Indiana Cooperative Agricultural Pest Survey

2013 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)

Prepared by Larry W. Bledsoe
Department of Entomology
Purdue University

02 July 2013

Table of Contents

CAPS 2013 Semi Annual Report

Year:	2013
State:	IND
Cooperative Agreement Name:	Indiana Agricultural Pest Surveys (CAPS) 2013
Cooperative Agreement Number:	13-8218-0332-CA
Project Funding Period:	1 January 2013 – 31 December 2013
Project Report:	CAPS Semi-Annual Report
Project Document Date:	31 July 2013
Cooperators Project Coordinator:	Larry W. Bledsoe
Name:	Philip Marshall
Agency:	Indiana Department of Natural Resources
Address:	402 West Washington, Room W-290
City/ Address/ Zip:	Indianapolis, Indiana 46204
Telephone:	317-232-4189
E-mail:	pmarshall@dnr.IN.gov

Quarterly Report	☐
Semi-Annual Accomplishment Report	☒
Annual Accomplishment Report	☐

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:

11 June 2013. Full committee: purpose - 2013 review and 2014 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: 01-01-2013 thru 06-30-2013

Target Pest	Counties	Sites	Pos	Neg
Emerald Ash Borer	22	57	57	0

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

Date Range: 01-01-2013 thru 06-30-2013

Target Pest	Counties	Sites	Pos	Neg
Gypsy Moth (European)	1	1	1	0

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

Date Range: 01-01-2013 thru 06-30-2013

Target Pest	Counties	Sites	Pos	Neg
Brown Marmorated Stink Bug	1	1	1	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, Manhattan, KS (28 April - 2 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 $4,452 and actual funding is $3,540.*

	Samples received to 30 June.
1. Old World Bollworm, *Helicoverpa armigera*,	140
2. Egyptian cottonworm, *Spodoptera littoralis*	140
3. Silver Y-moth *Autographa gamma*	140
4. Summer fruit tortrix, *Adoxophyes orana*	140
5. Golden twin-spot moth, *Chrysodeixis chalcites*	140

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 7-9 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 8 May.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 7 May.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 9 May,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 6 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 torticid 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 200-300 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 150-250 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 3 pests X 5 traps/pest X 12 dates = 720 records. Proposed total disease samples = 225 records. Proposed funding for this survey was $4,606 and actual funding is $3,540.*

Targets	Samples received to 30 June.
1. Old World Bollworm, *Helicoverpa armigera,*	140
2. Egyptian cottonworm, *Spodoptera littoralis*	140
3. Silver Y-moth *Autographa gamma*	140
4. brown stripe downy mildew, *Sclerophthora. rayssiae* var. *zeae,*	49
5. Philippine downy mildew *Peronosclerospora philippinensis*	49
6. Java downy mildew, *Peronosclerospora maydis*	49

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 7-9 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 screen by Purdue Plant and Pest Diagnostic Laboratory.

4b2. Moth survey locations and dates;

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 8 May.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 7 May.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 9 May,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 6 May.

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

Corn disease samples have been submitted from 16 counties as of 30 June.

4b3. Benefits and Results of Survey:
The endemic *Helicovera zea* is highly attracted to the *H. armigera* lure. This has resulted in about 200 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 100-150 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 450. No data have been received by 30 June. Proposed total data collections for sudden oak death (SOD) are 400. Proposed *Helicoverpa armigera* records = 270. Proposed funding for this survey is $18,252 and actual funding was 17,202.*

Target records	Samples/records received to 30 June.
1. old world bollworm, *Helicoverpa armigera*	135
2. boxwood blight Cylindrocladium *pseudonaviculatum*	0
3. sudden oak death, *Phytophthora ramorum*	295

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 2013. 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. Disease targets were sampled in 20 to 40 counties Sample interval will be about 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 dates: mid April to 30 June.

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). Chinese longhorn beetle visual, and European hardwood ambrosia beetle trapping surveys are being informally bundled with the funded wood borer/bark beetle survey.

Proposed data collection for the risk based exotic woodborers/bark beetles survey are 50 sites X 10 visits X (8 pests) = 4000 records + 4 sites X 10 visits X 1 pest = 40 records. Proposed funding for this survey was $4,528 and actual funding is $3,100.*

Target records	Approx. samples/records received to 8 June.
1. Redhaired pine bark beetle, *Hylurgus ligniperda*	*138*
2. lesser spruce shoot beetle, Hylurgops palliates	138
3. sixtoothed bark beetle, Ips sexdentatus	138
4. European spruce bark beetle, Ips typographus	138
5. Japanese pine sawyer beetle, Monochamus alternatus	138
6. Mediterranean pine engraver, Orthotomicus erosus	138
7. sixtoothed spruce bark beetle, Pityogenes chalcographus	012
8. pine shoot beetle Tomicus destruens	138
9. pine shoot beetle T. pinniperda.	138

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 50 sites representing 29 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: low release alpha-pinene, UHR alpha-pinene+ethanol, Chalcogran, and IPS Tri-lure. Trap samples dated from 26 April to 6 June have been received and processed, and are awaiting final screen.
b. Chinese longhorn beetle survey was informally bundled at 25 sites in 5 counties using unapproved UHR ETOH in Lindgren funnel traps and approved visual methods. Trap samples dated from 27 May to 7 June have been received, processed, and awaiting final screen.
c. European hardwood ambrosia beetle survey was informally bundled at 15 sites in 9 counties using Lineatin lure in Lindgren funnel wet cup traps. Trap samples dated from 13 April to 8 June have been received and processed, and are awaiting final screen.

4d2. Survey dates: Traps from the exotic woodborers/bark beetles survey were deployed approximately 26 April to 8 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 150 vials 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.

4e. Oak Commodity Survey: This is a survey of the Wabash River and White River watersheds for exotic lepidopteran pests of oak. Public and private land was surveyed. Proposed data for the Oak Commodity Survey are 10 sites X 6 pests X 1 traps/pest X 5 sample dates = 300 records. Proposed funding for this survey is $5,405 and actual funding is $3,524.*

Targets	Samples/records received to 30 June.
1. summer fruit tortrix, *Adoxophyes orana*	*26*
2. green oak tortrix, *Tortrix viridana*	*26*
3. varigated golden Tortrix, *Archips xylosteanus*	*26*
4. Egyptian cottonworm, *Spodoptera littoralis*	*26*
5. goldspotted oak borer, *Agrilus auroguttatus*	*26*
6. oak splendour beetle, *Agrilus biguttatus*	*26*

4e1. 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 10 counties that had been harvested within the last 2 to 3 years were surveyed. One set of traps was placed at each site. Traps with lure were placed between 6 to 15 May and have been serviced every 2-3 weeks. 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. Purple prism traps (unbaited-visual counts) were deployed for goldspotted oak borer, *Agrilus auroguttatus* and oak splendour beetle, *Agrilus biguttatus.* Locations include Allen, Carroll, Montgomery, Randolph, Putnam, Ripley, LaPorte, Monroe, Morgan, and Brown Counties.

4e2. Survey dates: Traps were placed between 6 to 15 May and are serviced every 2-3 weeks. Last samples will be mid August.

4e3. Benefits and results of survey: 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. As of 30 June, no target species have been detected.

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.
Information not applicable for semi-annual report.

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

_____ Date: _____
Philip T. Marshall (Cooperator)

_____ Date: _____
Gary W. Simon (ADODR)