Tomicus destructor*. All samples were negative.
- Entered approximately 474 identified specimens into the Insect Museum’s computerized database, making a total of 131,050 identified specimen records and added approximately 115 undetermined prepared specimens.
- Provided Insect Museum specimen loans and/or data base information and specialized insect identification requests for the Ohio State University, West Virginia University, Carnegie Museum, US Forest Service, Iowa Department of Agriculture, Oregon Department of Agriculture, University of Connecticut, University of Kansas, and the University of Michigan.
- Handled 703 pest calls, 268 pest specimens, and 55 literature requests. All pest specimen information was entered into the Northeast Plant Diagnostic Network database.
- Provided 12 youth educational programs, 10 adult educational programs, and two media interviews on various arthropod and/or pest-related topics.

### Forest Health Protection Programs (FHP)

#### Forest Insect and Disease Survey and Detection Programs

**Insects**

- Conducted hemlock woolly adelgid surveys detecting HWA in two new counties: Pleasants and Marshall Counties.
- Treated 1,981 hemlock trees for hemlock woolly adelgid. (376 trees on private lands for the HWA Cooperative Program, 1,370 trees at Cathedral State Park in Preston County and 235 trees at the WVU Botanical Garden in Monongalia County.
- Released 500 *Laricobius osakensis* for biological control of hemlock woolly adelgid, at Coopers Rock State Park. The plan is to continue augmenting this population for purposes of establishing a viable colony at the site.
- Treated 50 ash trees for emerald ash borer at Tomlinson Run State Park in Hancock County.

**Diseases**

- Conducted trapping for the walnut twig beetle (vector of Thousand Cankers Disease) to determine if the beetle is present in the state. Traps were set in high risk areas such as wood products locations, parks and campgrounds. A total of 47 traps were set and were monitored for four weeks in the spring and for three weeks in the fall. All samples were processed and screened by the forest pathologist and the Cooperative Forest Health Specialist. To date, all samples are negative for WTB.
- Established nine beech monitoring sites containing a minimum number of 20 beech trees in a stand to monitor the expansion of the known range of beech bark disease. Also, to evaluate over time the quantity of putatively resistant beech and the possible dynamic nature of BBD within these discrete areas and to identify putatively scale resistant American beech.
- Processed numerous samples submitted by WVDA personnel for the *Phytophthora ramorum* Nursery Survey and the Stone Fruit Commodity Survey. Also processed various samples submitted by forest health specialists and the public using various diagnostic tools such as: PCR, ELISA, culturing, and microscopy.
Received certification through USDA-APHIS-PPQ-CPHST to perform USDA-APHIS-PPQ validated diagnostic tests for *Phytophthora ramorum* and Plum Pox Virus.

**Gypsy Moth Program**

The West Virginia Department of Agriculture (WVDA) Gypsy Moth Program is the largest Forest Health Protection (FHP) program under the WVDA. It is divided into two parts; the Gypsy Moth Cooperative Suppression (GMCS) and Slow the Spread (STS) Programs, both of which are carried out in cooperation with the USDA-FS. Under the GMCS Program umbrella with the USDA-FS, the WVDA conducts the Cooperative State-County-Landowner (CSCL) Program in the generally infested area of the state. The STS Program operates in the transition zone between the leading edge of the main infestation and the uninfested zone where adult males are only occasionally found.

The West Virginia Department of Agriculture has two objectives in its Gypsy Moth Program; first, to retard the spread of the pest into uninfested areas of the state through the Gypsy Moth Slow the Spread (STS) Program and, second, to suppress gypsy moth populations in infested areas to limit, as much as possible, defoliation and tree mortality through the WVDA Gypsy Moth Cooperative State County Landowner (CSCL) Program. The WVDA Gypsy Moth Program minimizes the adverse impact on West Virginia's forest resources; we preserve aesthetic values, and protect people from the annoyance and health problems that can occur when in contact with large numbers of gypsy moth caterpillars.

**GMCS Accomplishments:**

- FHTET Forest Disturbance Mapper and ground observations were used to survey for gypsy moth defoliation. No significant gypsy moth defoliation was found.
- Ground surveyed 343,290 acres of private and state lands in West Virginia signed up by landowners and managers.
- Completed gypsy moth treatments on 974 acres in one county.
- Completed 3,877 1/40 acre plot gypsy moth egg mass density surveys.
- Visited 6,010 landowners to survey for gypsy moth presence.
- Set up and manned multiple gypsy moth displays at local county fairs and published multiple gypsy moth articles.
- Presented numerous gypsy moth invasive species presentations at schools, clubs, and campgrounds.

**STS Accomplishments:**

- Trapped 29,149 male gypsy moths in 2014, compared to 57,062 male moths in 2013.
- Placed 3,349 gypsy moth traps.
- No Treatments were proposed for 2014
- Set up and manned displays at The WV Hunting and Fishing Show and the WV Sport Show.

**Geographic Information System (GIS) Support**

The Geographic Information System (GIS) Specialist supports all Plant Industries Division programs.

- Provided computer systems operation and data management support, as well as map production for male gypsy moth detection surveys, gypsy moth and other forest defoliator surveys and forest pest suppression operations.
- Provided data management support, as well as map production and GIS analysis for FHP and CAPS surveys, reports and presentations.
- Incorporated the new USDA-FS Forest Disturbance Monitor to map and ground survey statewide forest disturbances in near real time.
- Provided spatial data management and maps for NPDES permit process.