

# Indiana Cooperative Agricultural Pest Survey

## 2016 Annual Report for Survey

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

10 March 2017

**PURDUE**  
UNIVERSITY

*Purdue Extension*  
**Knowledge to Go**  
1-888-EXT-INFO

**IDNR**  
INDIANA DEPARTMENT OF  
NATURAL RESOURCES

**USDA**  
**APHIS**

**CAPS 2016 Annual Report - Survey**

<b>Year:</b>	2016
<b>State:</b>	INDIANA
<b>Cooperative Agreement Name:</b>	Indiana Agricultural Pest Surveys (CAPS) 2016
<b>Cooperative Agreement Number:</b>	16-8218-0332-CA
<b>Project Funding Period:</b>	1 January 2016 – 31 December 2016
<b>Project Report:</b>	Indiana CAPS Survey
<b>Project Document Date:</b>	30 March 2017
<b>Cooperators Project Coordinator:</b>	Larry W. Bledsoe
<b>Name:</b>	Megan L. Abraham
<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
<b>Telephone:</b>	317-234-5182
<b>E-mail:</b>	MAbraham@dnr.IN.gov

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 work plan. When the output can be quantified, a computation of cost per unit is required when useful.\***

Indiana Cooperative Agricultural Pest Surveys in 2016 are Soybean Commodity, Corn Commodity, bundled Nursery and Retail Plants, and taxonomic-grouped Exotic Wood Borer/Bark Beetle. All aspects of the Soybean Commodity survey are planned, executed and reported by the SSC. Only moth and invasive plant monitoring for the Corn Commodity survey is planned, executed and reported by the SSC. The disease monitoring portion of the Corn Commodity survey is a collaboration with the Purdue Plant Pest Diagnostic Laboratory (PPDL). Corn tissue samples are screened and tested by PPDL and the SSC reported data. The Nursery and Retail Plants survey is a collaborative effort of the SSC, Indiana Department of Natural Resources (IDNR), and PPDL. IDNR assisted in setting and servicing moth traps and obtaining foliar samples. PPDL screens foliar disease samples. The SSC assisted in survey planning/logistics, processing samples and archiving/reporting results. The Exotic Wood Borer/Bark Beetle survey is a collaborative effort with PPQ and the SSC. Pathway analysis was used to identify high-risk trap sites. PPQ co-planned the survey and set and serviced traps. The SSC co-planned the survey, processed and archived samples, and reported results. This survey (2016) was abbreviated due to the unexpected loss of PPQ funding for federal summer trap tenders. The work plan objectives included SSC reporting additional survey data from other state and federal-funded surveys to the NAPIS database.

Total survey program includes soybean commodity, corn commodity, nursery and retail plants, and exotic wood borer/bark beetle. The exotic wood borer/bark beetle survey is abbreviated due to loss of PPQ funding for trap tenders. Proposed and actual survey funding is \$31,012. Survey details follow.

**A1. Soybean Commodity Survey**

Objective 1. Utilize cooperator and APHIS program funding, as outlined in the financial plan to conduct a soybean commodity survey, process trap samples, and deliver results to the NAPIS database. The Cooperator will conduct a program that is expected to provide information about the presence or absence of potentially damaging exotic pests including old world bollworm, *Helicoverpa armigera*, silver Y-moth, *Autographa gamma*, Egyptian cotton leafworm, *Spodoptera littoralis*, golden twin spot moth, *Chrysodeceixis chalcites*, bean platispid, *Megacopta cribaria*, and yellow witchweed, *Alectra vogilii*.

**Accomplishments:**

Soybean commodity survey:

Proposed and actual funding was \$4,614.

Proposed data were 1,305 records. Actual data were 1,406 records.

Actual cost per record was \$3.28.

A.1.1 Survey Methodology: Survey methods for moths were adapted from the CAPS Soybean Commodity Guidelines (25 July 20007). Five high-risk trap sites with concentrations of grain crops (field corn and soybean), vegetables (primarily tomato, sweet bell pepper, and sweet corn), were identified. Five universal bucket traps

(green/yellow/white) with lures and kill strips were placed at each of five locations for old world bollworm, *Helicoverpa armigera*, silver Y-moth, *Autographa gamma*, Egyptian cotton leafworm, *Spodoptera littoralis*, and golden twin spot moth, *Chrysodeceixis chalcites*. Traps were set on 10-12 May and were serviced weekly through the end of the reporting period, 9 -11 August. Survey methods for bean plataspid were developed from Purdue University stink bug recommendations for soybean pest management <<https://extension.entm.purdue.edu/fieldcropsipm/soybean.php>> and 40 years experience in soybean entomological field research by the SSC. Random visual searches in soybean for yellow witchweed, *Alectra vogelii*, were about 10 minutes in duration per site/day.

A.1.2. Moth survey locations and dates;

Trap period extended weekly mid May to mid August (13 sample dates).

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 5/12.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 5/11.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 5/12,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 5/10.
5. Whitely Co. Northeast-Purdue Agricultural Center, Columbia City, set 5/12.

A.1.2. Continued: Bean plataspid survey locations and sample dates

- |                       |                        |
|-----------------------|------------------------|
| 1. Clark Co. 8/22     | 6. Lawrence Co. 8/24   |
| 2. Dubois Co. 8/23    | 7. Perry Co. 8/24      |
| 3. Floyd Co. 8/24     | 8. Posey Co. 8/23      |
| 4. Jefferson Co. 8/22 | 9. Vanderburg Co. 8/23 |
| 5. Jennings Co. 8/17  | 10. Warrick Co. 8/23   |

A.1.2. Continued: Yellow witchweed survey locations and sample dates

1. La Porte Co. 6/6, 7/21, 8,11
2. Knox Co. 6/8, 7/19, 8/9
3. Randolph Co. 6/9, 7/20, 8/10
4. Tippecanoe Co. 6/14, 7/21, 8/11
5. Whitely Co. 6/9, 7/20, 8/10

A.1.3. Benefits and Results of Survey:

No target species were recovered. As in previous years, several species of endemic noctuid moths responded to the specific pheromones resulting in large numbers of moths to screen by micro-dissection.

A.1.4. Database submissions:

Old world bollworm, *Helicoverpa armigera*,  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Egyptian cottonworm, *Spodoptera littoralis*,  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Silver Y-moth *Autographa gamma*;  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Golden twin spot Moth, *Chrysodiexis chalcites*,  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 127

Bean plataspid, *Megacopta cibaria*,  
Date Range: 08-17-2016 thru 8-24-2016  
Counties 11 Sites 66 Pos 0 Neg 66

Yellow witchweed, *Alectra vogelii*,  
Date Range: 07-13-2016 thru 7-17-2016  
Counties 5 Sites 4 Pos 0 Neg 20

\*\*\*\*\*

## A.2. Corn Commodity Survey

Objective 1. Utilize cooperator and APHIS program funding, as outlined in the financial plan to conduct a corn commodity survey, process trap samples, and deliver results to the NAPIS database. The Cooperator will conduct a program that is expected to provide information about the presence or absence of potentially damaging exotic pests including old world bollworm, *Helicoverpa armigera*, silver Y-moth, *Autographa gamma*, Egyptian cotton leafworm, *Spodoptera littoralis*, cotton cutworm, *Spodotera litura*, brown stripe downy mildew, *Sclerophthora rayssiae* var. *zeae*, Philippine downy mildew, *Peronosclerospora philippinensis*, and downy mildew, *Peronosclerospora maydis*, Asiatic witchweek, *Striga asiatica* and tar spot, *Phyllachora maydis* and Bacterial leaf streak, *Xanthomonas vasicola* pv. *vasiculorum*.

### Accomplishments:

Corn commodity survey:

Proposed and actual funding was \$6,749.

Proposed data were 1,600 records. Actual data were 2,114 records.

Actual cost per record was \$3.19.

A2.1. Survey Methodology: Survey methods for moths and diseases were adapted from the CAPS Corn Commodity Guidelines (23 July 2010). Five high-risk trap sites with high concentrations of grain crops (field corn and soybean), vegetables

(primarily tomato, sweet bell pepper, and sweet corn), were identified. Universal bucket traps (green/yellow/white) with lures and kill strips were placed at five locations at each of five sites (counties) for each of old world bollworm, *Helicoverpa armigera*, Egyptian cottonworm, *Spodoptera littoralis*, cotton cutworm, *Spodoptera litura* and silver Y-moth, *Autographa gamma*. Traps were set on 10-12 May and were serviced weekly through the end of the reporting period, 9 -11 August. Plant diseases (Java downy mildew, *Peronosclerospora maydis*, Philippine downy mildew, *Peronosclerospora philippinensis*, and brown stripe downy mildew, *Sclerophthora rayssiae* var. *zeae*) were assessed by testing symptomatic tissue from 51 counties in collaboration with the Purdue Plant Pest and Diagnostic Laboratory. Survey for Asiatic witchweed, *Striga asiatic*, in five counties was developed using the CABI Invasive Species Compendium website <<http://www.cabi.org/isc/datasheet/51786>>, “Approved Methods” for Yellow Witchweed, *Alectra vogelli*, and *S. asiatica* internet images. Tar spot, *Phyllachora maydis*, symptomatic tissue was laboratory confirmed in 9 counties. Samples of potential bacterial leaf streak, *Xanthomonas vasicola* pv. *vasiculorum* were collected by searching field corn at late summer for symptomatic leaf tissue. Sixty one samples were collected from 30 counties.

#### A.2.2. Moth survey locations and dates;

Trap period extended weekly mid May to mid August (14 sample dates).

1. La Porte Co. Pinney-Agricultural Center, Wanatah, IN, set 5/13.
2. Knox Co. Southwest-Purdue, Vincennes, IN, set 5/12.
3. Randolph Co. Davis-Purdue Agricultural Center, Farmland, IN, set 5/12,
4. Tippecanoe Co. Meigs-Purdue Horticultural Center, Lafayette, IN, set 5/13.
5. Whitely Co. Northeast-Purdue Agricultural Center, Columbia City, set 5/14.

#### A.2.2. Continued: Exotic mildew survey locations and sample dates

1. Adams Co. 8/31 (3)
2. Benton Co. 8/23 (2), 8/31 (5)
3. Boone Co. 8/23 (6), 8/24 (2)
4. Carroll Co. 6/1, 8/18, 9/20, 9/22
5. Cass Co. 6/2, 10/20
6. Clinton Co. 5/16, 8/9, 10/12
7. Daviess Co. 8/5
8. Decatur Co. 7/14
9. DeKalb Co. 8/4,
10. Elkhart Co. 7/26, 8/23 (4)
11. Fayette Co. 6/21
12. Fulton Co. 6/28
13. Gibson Co. 8/26 (2), 8/31 (3)
14. Hamilton Co. 6/17, 8/23 (2)
15. Harrison Co. 5/20, 8/2
16. Hendricks Co. 7/26, 8/23, 8/24, 8/25 (2), 10/20

17. Henry Co. 6/6
18. Huntington Co. 8/30, 8/19 (2)
19. Jasper Co. 8/25 (2), 9/13 (2)
20. Jay Co. 8/12 (2)
21. Knox Co. 8/30
22. Kosciusko Co. 6/1, 8/23 (2)
23. Lake Co. 8/16, 8/26 (2), 9/13 (4)
24. LaGrange Co. 8/25 (2), 9/6 (5)
25. La Porte Co. 6/30, 8/8, 8/12 (7), 8/22, 8/23, 9/13 (8)
26. Madison Co. 6/7, 6/16, 9/12
27. Marshall Co. 8/12, 9/1 (2), 10/12
28. Miami Co. 8/17 (2)
29. Montgomery Co. 8/19 (2), 8/23 (4)
30. Newton Co. 5/19, 8/23 (2), 8/25, 9/2 (2), 9/21, 10/20
31. Noble Co. 9/14, 8/23 (2)
32. Parke Co. 6/13
33. Pike Co. 8/5 8/24 (2)
34. Porter Co. 8/26 (2), 9/13 (2), 10/12
35. Posey Co. 8/24 (2)
36. Pulaski Co. 8/23, 8/30, 9/21
37. Putnam Co. 6/23
38. Shelby Co. 8/25 (2)
39. St. Joseph Co. 8/25 (4), 9/2
40. Starke Co. 6/2, 8/26 (2), 9/13 (4)
41. Steuben Co. 8/25 (2), 9/6 (6)
42. Sullivan Co. 7/18
43. Tippecanoe Co. 2/8, 3/2, 7/20, 8/1 (2), 9/7, 8/19 (2), 8/23 (13), 8/30 (2)
44. Tipton Co. 8/2, 8/14 (6)
45. Vigo Co. 5/12, 5/20, 5/18, 6/6, 9/16
46. Wabash Co. 6/1 (4)
47. Warren Co. 5/19 (2), 6/7, 8/23 (2), 8/31 (4)
48. Warrick Co. 8/22 (2)
49. Wells Co. 9/1 (2)
50. Whitley Co. 8/17
51. White Co. 5/27, 5/31, 6/13 (2), 7/13, 8/30, 9/21, 10/31

A.2.2. Continued: Asiatic witchweed survey locations and sample dates

1. La Porte Co. 6/6, 7/21, 8,11
2. Knox Co. 6/8, 7/19, 8/9
3. Randolph Co. 6/9, 7/20, 8/10
4. Tippecanoe Co. 6/14, 7/21, 8/11
5. Whitely Co. 6/9, 7/20, 8/10

A.2.2. Continued: Corn tar spot survey locations and sample dates

1. Carroll Co. 9/20, 9/22
2. Cass Co. 10/20
3. Clinton Co. 10/12
4. Hendricks Co. 10/20
5. Newton Co. 9/21, 10/20
6. Marshall Co. 10/12
7. Porter Co. 10/12
8. Pulaski Co. 9/21
9. White Co. 9/21

A.2.2. Continued: Bacterial leaf streak survey locations and sample dates

- |                                  |                             |
|----------------------------------|-----------------------------|
| 01. Adams Co. 8/31 (3)           | 16. Montgomery Co. 8/18 (4) |
| 02. Benton Co. 8/23 (2)          | 17. Newton Co. 9/2 (2)      |
| 03. Boone Co. 8/23 (2); 8/24 (2) | 18. Noble Co. 8/23 (2)      |
| 04. Gibson Co. 8/26 (2)          | 19. Pike Co. 8/24 (2)       |
| 05. Hendricks 8/23, 8/24         | 20. Porter Co. 8/26 (2)     |
| 06. Huntington Co 8/18 (2)       | 21. Posey Co. 8/24 (2)      |
| 07. Jasper Co. 8/30 (2)          | 22. Pulaski Co. 8/30        |
| 08. Jay Co. 8/12 (2)             | 23. Shelby Co. 8/25 (2)     |
| 09. Knox Co. 8/30                | 24. Starke Co. 8/26 (2)     |
| 10. Kosciusko Co. 8/23 (2)       | 25. Steuben Co. 8/25 (2)    |
| 11. Lagrange Co. 8/25 (2)        | 26. Warrick Co. 8/19 (2)    |
| 12. Lake Co. 8/26 (2)            | 27. Warren Co. 8/23 (2)     |
| 13. La Porte Co. 8/19            | 28. Wells Co. 9/1 (2)       |
| 14. Marshall Co. 9/1 (2)         | 29. White Co. 8/30          |
| 15. Miami Co. 8/17 (2)           | 30. Whitley Co. 8/17 (2)    |

A.2.3. Benefits and Results of Survey:

Tar spot was confirmed on commercial maize in nine counties. Purdue University Ex is providing management information. No other target species were recovered. As in previous years, several species of endemic noctuid moths responded to the specific exotic pheromones resulting in large numbers of moths to screen by micro-dissection.

A.2.4. Database submissions:

Old world bollworm, *Helicoverpa armigera*  
 Date Range: 05-10-2016 thru 8-11-2016  
 Counties 5 Sites 5 Pos 0 Neg 325



Egyptian cottonworm, *Spodoptera littoralis*  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Cotton cutworm, *Spodoptera litura*  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Silver Y-moth *Autographa gamma*  
Date Range: 05-10-2016 thru 8-11-2016  
Counties 5 Sites 5 Pos 0 Neg 325

Philippine downy mildew, *Peronosclerospora philippinensis*  
Date Range: 02-8-2016 thru 10-20-2016  
Counties 51 Sites 226 Pos 0 Neg 226

Java downy mildew, *Peronosclerospora maydis*  
Date Range: 02-8-2016 thru 10-20-2016  
Counties 51 Sites 226 Pos 0 Neg 226

Brown stripe downy mildew, *Sclerophthora rayssiae*  
Date Range: 02-8-2016 thru 10-20-2016  
Counties 51 Sites 226 Pos 0 Neg 226

Asiatic witchweed, *Striga asiatica*  
Date Range: 07-13-2016 thru 7-17-2016  
Counties 5 Sites 4 Pos 0 Neg 20

Tar spot, *Phyllachora maydis*,  
Date Range: 07-13-2016 thru 7-17-2016  
Counties 9 Sites 11 Pos 11 Neg 0

Bacterial leaf streak, *Xanthomonas vasicola* pv. *vasicolorum*  
Date Range: 08-12-2016 thru 9-02-2016  
Counties 30 Sites 61 Pos 0 Neg 61

\*\*\*\*\*

### A.3. Nursery and Retail Plants Survey

Objective 1. Utilize cooperator and APHIS program funding, as outlined in the financial plan to conduct a nursery and retail plant survey, process trap samples, and deliver results to the NAPIS database. The Cooperator will conduct a program that is expected to provide information about the presence or absence of potentially damaging exotic pests including

old world bollworm, *Helicoverpa armigera*, sudden oak death, *Phytophthora ramorum*, and boxwood blight, *Calonectria pseudonaviculata*.

Accomplishments:

Proposed and actual funding was \$18,415.

Proposed data were 970 records. Actual data were 889 records.

(*C. pseudonaviculata* records are represented by 106,025 plants)

Actual cost per record was \$20.71.

A.3.1. Survey Methodology: This survey was integrated with the annual plant nursery and retail outlet inspections conducted by Indiana Department of Natural Resources. State nursery inspectors set and monitored traps for old world bollworm, *H. armigera*, sampled foliage of ornamental boxwood cultivars (*Buxus spp.*) for boxwood blight, *C. pseudonaviculata*, and observed and sampled a wide range of susceptible perennial plant foliage for *P. ramorum* according to CAPS Approved Methods. Samples were sent either to Purdue University Plant Pest & Disease Laboratory or to the Department of Entomology. For the moth survey, traps were deployed and serviced at 45 nurseries and/or retail plant outlets. One plastic bucket trap (unitrap) with lure and kill strip was placed per site for old world bollworm, *H. armigera*, in May and serviced biweekly for 3 months. CAPS SSC prescreened suspect moths by micro dissection of male genitalia. Boxwood blight, *C. pseudonaviculata*, was assessed visually by examining plants grown and/or sold by dealers and nurseries. Symptomatic tissue was sent to Purdue Plant Pest and Diagnostic Laboratory. Potential host plants of Sudden Oak Death disease were sampled in 17 counties from May through August. Indiana Department of Natural Resource personnel selected potentially symptomatic parts of susceptible species from Indiana nurseries and other landscape plant retail outlets and sent to Purdue Plant Pest Diagnostic Laboratory to test for the presence of *P. ramorum*. Samples were tested using an enzyme-linked immunosorbent assay (ELISA) consistent with the *P. ramorum* Nursery Survey Manual (Revised April 30, 2007) USDA-PPQ. Confirmation testing (PCR) of suspect *Phytophthora spp.* positive samples was performed by Michigan State University.

The relatively high cost of this survey is due to the laboratory procedures required for screening and confirmation. Data are accessible through the NAPIS database.

A.3.2. Old world bollworm survey locations and dates;

- |                                      |   |
|--------------------------------------|---|
| 1. Allen Co. 5/6 - 8/25; 4 sites     | 11. LaPorte Co. 5/9 – 8/8; 3 sites      |
| 2. Boone Co. 5/12 - 8/15; 1 site     | 12. Lawrence Co. 5/6 – 7/27; 6 sites    |
| 3. Clark Co. 5/5 - 9/16; 2 sites     | 13. Marion Co. 5/27 – 8/15; 2 sites     |
| 4. Dearborn Co. 5/12 - 7/25; 2 sites | 14. Porter Co. 5/9 – 8/8; 2 sites       |
| 5. Dubois Co. 5/9 – 8/16; 2 sites    | 15. Ripley Co. 5/12 – 7/25; 2 sites     |
| 6. Floyd Co. 5/5 - 9/16; 2 sites     | 16. Tippecanoe Co. 5/27 – 8/15; 3 sites |
| 7. Hamilton Co. 5/9 – 8/2; 5 sites   | 17. Vanderburgh 5/5 – 8/16; 2 sites     |
| 8. Harrison Co. 5/5 - 9/16; 1 site   | 18. Warrick Co. 5/5 – 8/16; 1 site      |
| 9. Hendricks Co. 5/27- 8/15; 1 site  | 19. Whitley Co. 5/6 – 8/25; 1 site      |
| 10. Kosciusko Co. 5/4 -7/22; 5 sites |   |

A.3.2 Continued. Boxwood blight survey locations and dates

- |  |  |
|--|--|
| 1. Allen Co. 6/17, 7/5, 8/22           | 16. LaPorte 6/13, 7/12                             |
| 2. Bartholomew Co. 4/25; 4/27; 4 sites | 17. Lawrence Co. 4/29, 6/3                         |
| 3. Boone Co. 6/14                      | 18. Madison Co. 7/20                               |
| 4. Cass Co. 6/2                        | 19. Marion Co. 3/23, 3/29, 4/7; 5 sites            |
| 5. Decatur Co. 3/21                    | 20. Marshall Co. 6/28                              |
| 6. Delaware Co. 5/6, 5/31, 6/8         | 21. Monroe Co. 6/3, 6/13, 6/15                     |
| 7. Dubois Co. 5/9, 5/23; 3 sites       | 22. Montgomery Co. 7/12                            |
| 8. Elkhart Co. 5/27, 7/11              | 23. Perry Co. 5/13                                 |
| 9. Floyd Co. 5/4; 4 sites              | 24. Porter Co. 6/13, 7/27                          |
| 10. Greene Co. 4/28                    | 25. Shelby Co. 3/10; 2 sites                       |
| 11. Hamilton Co. 6/1, 6/8, 7/19        | 26. St. Joseph Co. 6/19, 6/9, 7/21, 7/26           |
| 12. Hendricks Co. 6/24                 | 27. Vanderburgh Co. 5/5, 5/19, 5/25, 5/27; 5 sites |
| 13. Huntington Co. 6/16                | 28. Warrick Co. 5/5                                |
| 14. Johnson Co. 4/5, 4/8; 3 sites      | 29. Wayne Co. 5/25, 5/21; 3 sites                  |
| 15. Kosciusko Co. 4/25, 6/16           |  |

A.3.2. Continued. Sudden oak death survey locations and dates.

- |                          |                                      |
|--------------------------|--------------------------------------|
| 1. Allen Co. 6/10        | 10. Madison Co. 7/20                 |
| 2. Delaware Co. 5/6      | 11. Marion Co. 7/13, 7/21, 7/22, 8/9 |
| 3. Dubois Co. 6/9        | 12. Porter Co. 6/29                  |
| 4. Floyd Co. 6/16        | 13. St. Joseph Co. 6/30, 7/6         |
| 5. Hamilton Co. 6/8, 7/1 | 14. Tippecanoe Co. 5/6               |
| 6. Hendricks Co. 5/31    | 15. Vanderburgh Co. 7/13; 2 sites    |
| 7. Jackson Co. 6/16      | 16. Vigo 6/7; 2 sites                |
| 8. Johnson Co. 7/13      | 17. Wells Co. 6/10                   |
| 9. LaPorte Co. 7/1       |                                      |

A.3.3. Benefits and Results of Survey:

No target species were recovered.

A.3.4. Database submissions:

Old world bollworm, *Helicoverpa armigera*,

Date Range: 05-04-2016 thru 9-16-2016

Counties 16 Sites 47 Pos 0 Neg 279

Boxwood blight, *Calonectria pseudonaviculata*,

Date Range: 03-21-2016 thru 8-22-2016

Counties 39 Sites 72 Pos 0 Neg 205 cultivars (=106,025 stems)

Sudden oak death, *Phytophthora ramorum*

Date Range: 05-06-2016 thru 8-09-2016

Counties 17 Sites 24 Pos 0 Neg 397

\*\*\*\*\*

#### A.4. Exotic Woodborers/Bark Beetles Survey

Objective 1. Utilize cooperator and APHIS program funding, as outlined in the financial plan to collaborate exotic woodborer/bark beetle survey, process trap samples, and deliver results to the NAPIS database. The Cooperator will conduct a program that is expected to provide information about the presence or absence of potentially damaging exotic pests including: 1. Japanese pine sawyer beetle, *Monochamus alternatus*; 2. Black fir sawyer, *Monochamus urussovii*; 3. sixtoothed bark beetle, *Ips sexdentatus*; 4. European spruce bark beetle, *Ips typographus*; 5. Mediterranean pine engraver, *Orthotomicus erosus*; 6. sixtoothed spruce bark beetle, *Pityogenes chalcographus*; 7. Oak ambrosia beetle, *Playpus quercivorus*; 8. European hardwood ambrosia beetle, *Trypodendron domesticum*; 9. Oak splendor beetle, *Agriilus biguttatus*; and 10. Goldspotted oak borer, *Agriilus auroguttatus*.

This survey was abbreviated in 2016 due to the unexpected loss of PPQ funding for federal summer trap tenders. Therefore, amended proposed data below was subset of the 2016 proposed data. Partial funds were used to enhance and assist wood boring/exotic bark beetle taxonomic diagnostics and resources.

##### Accomplishments;

Proposed and actual funding was \$3,369.

Amended proposed data were 630 records. Actual data were 789 records.

Actual cost per record was \$4.27.

A.4.1. Survey Methodology: This survey is 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. Amended proposed data collection for the risk-based, exotic woodborers/bark beetles survey were visual+purple trap= 5 locations X 1 trap X 12 visits x 2 pests =120 records, Monochamol+Alpha-pine+ETOH lures = 8 sites X 10 visits X 2 pests = 160 records; IPS Trilure = 8 sites X 10 visits X 3 pests = 240 records; P. quercivorus lure = 4 sites X 10 visits X 1 pest=40 records; Lineatin lure = 2 sites X 10 visits X 1 pest=20 records; Chalcogran lure = 5 sites X 10 visits X 1 pest =50 records (Total =630 proposed records). Wet cup Lindgren funnel traps were deployed at 17 Indiana sites representing 3 counties plus 1 site (county) in extreme southern Michigan. Michigan data were forwarded to the Michigan SSC. Sites were identified by recognition of apparent risk of receiving target pests through commerce. One to 2 (varies by site) Lindgren funnel traps with wet cups containing dilute propylene glycol antifreeze were placed at each site. Traps contained one of the following lures: Monochamol+alpha-pineneUHR+ethanol, Chalcogran, Lineatin, P. quercivorus, or IPS (tri-lure). Trap dates ranged from 8 April to 25 September. A single purple prism trap was deployed at 5 locations (counties). Traps were positioned on oak in mixed hardwood woodlands from 10 May to 13 August.

A.4.2. WB/EBB survey locations and dates.

Trap period extended from 8 April to 25 September.

1. LaPorte Co. 4/12 – 9/25; 3 sites, 5 Lindgren traps
2. Porter Co. 4/8 – 2/24; 12 sites, 18 Lindgren traps
3. Starke Co. 4/13 – 9/25; 2 sites, 4 Lindgren traps
  
4. Knox Co. 5/11 – 8/9; 1 site, 1 purple prism
5. LaPorte Co. 5/10 – 8/11; 1 site, 1 purple prism
6. Randolph Co. 5/12 – 8/10; 1 site, 1 purple prism
7. Tippecanoe Co. 5/10 – 8/11; 1 site, 1 purple prism
8. Whitley Co. 5/12 – 8/10 ; 1 site, 1 purple prism

A.4.3. Benefits and results of survey:

No target species were recovered.

A.4.4. Database submissions:

Oak splendor beetle, *Agrilus biguttatus*

Date Range: 05-16-2016 thru 8-11-2016

Counties 5    Sites 5    Pos 0    Neg 65

Goldspotted oak borer, *Agrilus auroguttatus*.

Date Range: 05-16-2016 thru 8-11-2016

Counties 5    Sites 5    Pos 0    Neg 65

Sixtoothed bark beetle, *Ips sexdentatus*

Date Range: 04-21-2016 thru 9-25-2016

Counties 2    Sites 8    Pos 0    Neg 104

European spruce bark beetle, *Ips typographus*

Date Range: 04-21-2016 thru 9-25-2016

Counties 2    Sites 8    Pos 0    Neg 104

Japanese pine sawyer beetle, *Monochamus alternatus*

Date Range: 04-21-2016 thru 9-25-2016

Counties 2    Sites 8    Pos 0    Neg 104

Black fir sawyer, *Monochamus urussovii*

Date Range: 04-21-2016 thru 9-25-2016

Counties 3    Sites 8    Pos 0    Neg 104

Mediterranean pine engraver, *Orthotomicus erosus*

Date Range: 04-21-2016 thru 9-25-2016

Counties 3    Sites 8    Pos 0    Neg 104

Sixtoothed spruce bark beetle, *Pityogenes chalcographus*

Date Range: 04-21-2016 thru 9-24-2016

Counties 1 Sites 5 Pos 0 Neg 65

Oak ambrosia beetle, *Playpus quercivorus*

Date Range: 04-21-2016 thru 8-25-2016

Counties 3 Sites 4 Pos 0 Neg 48

European hardwood ambrosia beetle *Trypodendron domesticum*

Date Range: 01-01-2016 thru 07-16-2016

Counties 2 Sites 2 Pos 0 Neg 26

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

All objectives for reporting period (1 January to 31 December 2016) 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**

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

Approved and signed by

\_\_\_\_\_  
Megan L. Abraham (Cooperator)

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

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

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