

Indiana Cooperative Agricultural Pest Survey

2017 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)

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CAPS 2017 Annual Report - Survey

Year:	2017
State:	INDIANA
Cooperative Agreement Name:	Indiana Agricultural Pest Surveys (CAPS) 2017
Cooperative Agreement Number:	17-8218-0332-CA
Project Funding Period:	1 January 2017 – 31 December 2017
Project Report:	Indiana CAPS Survey
Project Document Date:	30 March 2017
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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 work plan. When the output can be quantified, a computation of cost per unit is required when useful.*

Indiana Cooperative Agricultural Pest Surveys in 2017 are Soybean Commodity, Corn Commodity, bundled Nursery and Retail Plants, and taxonomic-grouped Exotic Wood Borer/Bark Beetles. 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 are 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. 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. 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 \$5,390.

Proposed data were 1,488 records. Actual data were 1,609 records.

Actual cost per record was \$3.35.

A.1.1 Survey Methodology: Survey methods for moths were adapted from the CAPS Soybean Commodity Guidelines (25 July 2007). Six 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 six 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 22-25 May and were serviced weekly through the end of the reporting period, 21 -25 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 of experience in soybean entomological field research by the SSC. Counties bordering the Ohio river and other southern Indiana counties with kudzu infestations were selected. A sample was 30 pendulum sweeps of a 15-inch heavy duty insect net along a walking transect (about 75 ft) in a soybean field. Three representative transects within a field were sampled on a single visit in late summer, 23-31 August.

A single random visual search in soybean for yellow witchweed, *Alectra vogelii*, were about 20 minutes in duration per site/3 visits.

Data are accessible through the NAPIS database.

A.1.2. Moth survey locations and dates;

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

1. Jennings Co. 5/24 – 8/24
2. Knox Co. 5/25 – 8/23
3. La Porte Co. 5/22 – 8/21
4. Randolph Co. 5/23 – 8/22
5. Tippecanoe Co. 5/22 – 8/21
6. Whitely Co. 5/23 – 8/25

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

- | | |
|-----------------------|----------------------|
| 1. Clark Co. 8/30 | 7. Knox Co. 8/24 |
| 2. Dubois Co. 8/29 | 8. Lawrence Co. 8/23 |
| 3. Floyd Co. 8/30 | 9. Perry Co. 8/30 |
| 4. Harrison Co. 8/30 | 10. Posey Co. 8/29 |
| 5. Jefferson Co. 8/23 | 11. Spencer Co. 8/30 |
| 6. Jennings Co. 8/23 | 12. Warrick Co. 8/30 |

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

1. La Porte Co. 6/19, 7/18, 8,14
2. Knox Co. 6/14, 7/21, 8/23
3. Randolph Co. 6/21, 7/12, 8/16
4. Tippecanoe Co. 6/19, 7/18, 8/16
5. Whitely Co. 6/20, 7/12, 8/16
6. Jennings Co. 6/21, 7/13, 8/24

A.1.3. Benefits and Results of Survey:

No target species were recovered.

A.1.4. Database submissions:

Old world bollworm, *Helicoverpa armigera*,
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Egyptian cottonworm, *Spodoptera littoralis*,
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Silver Y-moth *Autographa gamma*;
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Golden twin spot Moth, *Chrysodiexis chalcites*,
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 387

Bean plataspid, *Megacopta cibaria*,
Date Range: 08-23-2017 thru 8-30-2017
Counties 12 Sites 34 Pos 0 Neg 34

Yellow witchweed, *Alectra vogelii*,
Date Range: 06-14-2017 thru 8-24-2017
Counties 6 Sites 6 Pos 0 Neg 18

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, *Spodoptera litura*, brown stripe downy mildew, *Sclerophthora rayssiae* var. *zeae*, Philippine downy mildew, *Peronosclerospora philippinensis*, and downy mildew, *Peronosclerospora maydis*, Asiatic witchweed, *Striga asiatica* and tar spot, *Phyllachora maydis*.

Accomplishments:

Corn commodity survey:
Proposed and actual funding was \$5,390.
Proposed data were 1,858 records. Actual data were 2,711 records.
Actual cost per record was \$1.99.

A2.1. Survey Methodology: Survey methods for moths and diseases were adapted from the CAPS Corn Commodity Guidelines (23 July 2010). Six locations 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 sites at each of six locations (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 22-25 May and were serviced weekly through the end of the reporting period, 21-25 August.

Plant diseases (Java downy mildew, *Peronosclerospora maydis*, Philippine downy mildew, *Peronosclerospora philippinensis*, brown stripe downy mildew, *Sclerophthora rayssiae* var. *zuae*), and tar spot, *Phyllachora maydis* were assessed by evaluating leaf tissue from 65 counties in collaboration with the Purdue Plant Pest and Diagnostic Laboratory.

Survey for Asiatic witchweed, *Striga asiatic*, was conducted in six counties 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.

Data are accessible through the NAPIS database.

A.2.2. Moth survey locations and dates;

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

1. Jennings Co. 5/24 – 8/24
2. Knox Co. 25 – 8/23
3. La Porte Co. 5/22 – 8/21
4. Randolph Co. 5/23 – 8/22
5. Tippecanoe Co. 5/22 – 8/21
6. Whitely Co. 5/23 – 8/25

A.2.2. Continued: Exotic mildews and corn tar spot survey locations, sample dates, and (number of sites for a sample date)

01. Adams Co. 8/31
02. Bartholomew Co. 7/25
03. Benton Co. 7/26, 9/1 (3)
04. Boone Co. 8/31 (2), 9/1 (4), 9/12
05. Carroll Co. 6/14, 8/2, 8/4, 8/16 (3)
06. Clay Co. 7/28, 8/3 (3), 8/4
07. Clinton Co. 7/24, 7/26
08. Daviess Co. 7/27, 7/28, 8/3 (2)
09. DeKalb Co. 8/18, 10/6 (3)
10. Decatur Co. 7/27, 8/1, 8/3, 8/10
11. Dubois Co. 6/13, 7/21, 7/24
12. Elkhart Co. 8/21 (5)

13. Fayette Co. 6/27
14. Fountain Co. 7/25, 7/26, 7/27
15. Fulton Co. 6/12, 9/21
16. Gibson Co. 8/2
17. Grant Co. 8/15
18. Hamilton Co. 6/16, 8/31, 10/6
19. Harrison Co. 8/3
20. Hendricks Co. 5/22
21. Henry Co. 8/10
22. Huntington Co. 8/8
23. Jackson Co. 7/27, 8/2 (3), 8/15, 8/23
24. Jasper Co. 6/2, 7/27 (3), 9/7, 8/29 (2), 9/1 (2)
25. Jay Co. 7/11
26. Jennings Co. 7/28, 8/10
27. Johnson Co. 6/23, 7/27, 8/15
28. Kosciusko Co. 8/1 (2), 9/15, 8/7 (2), 8/21 (4) 10/6 (2)
29. LaGrange Co. 8/21 (2), 8/24, 9/8 (6)
30. Lake Co. 8/10
31. La Porte Co. 9/28 (10)
32. Madison Co. 7/5 (2),
33. Marshall Co. 7/25, 10/6 (2)
34. Martin Co. 7/12, 7/27, 7/28
35. Miami Co. 8/1
36. Montgomery Co. 6/15, 6/27, 7/24, 7/26, 7/28 (2), 8/3, 8/14, 10/18, 9/6 (5)
37. Newton Co. 8/17, 10/6 (2)
38. Noble Co. 8/18, 8/21 (3), 10/6 (3)
39. Orange Co. 8/1, 8/4
40. Owen Co. 8/3
41. Parke Co. 6/21, 7/20, 7,21, 7/28
42. Perry Co. 7/25
43. Porter Co. 9/28 (4), 10/6 (2)
44. Posey Co. 8/10, 8/14
45. Pulaski Co. 6/12, 7/25, 8/1, 8/15, 8/29 (2), 10/6 (2)
46. Putnam Co. 7/18, 8/4, 8/9
47. Randolph Co. 5/19, 6/7, 8/15, 8/18
48. Shelby Co. 6/7, 7/25, 7/27
49. Spencer Co. 8/2, 8/3
50. St. Joseph Co. 8/9 (2), 8/21 (3), 8/29
51. Starke Co. 7/31, 9/7 (2), 9/28 (6)
52. Steuben Co. 9/11
53. Sullivan Co. 8/14
54. Tippecanoe Co. 6/2, 6/6, 7/24, 7/26 (2), 8/3, 8/4 (2), 8/18, 8/23, 8/31 (2), 9/25, 9/6 (9)
55. Tipton Co. 6/8 (2), 6/12 (2), 8/1, 8/2, 8/15, 8/21 (10)
56. Vanderburgh Co. 8/10
57. Vigo Co. 6/23, 8/4, 8/8, 8/11 (3)
58. Wabash Co. 8/15

59. Warren Co. 9/1 (12)
60. Warrick Co. 8/1
61. Washington Co. 7/26 (4), 7/27 (4), 7/31, 8/3, 9/1
62. Wayne Co. 6/23
63. Wells Co. 8/11, 8/16, 8/18 (2), 8/24, 8/31
64. White Co. 8/29 (6), 9/1 (3), 10/6 (2)
65. Whitley Co. 7/6, 8/8

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

1. Jennings Co. 6/21, 7/13, 8/24
2. Knox Co. 6/14, 7/21, 8/23
3. La Porte Co. 6/19, 7/18, 8,14
4. Randolph Co. 6/21, 7/12, 8/16
5. Tippecanoe Co. 6/19, 7/18, 8/16
6. Whitely Co. 6/20, 7/12, 8/16

A.2.3. Benefits and Results of Survey:

Tar spot was confirmed on commercial maize in 9 counties. Purdue University Extension is providing management information. No other target species were recovered.

A.2.4. Database submissions:

Old world bollworm, *Helicoverpa armigera*,
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Egyptian cottonworm, *Spodoptera littoralis*
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Cotton cutworm, *Spodoptera litura*
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Silver Y-moth *Autographa gamma*
Date Range: 05-30-2017 thru 8-25-2017
Counties 6 Sites 5 Pos 0 Neg 390

Philippine downy mildew, *Peronosclerospora philippinensis*
Date Range: 05-19-2017 thru 10-18-2017
Counties 65 Sites 281 Pos 0 Neg 281

Java downy mildew, *Peronosclerospora maydis*
Date Range: 05-19-2017 thru 10-18-2017
Counties 65 Sites 281 Pos 0 Neg 281

Brown stripe downy mildew, *Sclerophthora rayssiae*
Date Range: 05-19-2017 thru 10-18-2017
Counties 65 Sites 281 Pos 0 Neg 281

Tar spot, *Phyllachora maydis*,
Date Range: 05-19-2017 thru 10-18-2017
Counties 65 Sites 290 Pos 9 Neg 281

Asiatic witchweed, *Striga asiatica*
Date Range: 06-14-2017 thru 8-24-2017
Counties 6 Sites 6 Pos 0 Neg 18

A.3. Nursery and Retail Plants Bundled Survey

Objective 1. Utilize cooperator and APHIS program funding, as outlined in the financial plan to conduct a nursery and retail plant survey, process moth trap samples, and deliver results of 3 collaborative surveys 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 \$18,419.
- Proposed data were 820 records. Actual data were 901 records.
- (208 records for *C. pseudonaviculata* are represented by 389,000 stems)
- Actual cost per record was \$20.44.

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 Purdue University Department of Entomology. For the moth survey, traps were deployed and serviced at 46 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 twice per month for 3 months. The 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 19 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 samples 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. Boone Co. 6/6 – 9/12; 2 sites | 10. Marion Co. 6/1 – 8/29; 2 sites |
| 2. Clark Co. 6/1 – 5/15; 2 sites | 11. Marshall Co. 5/25 – 8/4; 5 sites |
| 3. Dearborn Co. 5/7 – 8/28; 3 sites | 12. Monroe Co. 6/2 – 8/11; 2 sites |
| 4. Dubois Co. 6/9 – 8/28; 2 sites | 13. Morgan Co. 6/2 – 8/11; 3 sites |
| 5. Floyd Co. 6/1 – 8/15; 1 site | 14. Porter Co. 5/22 – 8/4; 2 sites |
| 6. Hamilton Co. 6/6 – 8/31; 5 sites | 15. Ripley Co. 5/17 – 8/14; 2 sites |
| 7. Harrison Co. 6/1 – 8/15; 2 sites | 16. Vanderburgh 6/6 – 8/22; 2 sites |
| 8. Hendricks Co. 6/2- 8/11; 2 site | 17. Warrick Co. 6/6 – 8/22; 1 site |
| 9. La Porte Co. 5/22 – 8/4; 3 sites | 18. Whitley Co. 6/16 – 9/22; 5 sites |

A.3.2 Continued. Boxwood blight survey locations and dates

- | | |
|---------------------------------------|--|
| 1. Allen Co. 7/6; 1 site | 14. La Porte 6/13, 5/30; 1 site |
| 2. Dearborn Co. 5/19 5/31; 3 sites | 15. Madison Co. 6/22, 7/18, 2 sites |
| 3. Decatur Co. 4/7; 1 site | 16. Marion Co. 4/5 to 5/31, 7 sites |
| 4. DeKalb Co. 7/6; 1 site | 17. Marshall Co. 8/10; 1 site |
| 5. Delaware Co. 7/25; 1 site | 18. Monroe Co. 5/24 to 6/30 4 sites |
| 6. Dubois Co. 5/17; 1 site | 19. Perry Co. 5/15; 1 site |
| 7. Elkhart Co. 6/8, 7/25; 2 sites | 20. Porter Co. 6/5; 1 site |
| 8. Franklin Co. 5/19; 1 site | 21. Shelby Co. 4/7; 3 sites |
| 9. Hamilton Co. 5/22 to 7/12; 4 sites | 22. St. Joseph Co. 6/13 to 6/27; 4 sites |
| 10. Hancock Co. 3/27; 2 sites | 23. Vanderburgh Co. 5/8 to 6/7; 6 sites |
| 11. Howard Co. 5/16; 1 site | 24. Vigo Co. 4/25 to 5/1; 6 sites |
| 12. Johnson Co. 4/18; 3 sites | 25. Warrick Co. 5/23, 6/27; 2 sites |
| 13. Lagrange Co. 5/15; 1 site | 28. Wayne Co. 9/6; 1 site |

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

- | | |
|---------------------------------------|--|
| 1. Boone Co. 5/10; 1 site | 11. Marion Co. 6/26, 7/10, 8/29; 5 sites |
| 2. Clark Co. 6/21, 8/21; 2 sites | 12. Monroe Co. 6/1; 2 sites |
| 3. Elkhart Co. 6/12; 1 site | 13. Morgan Co. 4/11; 1 site |
| 4. Floyd Co. 6/21; 1 site | 14. Porter Co. 5/30; 1 site |
| 5. Hamilton Co. 5/30 to 8/31; 3 sites | 15. St. Joseph Co. 6/20; 1 site |
| 6. Hendricks Co. 5/10, 6/21; 4 sites | 16. Vanderburgh Co. 6/7; 1 site |
| 7. Knox Co. 7/3; 1 site | 17. Wabash Co. 6/21; 1 site |
| 8. Kosciusko Co. 7/24; 1 site | 18. Warrick Co. 2/27; 1 site |
| 9. La Porte Co. 7/5; 1 site | 19. Wells Co. 6/21; 1 site |
| 10. Madison Co. 6/22, 7/18; 2 sites | |

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: 05-04-2017 thru 9-16-2017
Counties 18 Sites 46 Pos 0 Neg 290

Boxwood blight, *Calonectria pseudonaviculata*,
Date Range: 03-21-2017 thru 8-22-2017
Counties 28 Sites 61 Pos 0 Neg 208 (=388,000 stems)

Sudden oak death, *Phytophthora ramorum*
Date Range: 05-06-2017 thru 8-09-2017
Counties 19 Sites 29 Pos 0 Neg 403

A.4. Exotic Woodborers/Bark Beetles Taxonomic Based 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, *Playpys quercivorus*; 8. European hardwood ambrosia beetle, *Trypodendron domesticum*; 9. Oak splendor beetle, *Agrilus biguttatus*; 10. Goldspotted oak borer, *Agrilus auroguttatus*; and 11. Asian longhorned beetle, *Anoplophora glabripennis*. 12. Large pine weevil, *Hyllobius abietis*, was added after the work plan was submitted.

Accomplishments;

Proposed and actual funding was \$1,813

Proposed data were 2,756 records. Actual data were 2,339 records.

Actual cost per record was \$0.78.

The fewer actual records than number of proposed records was due to my error on the survey summary, a miscalculation of the number of expected records for Oak ambrosia beetle, *Playpus quercivorus*; and European hardwood ambrosia beetle, *Trypodendron domesticum*, and fewer number of trap sites than anticipated (53 vs 60).

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. Wet cup, 12-funnel, Lindgren traps were deployed at 53 Indiana sites representing 26 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 set dates ranged from 18 April to 10 November. A single purple prism trap was deployed at 6 locations (counties). Traps were positioned on oak in mixed hardwood woodlands from 10 May to 13 August. Visual observations for exit holes and frass from Asian longhorned beetle, *Anoplophora glabripennis*, consisted of a 30-minute random search in a mixed hardwood forest once monthly for June, July, and August at 6 statewide counties. Data are accessible through the NAPIS database.

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

Trap period extended from 18 April to 11 November.

Lindgren funnel trap

- | | |
|---|---|
| 1. Clark Co. 4/18 – 10/6; (3 sites) | 14. La Porte Co. 4/23 – 10/8; (3 sites) |
| 2. Daviess Co. 4/22 – 10/5 (1 site) | 15. Madison Co. 5/29 – 10/25; (1 site) |
| 3. Decatur Co. 5/4 – 10/12; (2 sites) | 16. Marion Co. 5/28 – 11/9; (6 sites) |
| 4. Delaware Co. 5/30 – 10/25; (1 site) | 17. Martin Co. 4/21 – 10/13; (2 sites) |
| 5. Dubois Co. 4/22 -10/5; 1 site) | 18. Montgomery Co. 6/19 – 11/10; (1 site) |
| 6. Elkhart Co. 4/23 – 10/8; (2 sites) | 19. Orange Co. 5/11 – 10/16; (1 site) |
| 7. Franklin Co. 5/4 – 10/12 (1 site) | 20. Parke Co. 6/19 – 11/10; (1 site) |
| 8. Gibson Co. 4/24 – 10/12; (2 sites) | 21. Pike Co. 4/21 – 10-11; (1 site) |
| 9. Greene Co. 4/21 – 10/13; (1 site) | 22. Porter Co. 4/19 – 10/4; (12 sites) |
| 10. Hamilton Co. 5/30 – 10/25; (1 site) | 23. Shelby Co. 5/30 – 10/26; (2 sites) |
| 11. Harrison Co. 4/27 – 10/16; (1 site) | 24. Starke Co. 4/21 – 10/7; (2 sites) |
| 12. Hendricks Co. 5/29–10/27; (2 sites) | 25. Vanderburgh Co 4/24-10/12; (1 site) |
| 13. Jefferson Co. 4/25 – 10/6 (1 site) | 26. Washington Co. 9/25-10/10; (1 site) |

<u>Purple prism trap weekly</u>	<u>Visual search monthly</u>	
1. Jennings Co. 5/24 - 8/24	6/21, 7/27, 8/24	(1 site)
2. Knox Co. 5/25 - 8/23	6/14, 7/28, 8/23	(1 site)
3. La Porte Co. 5/22 - 8/14	6/19, 7/24, 8,21	(1 site)
4. Randolph Co. 5/23 - 8/16	6/21, 7/26, 8/16	(1 site)
5. Tippecanoe Co. 5/22 - 8/16	6/19, 7/24, 8/21	(1 site)
6. Whitley Co. 5/23 - 8/16	6/20, 7/26, 8/16	(1 site)

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: 05-30-2017 thru 8-25-2017

Counties 6 Sites 6 Pos 0 Neg 78

Goldspotted oak borer, *Agrilus auroguttatus*.

Date Range: 05-30-2017 thru 8-25-2017

Counties 6 Sites 6 Pos 0 Neg 78

Sixtoothed bark beetle, *Ips sexdentatus*

Date Range: 04-21-2017 thru 11-9-2017

Counties 19 Sites 31 Pos 0 Neg 307

European spruce bark beetle, *Ips typographus*

Date Range: 04-21-2017 thru 11-9-2017

Counties 19 Sites 31 Pos 0 Neg 307

Japanese pine sawyer beetle, *Monochamus alternatus*

Date Range: 04-21-2017 thru 11-9-2017

Counties 19 Sites 31 Pos 0 Neg 307

Black fir sawyer, *Monochamus urussovii*

Date Range: 04-21-2017 thru 11-9-2017

Counties 19 Sites 31 Pos 0 Neg 307

Mediterranean pine engraver, *Orthotomicus erosus*

Date Range: 04-21-2017 thru 11-9-2017

Counties 19 Sites 31 Pos 0 Neg 307

Sixtoothed spruce bark beetle, *Pityogenes chalcographus*

Date Range: 04-19-2017 thru 10-4-2017

Counties 1 Sites 5 Pos 0 Neg 60

Oak ambrosia beetle, *Playpus quercivorus*
Date Range: 04-18-2017 thru 11-9-2017
Counties 15 Sites 17 Pos 0 Neg 181

European hardwood ambrosia beetle, *Trypodendron domesticum*
Date Range: 04-18-2017 thru 08-14-2017
Counties 15 Sites 17 Pos 0 Neg 82

Asian longhorned beetle, *Anoplophora glabripennis*
Date Range: 06-14-2017 thru 8-24-2017
Counties 6 Sites 6 Pos 0 Neg 18

Large pine weevil, *Hyllobius abietis*, was added after the work plan was submitted.
Date Range: 04-21-2017 thru 9-25-2017
Counties 19 Sites 31 Pos 0 Neg 307

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

All objectives for reporting period (1 January to 31 December 2017) 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: _____