

Indiana Cooperative Agricultural Pest Survey

2014 Semi Annual Report

1 January – 30 June



Department of Entomology at Purdue University
Indiana Department of Natural Resources (IDNR)
United State Department of Agriculture (USDA), Animal and Plant Health Inspection Service
(APHIS), Plant Protection and Quarantine (PPQ)

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CAPS 2014 Semi Annual Report

| | |
|---|---|
| Year: | 2014 |
| State: | IND |
| Cooperative Agreement Name: | Indiana Agricultural Pest Surveys (CAPS) 2014 |
| Cooperative Agreement Number: | 14-8218-0332-CA |
| Project Funding Period: | 1 January 2014 – 31 December 2014 |
| Project Report: | CAPS Semi-Annual Report |
| Project Document Date: | 31 July 2014 |
| Cooperators Project Coordinator: | Larry W. Bledsoe |
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| | |
|-----------------------------------|-------------------------------------|
| Quarterly Report | <input type="checkbox"/> |
| Semi-Annual Accomplishment Report | <input checked="" type="checkbox"/> |
| Annual Accomplishment Report | <input type="checkbox"/> |

A. Compare actual accomplishments to objectives established as indicated in the workplan. When the output can be quantified, a computation of cost per unit is required when useful.

Objective 1. Maintain a State Cooperative Agricultural Pest Survey Committee that will meet at least once a year to discuss fostering goals of CAPS.

1a. State CAPS Primary Committee:

Cooperative Agreement Representative Philip Marshall
 State Plant Regulatory Official (SPRO): Indiana Department of Natural Resources
 Division of Entomology and Plant Pathology
 402 West Washington, Room W-290
 Indianapolis, Indiana 46204

State Plant Health Director (SPHD): Gary Simon
 USDA APHIS PPQ
 1305 Cumberland Ave, Suite 102
 West Lafayette, Indiana 47906

Department of Entomology (Department Head) Dr. Steve Yaninek
 901 West State Street
 West Lafayette, Indiana 47907

Indiana State Survey Coordinator (SSC): Larry W. Bledsoe
 Purdue University, Department of Entomology
 901 West State Street
 West Lafayette, Indiana 47907

1b. Full committee

| Name | Organization | Discipline |
|---------------------|----------------------------|-----------------------------------|
| Bruce Bordelon | Purdue University | Horticulture |
| Tom Creswell | Purdue University | Plant Disease Diagnostics |
| Dr. Peter Hirst | Purdue University | Horticulture |
| Dr. Jeffery Holland | Purdue University | Entomology, Forest Landscape Ecol |
| Michelle Mikula | USDA-APHIS | Pest Survey Specialist |
| Dr. Chris Oseto | Purdue University | Entomology/ Identification |
| Gail Ruhl | Purdue University | Plant Disease Diagnostics |
| Dr. Cliff Sadof | Purdue University | Ornamental Pests/ Identification |
| Susan Schechter | Purdue University | National Ag Pest Information Svc |
| Dr. Robert Waltz | Purdue University | Indiana State Chemist |
| Cloyce Hedge | IN Dept. Natural Resources | Plant Ecology/ Identification |
| Ellen Jacquart | The Nature Conservancy | Plant Ecology/ Identification |

1c. Committee Meetings:

10 June 2014. Full committee: purpose - 2014 review and 2015 planning.

Objective 2. Cooperate with agencies carrying out field surveys, trapping, and data collection, setting emphasis on pest/diseases particularly identified that may pose an immediate risk to agriculture. SSC responsible for coding and uploading Indiana information to NAPIS database.

2a. Emerald ash borer, *Agrilus planipennis*. (IDNR) Visual surveys

| | | | | |
|--|----------|-------|-----|-----|
| Date Range: 01-01-2014 thru 06-30-2014 | | | | |
| Target Pest | Counties | Sites | Pos | Neg |
| Emerald Ash Borer | 6 | 15 | 15 | 0 |

2b. Brown Marmorated Stink Bug, *Halyomorpha halys*. (PU) General observation.

| | | | | |
|--|----------|-------|-----|-----|
| Date Range: 01-01-2014 thru 06-30-2014 | | | | |
| Target Pest | Counties | Sites | Pos | Neg |
| Brown Marmorated Stink Bug | 5 | 5 | 5 | 0 |

Objective 3. Have representation at National and/or Regional annual meetings.

3a. SSC was not able to attend the Central Plant Board Annual Meeting, Rapid City SD (4-8 May) due to prior commitments and federal funding rescission.

Objective 4. Utilize Cooperator and APHIS program funding, as outlined in the Financial Plan within the authorized parameters to support survey activities.

4a. Soybean Commodity Survey:

Proposed data for the Soybean Commodity Survey are 4 sites X 4 pests X 5 traps/pest X 12 dates = 960 records. Proposed funding for this survey was \$4,722 and actual funding is \$4,722.*

| | |
|---|------------------------------|
| | Samples received to 30 June. |
| 1. Old World Bollworm, <i>Helicoverpa armigera</i> , | 130 |
| 2. Egyptian cottonworm, <i>Spodoptera littoralis</i> | 130 |
| 3. Silver Y-moth <i>Autographa gamma</i> | 130 |
| 4. Summer fruit tortrix, <i>Adoxophyes orana</i> | 130 |
| 5. Golden twin-spot moth, <i>Chrysodeixis chalcites</i> | <u>130</u> |
| Sub total | 650 |

4a1. Survey Methodology (trapping protocol): Survey methods were adapted from the CAPS Pest Risk Assessment publication by Vennette, et al. 2003. Mini Risk Assessment, Old World Bollworm *Helicoverpa armigera*, Hubner [Lepidoptera : Noctuidae] and the CAPS Soybean Commodity Guidelines (25 July 2007). Four high-risk trap sites (Tippecanoe, Knox, Randolph, and La Porte Counties) that have high concentrations of grain crops (soybean and field corn) were chosen for this survey. Trap numbers and types placed at each site include: five bucket traps (green/yellow/white) with lure and kill strips for each of old world

bollworm, *Helicoverpa armigera*, Egyptian cottonworm, *Spodoptera littoralis*, and silver Y-moth *Autographa gamma*; five red paper delta traps (2 sides sticky with ends open) with lure for summer fruit tortrix, *Adoxophyes orana*; and five wing traps with lure for golden twin-spot moth, *Chrysodeixis chalcites*. Traps were set on 12-13 May and have been serviced weekly through the end of the reporting period.

4a2. Survey locations and dates;

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 13 May.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 12 May.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 12 May,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 13 May.

Trap period extends weekly to mid August (at least 12 sample dates).

4a3. Benefits and Results of Survey:

As in previous years, several species of endemic tortricid and noctuid moths have responded to the specific pheromones resulting in large numbers of moths to screen. The endemic *Helicovera zea* is highly attracted to the *H. armigera* lure. This has resulted in about 100 specimens for *Helicoverpa spp* alone received by 30 June that require screening by micro-dissection. Several endemic tortricids attracted to the target lures resulted in about 150 similar moths needing screening by morphology and/or dissection. No target species have been identified.

4a4. Database submissions: Negative data have not been uploaded as of the end of reporting period

4b. Corn Commodity Survey:

Proposed data for the Corn Commodity Survey insect records are 4 sites X 2 pests X 5 traps/pest X 12 dates = 480 records; +75 sites X 3 pests X 1 visit=225 records. Total records=705. Proposed funding for this survey was \$4,722 and actual funding is \$4,722.*

| Targets | Samples received to 30 June. |
|---|------------------------------|
| 1. Old World Bollworm, <i>Helicoverpa armigera</i> | 130 |
| 2. Egyptian cottonworm, <i>Spodoptera littoralis</i> | 130 |
| 3. Silver Y-moth <i>Autographa gamma</i> | <u>130</u> |
| | sub total 390 |
| | |
| 4. brown stripe downy mildew, <i>Sclerophthora. rayssiae</i> var. <i>zeae</i> | 38 |
| 5. Philippine downy mildew <i>Peronosclerospora philippinensis</i> | 38 |
| 6. Java downy mildew, <i>Peronosclerospora maydis</i> | <u>38</u> |
| | sub total 114 |

4b1. Survey Methodology (Moth trapping protocol): For moth portion of the survey, five bucket traps for each of adult silver Y-moth *A. gamma*, old world bollworm,

H. armigera, and Egyptian cotton leafworm, *S. littoralis* were deployed on 12-13 May at 4 high-risk sites. All traps were deployed according to recommendations in the Corn Commodity Survey Guidelines (August 2010) and the CAPS Approved Methods. Disease targets including brown stripe downy mildew, *S. rayssiae* var. *zeae*, Philippine downy mildew, *P. philippinensis*, and Java downy mildew, *P. maydis* will be sampled in about 20 counties from about mid May through mid August. These samples will be received and screened by Purdue Plant and Pest Diagnostic Laboratory.

4b2. Moth survey locations and dates;

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 13 May.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 12 May.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 12 May,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 13 May.

Trap period extends weekly to mid August (at least 12 sample dates).

4b3. Benefits and Results of Survey:

The endemic *Helicovera zea* is highly attracted to the *H. armigera* lure. This has resulted in about 100 specimens for *Helicoverpa* spp received by 30 June that require screening. Various endemic *Spodoptera* and *Autographa* spp. (loopers) attracted to the target lures resulted in about 150 moths needing screening by morphology and/or dissection. Screening requires several months. No target species have been identified.

4b4. Database submissions: Negative data have not been uploaded as of the end of reporting period

4c. Nursery and Retail Plants Survey. This is a collaborative survey between Indiana DNR (IDNR), Purdue University Plant Pest Diagnostic Laboratory (P&PDL) and CAPS.

Proposed total boxwood blight records are 45 sites x 10 plants=450. Proposed total data collections for sudden oak death (SOD) are 20 sites x 10 plants x 2 visits = 400 plants (records). Proposed *Helicoverpa armigera* records are 45 sites X 6 visits=270. Proposed funding for this survey was \$17,330 and actual funding is 17,330.*

| Target records | Samples/records received to 30 June. |
|--|--------------------------------------|
| 1. old world bollworm, <i>Helicoverpa armigera</i> | 40 |
| 2. boxwood blight <i>Cylindrocladium pseudonaviculatum</i> | 0 |
| 3. sudden oak death, <i>Phytophthora ramorum</i> | 247 |

4.c1 Survey Methodology: This survey is integrated with the annual plant nursery and retail outlet inspections conducted by Indiana Department of Natural Resources. A subset of 45 from 363 possible sites are being sampled in 2014. State nursery

inspectors set and monitored traps for old world bollworm, *H. armigera*, observed and sampled foliage of ornamental boxwood cultivars, *C. pseudonaviculata*, and observed and sampled a wide range of susceptible perennial plant foliage for *P. ramorum*. Moth samples were sent to the SSC (Dept. of Entomology) and foliar samples were sent to Purdue University Plant Pest & Disease Laboratory. For moth survey, bucket traps were deployed at 45 nurseries and/or retail plant outlets. One plastic bucket trap with lure and kill strip per were placed per site for old world bollworm in mid May. Sample interval is biweekly from mid May through mid August. *P. ramorum* samples were tested using an enzyme-linked immunosorbent assay (ELISA) consistent with the Nursery Survey Manual (Revised April 30, 2007) USDA-PPQ. Confirmation testing (PCR) of suspect samples was performed by Michigan State University.

4c2. Survey locations and dates.

Potentially 79 locations (variable) sampled mid April to mid August.

4c3 Benefits and Results of Survey: The USDA National Agricultural Statistics Service (September 2007) estimated the value of nursery production in 2006 as \$4.65 billion for the 17 top producing states. This increased 17 percent over the previous 3 years, for operations with \$100,000 or more in sales in those states that were surveyed. Those producers with sales of \$10,000 or more paid total gross wages of \$1.41 billion to employees. In 2011, the National Garden Association estimated that household participation in do-it-yourself lawn and garden improvement increased by 3 million households compared with the year before, translating into an extra \$688 million (2%) in retail sales across the nation. In total, U.S. households spent \$29.1 billion on their lawns and gardens last year. In 2007, the Indiana nursery industry had \$126,241,000 in sales (USDA Census of Ag). No target species have been identified.

4c4. Database submissions: Negative data have not been uploaded as of the end of reporting period

4d: Exotic Woodborers/Bark Beetles Survey (risk-based) (in cooperation with PPQ statewide trapping network). Proposed data collection for the risk based exotic woodborers/bark beetles survey are Alpha-pine ETOH lures = 35 sites X 7 visits X 1 pests = 245 records; IPS Trilure = 35 sites X 7 visits X 3 pests = 735 records; P. quercivorus lure = 20 sites X 7 visits X 1 pest=140 records; Lineatin lure = 20 sites X 7 visits X 1 pest=140 records; Chalcogran lure = 5 sites X 7 visits X 1 pest =35 records (1295 total records). Proposed funding for this survey was \$4,232 and actual funding is \$4,232.*

| Target records | Samples received to 30 June in process. |
|--|---|
| 1. Japanese pine sawyer beetle, <i>Monochamus alternatus</i> | 62 |
| 2. sixtoothed bark beetle, <i>Ips sexdentatus</i> | 41 |

| | |
|---|-----------|
| 3. European spruce bark beetle, <i>Ips typographus</i> | 41 |
| 4. Mediterranean pine engraver, <i>Orthotomicus erosus</i> | 41 |
| 5. sixtoothed spruce bark beetle, <i>Pityogenes chalcographus</i> | 12 |
| 6. Oak ambrosia beetle, <i>Playpus quercivorus</i> | 21 |
| 7. European hardwood ambrosia beetle <i>Trypodendron domesticum</i> | <u>39</u> |
| Subtotal | 257 |

4d1. Survey Methodology (trapping protocol): These surveys were an APHIS-PPQ/CAPS collaborative effort. PPQ set up and sampled traps and CAPS processed, identified, and archived samples. Exotic Woodborer/Bark Beetle National Survey Guidelines, July 2011, were followed.

a. Wet cup Lindgren funnel traps were deployed at 60 Indiana sites representing 29 counties plus 1 site-county in extreme southern Michigan. Data will be forwarded to the Michigan SSC. Sites were identified by recognition of apparent risk of receiving target pests through commerce. One to three (varies by site) Lindgren funnel traps containing dilute propylene glycol antifreeze were placed at each site. Traps contained one of the following lures: UHR alpha-pinene+ethanol, Chalcogran, Lineatin, Quercivorus, or IPS Tri-lure. Trap samples dated from 26 April to 6 June have been received and processed, and are awaiting final screen.

4d2. Survey location and dates: Traps are located at 60 Indiana sites representing 29 counties plus 1 site (county) in extreme southern Michigan. Traps were deployed approximately 11 April to 16 June. Traps are serviced about every two weeks until early-October.

4d3. Benefits and results of survey: In Indiana, over 4.3 million acres of high quality hardwood forests support an industry which employs 47,000 Hoosiers. These hardwood forests are at risk of exotic invasive bark beetles and other wood boring insects. Businesses and warehouses in Indiana that receive exotic, solid wood packing material (SWPM) represent potential focal points of pest introduction into the United States. The intent of this survey is early detection of threats to the forest products industry. CAPS staff has screened specimens from about 257vials as of 30 June. No target species have been identified as of the end of reporting period.

4d4. Database submissions: Negative data have not been uploaded as of the end of reporting period.

B. If appropriate, explain why objectives were not met.

All objectives for reporting period (1 January to 30 June) were met.

C. Where appropriate, explain any cost overruns or unobligated funds in excess of \$1,000.

not applicable

D. Supporting Documents (if applicable)
None attached

**indicates information is required per 7 CFR 3016.40 and 7 CFR 3019.51*

Approved and signed by

Philip T. Marshall (Cooperator)

Date: _____

Gary W. Simon (ADODR)

Date: _____