

# Indiana Cooperative Agricultural Pest Survey

## 2012 Annual Report

1 January – 31 December



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)

Prepared by Larry W. Bledsoe  
Department of Entomology  
Purdue University

12 March 2013

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| <u>Objective 4.</u> Utilize cooperator and APHIS program funding, as outlined in the financial plan within the authorized parameters to support survey and detection activities. In addition, specific appropriated funding in the level authorized by the PPQ Eastern Region will be dedicated to the delivery of CAPS surveys.    |                |
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**CAPS 2012 Annual Report**

|   |   |
|---|---|
| <b>Year:</b>                            | 2012  |
| <b>State:</b>                           | INDIANA                                       |
| <b>Cooperative Agreement Name:</b>      | Indiana Agricultural Pest Surveys (CAPS) 2012 |
| <b>Cooperative Agreement Number:</b>    | 12-8218-0332-CA                               |
| <b>Project Funding Period:</b>          | 1 January 2012 – 31 December 2012             |
| <b>Project Report:</b>                  | CAPS Infrastructure Annual Report             |
| <b>Project Document Date:</b>           | 31 March 2012                                 |
| <b>Cooperators Project Coordinator:</b> | Larry W. Bledsoe                              |
| <b>Name:</b>                            | Philip Marshall                               |
| <b>Agency:</b>                          | Indiana Department of Natural Resources       |
| <b>Address:</b>                         | 402 West Washington, Room W-290               |
| <b>City/ Address/ Zip:</b>              | Indianapolis, Indiana 46204                   |
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|                                   |                                     |
|-----------------------------------|-------------------------------------|
| Quarterly Report                  | <input type="checkbox"/>            |
| Semi-Annual Accomplishment Report | <input type="checkbox"/>            |
| Annual Accomplishment Report      | <input checked="" 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 |
| Dr. Ray Martyn      | Purdue University          | Center for Crop Bio-security      |
| 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:

12 June 2012. Full committee: Agenda-2012 review and 2013 planning

Objective 2. Cooperate with state and federal 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: 01-01-2012 thru 12-31-2012

Counties 23 Sites 23 Pos 65 Neg 0

2b. Gypsy Moth, *Lymantria dispar*. (IDNR, USFS and PPQ)

Date Range: 01-01-2012 thru 12-31-2012

Counties, delta 81, carton 20 Positive sites 756, Negative sites 8,717

2c. European Hardwood Ambrosia Beetle *Trypodendron domesticum*. (PPQ)

Date Range: 01-01-2012 thru 12-31-2012

Counties 10 Sites 15 Pos 0 Neg 104

2d. Chinese longhorned beetle, *Trichoferus campestris*. (PPQ)

Date Range: 01-01-2012 thru 12-31-2012

Counties 6 Sites 25 Pos 0 Neg 175

2e. Karnal Bunt, *Tilletia (Neovossia) indica*. (PPQ)

Date Range: 01-01-2012 thru 12-31-2012

Counties 15 Sites n/a Pos 0 Neg 26

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

3a. SSC was not able to attend Central Plant Board Annual Meeting, Traverse City, MI (3-7 June) due to prior commitments. No Annual meeting was held.

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 were 1,200 records.

Actual data were 1,200 records.

Proposed and actual funding for this survey was \$5,943.\*

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 that have high concentrations of grain crops (soybean and field corn), vegetable (primarily tomato, sweet bell pepper, and sweet corn), and

alfalfa hay were chosen for this survey. Trap numbers and types placed at each site include: five universal 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 14-17 May and were serviced weekly through the end of the reporting period.

4a2. Survey locations and dates;

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 14 May.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 17 May.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 16 May,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 14 May.

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

4a3. Benefits and Results of Survey:

No target species were recovered. 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. This has resulted in many hundreds specimens for endemic *Helicoverpa spp* alone received and screened by micro-dissection.

4a4. Database submissions:

Old world bollworm, *Helicoverpa armigera*,  
 Date Range: 01-01-2012 thru 12-31-2012  
 Counties 4 Sites 4 Pos 0 Neg 240

Egyptian cottonworm, *Spodoptera littoralis*,  
 Date Range: 01-01-2012 thru 12-31-2012  
 Counties 4 Sites 4 Pos 0 Neg 240

Silver Y-moth *Autographa gamma*;  
 Date Range: 01-01-2012 thru 12-31-2012  
 Counties 4 Sites 4 Pos 0 Neg 240

Summer fruit tortrix, *Adoxophyes orana*; and  
 Date Range: 01-01-2012 thru 12-31-2012  
 Counties 4 Sites 4 Pos 0 Neg 240

Golden twin-spot moth, *Chrysodeixis chalcites*.  
 Date Range: 01-01-2012 thru 12-31-2012  
 Counties 4 Sites 4 Pos 0 Neg 240

4b: Risk-based survey for exotic woodborers/bark beetles (in cooperation with PPQ statewide trapping network). Chinese longhorn beetle visual, and European hardwood ambrosia beetle trapping surveys are being informally bundled with the funded wood borer/bark beetle survey.

Proposed risk based exotic woodborers/bark beetles survey = 4000 records.

Actual data collection = 4,742 records

Proposed and actual funding for this survey was \$6,169.\*

4b1. 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. Survey targets are Redhaired pine bark beetle, *Hylurgus ligniperda*; lesser spruce shoot beetle, *Hylurgops palliatus*; sixtoothed bark beetle, *Ips sexdentatus*; European spruce bark beetle, *Ips typographus*, Japanese pine sawyer beetle, *Monochamus alternatus*, Mediterranean pine engraver, *Orthotomicus erosus*; sixtoothed spruce bark beetle, *Pityogenes chalcographus*; pine shoot beetles *Tomicus destruens* and *T. piniperda*.

- a. One hundred fifty wet cup Lindgren traps were deployed at 50 sites in 31 counties. Sites were identified by recognition of apparent risk of receiving target pests through commerce. Three to four (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, UHR alpha-pinene+ethanol, and IPS Tri-lure.
- b. Non work plan Chinese longhorn beetle survey was bundled at 25 sites in 5 counties using approved visual methods.
- c. Non work plan European hardwood ambrosia beetle survey was bundled at 15 sites in 10 counties using Lineatin lure in Lindgren funnel wet cup traps.

4b2. Survey dates: Traps from the exotic woodborers/bark beetles survey were in serviced in southern Indiana from 9 March to 2 October; 4 May to 15 October in central Indiana and from 23 April to 16 August in northern Indiana. Traps were serviced about every two weeks.

4b3. Benefits and results of survey: One positive record was recovered for the low risk pine shoot beetle, *Tomicus piniperda*. No high-risk species were recovered. In Indiana, over 4.3 million acres of high quality hardwood forests support an industry which employs 47,000 Hoosiers.

4b4. Database submissions:

Redhaired pine bark beetle, *Hylurgus ligniperda*;

Date Range: 01-01-2012 thru 12-31-2012

Counties 31 Sites 74 Pos 0 Neg 698

Lesser spruce shoot beetle, *Hylurgops palliatus*

Date Range: 01-01-2012 thru 12-31-2012

|  |          |       |         |
|--|----------|-------|---------|
| Counties 31  | Sites 74 | Pos 0 | Neg 698 |
| Sixtoothed bark beetle, <i>Ips sexdentatus</i>                 |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 27  | Sites 49 | Pos 0 | Neg 523 |
| European spruce bark beetle, <i>Ips typographus</i>            |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 27  | Sites 49 | Pos 0 | Neg 523 |
| Japanese pine sawyer beetle, <i>Monochamus alternatus</i>      |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 27  | Sites 49 | Pos 0 | Neg 523 |
| Mediterranean pine engraver, <i>Orthotomicus erosus</i>        |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 27  | Sites 49 | Pos 0 | Neg 523 |
| Sixtoothed spruce bark beetle, <i>Pityogenes chalcographus</i> |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 4   | Sites 4  | Pos 0 | Neg 33  |
| Pine shoot beetle, <i>Tomicus destruens</i>                    |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 31  | Sites 74 | Pos 0 | Neg 698 |
| Pine shoot beetle, <i>Tomicus piniperda</i> .                  |          |       |         |
| Date Range: 01-01-2012 thru 12-31-2012                         |          |       |         |
| Counties 27  | Sites 49 | Pos 1 | Neg 522 |

- 4c. *Phytophthora ramorum* National Nursery Survey, (Sudden oak death foliar survey). This is a collaborative survey between Indiana DNR (IDNR), Purdue University Plant Pest Diagnostic Laboratory (P&PDL) and CAPS.

Proposed data collection = 400 samples.

Actual collection = 400 records. (369 foliar sample representing 16 counties and 31 prenotification samples in 9 counties).

Proposed and actual funding for this survey was \$15,791.\*

- 4c1. Survey Methodology: IDNR personnel selected symptomatic parts of *Camellia*, *Rhododendron*, *Viburnum*, *Pieris*, and *Kalmia* (generally) from Indiana nurseries and other landscape plant retail outlets to test for the presence of *P. ramorum*. Samples were tested using an enzyme-linked immunosorbent assay (ELISA) consistent with the *Phytophthora ramorum* Nursery Survey Manual (Revised April 30, 2007) USDA-PPQ. Confirmation testing (PCR) of suspect positive samples was performed by Michigan State University and/or USDA CPHST.

- 4c2. Survey dates: First sample was collected 4 April and the last sample in the reporting period was 14 September.



4c3. Benefits and results of survey: There were 399 negative and 1 positive records. The positive record is considered eradicated. Monitoring by IDNR continues. In Indiana, over 4.3 million acres of high quality hardwood forests support an industry which employs 47,000 Hoosiers. According to the Indiana University Center for Urban Policy and the Environment, the horticulture industry employed over 25,700 employees and paid \$5.66 for every \$1,000 in total Indiana wages paid in 2004. Further, the total economic contribution in 2004 attributable to the horticultural industry in Indiana was nearly \$2.05 billion. If *P. ramorum* is detected in Indiana, rapid response would limit the spread of the pathogen and to prevent its introduction into nursery and forest products industries.

4c4. Database submissions:

Sudden Oak Death, *Phytophthora ramorum*;

Date Range: 01-01-2012 thru 12-31-2012

Counties 16 Sites n/a Pos 1 Neg 368

Sudden Oak Death, *Phytophthora ramorum*; Prenotification

Date Range: 01-01-2012 thru 12-31-2012

Counties 9 Sites n/a Pos 0 Neg 31

4d. Oak Commodity Survey: This is a survey of the Wabash River, White River and Muscatatuck River watersheds for exotic lepidopteran pests of oak. Public and private land was surveyed.

Proposed data collection =200 records.

Actual data collection = 232 records.

Proposed and actual funding for this survey is \$5,879.\*

4d1. Survey Methodology: This survey is integrated with a current hardwood pest-monitoring program under the direction of Dr. Jeffery Holland, assistant professor of spatial ecology and biodiversity, Purdue University. Methods were adapted according to the Oak Commodity Survey Guidelines, revised 2010. Ten hardwood sites in 9 counties that had been harvested within the last 2 to 4 years were surveyed. One set of traps was placed at each site. Traps with lure were placed between 10 to 27 May and were serviced every 2-3 weeks. Trap interval varied by location. Appropriate traps (bucket, wing and delta) with lures for exotic lepidopteran pests, summer fruit tortrix, *Adoxophyes orana*; green oak tortrix, *Tortrix veridana*; variegated golden tortrix, *Archips xylosteanus*; and Egyptian cottonworm, *Spodoptera littoralis*, were included at all sites

4d2. Survey dates: Traps were placed between 10 to 18 May and are serviced every 2-3 weeks. Last samples were collected 15 August.

4d3. Benefits and results of survey: No target pests were detected. In Indiana, over 4.3 million acres of high quality hardwood forests support an industry which

employs 47,000 workers. Indiana has 22 species of oak that constitute a major component of its hardwood forests. This survey is expected to result in the early detection of exotic oak pests in Indiana hardwoods.

4c4. Database submissions:

Summer fruit tortrix, *Adoxophyes orana*

Date Range: 01-01-2012 thru 12-31-2012

Counties 9 Sites 10 Pos 0 Neg 58

Green oak tortrix, *Tortrix veridana*

Date Range: 01-01-2012 thru 12-31-2012

Counties 9 Sites 10 Pos 0 Neg 58

Variiegated golden tortrix, *Archips xylosteanus*

Date Range: 01-01-2012 thru 12-31-2012

Counties 9 Sites 10 Pos 0 Neg 58

Egyptian cottonworm, *Spodoptera littoralis*,

Date Range: 01-01-2012 thru 12-31-2012

Counties 9 Sites 10 Pos 0 Neg 58

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

All objectives for reporting period (1 January to 31 December) were met.

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

All funds were expended with no cost overruns.

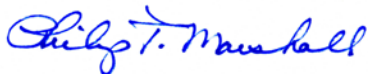
**D. Supporting Documents (if applicable)**

None attached

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*\*indicates information is required per 7 CFR 3016.40 and 7 CFR 3019.5*

Approved and signed by



Date: 3/27/2013

\_\_\_\_\_  
Philip T. Marshall (Cooperator)

Date: \_\_\_\_\_

\_\_\_\_\_  
Gary W. Simon (ADODR)