

**Title:**

2017 New York Sweet Corn Pheromone Trap Network (SCPTN)

**Project leader(s):**

Marion Zuefle New York State Integrated Pest Management Program

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**Cooperator(s):**

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**Abstract:**

For 23 years, the Sweet Corn Pheromone Trap Network has been monitoring the flight of three important insect pests of sweet corn, European corn borer, corn earworm, fall armyworm, and more recently, 2010, Western bean cutworm. These insects cause damage to sweet corn ears in their larval stage. These pests are moths in their adult stage and can be monitored using traps baited with pheromone lures specific for each species. Traps are placed near sweet corn fields to monitor moth flights. The weekly trap catch information allows growers, consultants, Cooperative Extension and vegetable processor field staff to track the flights and make informed decisions about when sweet corn fields need to be scouted or treated with an insecticide. This project was funded in part by in-kind contributions from growers and consultants who host and check traps.

**Background and justification:**

Sweet corn for the fresh and processing markets is an important crop throughout NY. In 2016 sweet corn was planted on 28,900 acres in New York with a value of 53 million dollars ([USDA 2016 Vegetable Summary](#)). Four major pests of sweet corn, European corn borer (ECB-E and ECB-Z), corn earworm (CEW), fall armyworm (FAW) and Western bean cutworm (WBC) can be monitored in their adult stage using pheromone traps. Pest management is an especially important aspect of fresh market sweet corn production because the unhusked ear is marketed, and buyers are frequently very sensitive to insect damage or the presence of larvae in the ear. Harvest quality requirements are different for processing corn, which usually receives fewer insecticide applications than fresh market corn. Integrated pest management practices are widely used on both crops to determine the need for insecticide applications. Pheromone trap catches provide valuable information to growers, consultants, and processor field staff making pest management decisions. Pheromone trap catches help growers and consultants decide when to start scouting fields for egg masses and larvae, reinforce what scouts are finding, help growers choose the best spray materials for the pest complex that's present, and alert the industry to the arrival of

the migratory pests, CEW and FAW.

Pheromone Trap catches from 21 sites in western NY were an integral part of the weekly pest update newsletter, *VegEdge*, sent by the Cornell Vegetable Program to subscribers in 13 counties. In eastern NY, 15 sites were monitored weekly with trap catch results made available, through *Veg Update*, to subscribers of the 17 county Eastern NY Commercial Horticulture Program (ENYCHP). The Trap catches were also posted weekly to the [sweet corn pheromone trap network blog](#), linked through the [NYS IPM Program website](#), the [Network for Environment and Weather Applications website](#), and posted to a regional website ([PestWatch](#)) that includes trap catches from several northeastern states, making the information available to a large number of growers and extension personnel.

### **Objectives:**

1. Establish and maintain a network of pheromone traps for sweet corn pests in NY.
2. Provide regional trapping information and recommendations to extension field staff and consultants working with sweet corn growers.
3. Provide regional trapping information to growers, along with scouting and threshold recommendations.

### **Procedures:**

1. Sets of one each of ECB-E, ECB-Z, CEW, FAW, and WBC traps were placed at each of 36 trapping locations, 21 sites in western NY and 15 sites in eastern NY (Figure 1). Scentry Heliothis net traps were used to trap ECB and CEW. The BCS/Agrisense Unitrap was used for FAW and WBC. Lures from Trece Inc. were used for both races of ECB. Lures from Scentry Inc. were used for CEW, FAW and WBC. All lures were replaced every two weeks.  
ECB, CEW, and FAW traps were set up in late-May at fresh market locations, and as processing fields approached tassel emergence in other locations. WBC traps were set up in early to mid-June.  
Traps were placed at least 40 meters apart in grassy areas near sweet corn fields, avoiding areas near hedgerows where air circulation is poor. Heliothis traps were mounted on posts such that the bottom of the trap is ~6" above the grassy canopy. Unitraps were hung from short stakes to which angle brackets had been attached and were placed either in the field or at the edge of the field. Whenever possible, traps were moved to new fields as the previous fields matured (silks became dry) and became less attractive to moths.
2. Cooperators checked traps weekly on Monday or Tuesday and sent trap catch numbers to Marion Zuefle via phone or email. Weekly catches for each location were collated and posted, along with interpretation and scouting and thresholds recommendations for fresh market sweet corn, on the [sweetcorn.nysipm.cornell.edu](http://sweetcorn.nysipm.cornell.edu) blog.
3. Information posted on the blog was used directly by subscribing growers, incorporated into crop and pest updates distributed weekly by regional extension programs, or provided to growers via direct contact with collaborating consultants. All catches were also posted on the [PestWatch](#) website.

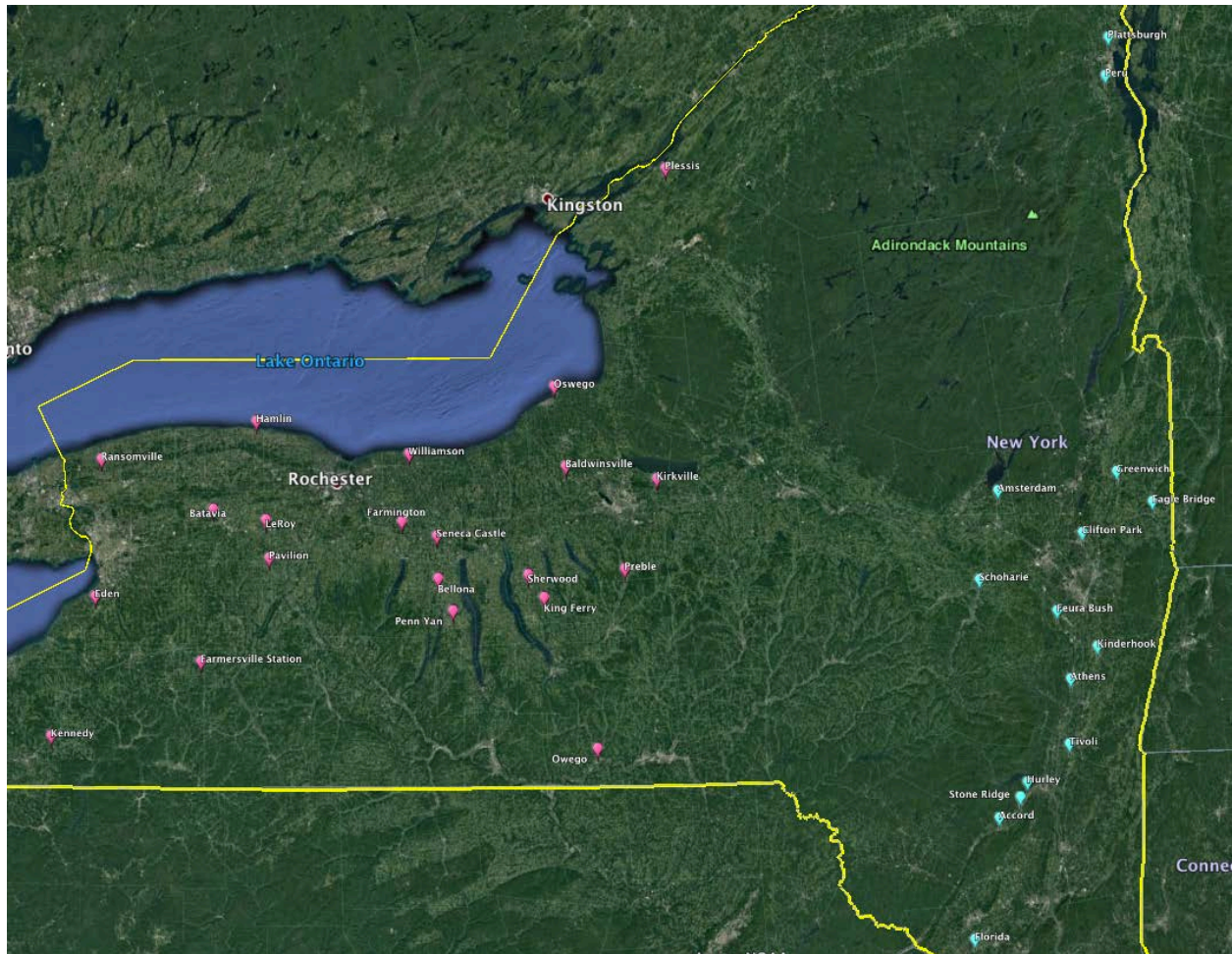


Figure 1. Map showing the 21 trap locations in western NY (pink) and the 15 trap locations in eastern NY (blue).

### Results and discussion:

The overall trend for the flights of the five moth species is represented in Figure 2, which gives the average trap catch for all 36 sites. ECB-E, ECB-Z and CEW remained fairly low throughout the season. WBC peaked early August with an average trap catch of 41 moths. FAW peaked about 4 weeks later in early September with an average trap catch of 25 moths. There was great variation among the sites. This can be seen in the cumulative trap catch for each moth species at the 36 different sites (Table 1).

In western NY, ECB numbers remained low throughout most of the season (Figure 3) and was comparable to the 2016 season (Figure 4). For eastern NY, ECB-E numbers were greater this year (Figure 5) as compared to last year (Figure 6) with a clear peak in mid-August. ECB-Z was slightly greater in eastern NY in 2017 as compared to 2016. Both of these moths continue to decline overall when looking at the 24-year trend (Figure 7). This decline has been attributed in part to the increase use of Bt field corn.

Corn earworm trap catch numbers for both western NY in 2017 (Figure 3) and eastern NY (Figure 5) were lower than in 2016 (Figure 4 and 6). There was slight peak in trap catches in late June, followed by a larger and more sustained peak, August-September, in eastern NY. This was the lowest year for CEW since 1997 (Figure 8).

Fall armyworm peak two weeks earlier than last year in both eastern and western NY. Trap catch for western NY averaged 24 moths during the 1st week of September 2017 (Figure 3). This was lower than the average of 2016, which was 74 moths and occurred the 3<sup>rd</sup> week of September (Figure 4). In eastern NY FAW numbers were comparable between the two years (Figure 5 and 6). The 20-year trend shows that FAW has decreased over the last three years (Figure 8).

In 2010 we began monitoring the flight of Western bean cutworm in NY. In 2016 we saw a decrease in WBC numbers but in 2017 the numbers increased again. This was true for both western and eastern NY. In western NY, WBC peaked on August 8<sup>th</sup> with an average of 48 moths per trap. The peak occurred one week later than in western NY in 2016 which occurred on August 2<sup>nd</sup> at 35 moths per trap. In eastern NY the same pattern followed. The peak occurred on August 8<sup>th</sup> with 30 moths per trap in 2017 and one week early with 16 moths per trap in 2016. The 8-year trend shows that the population is still on the rise. There was a decrease in 2016, possibly due to the severe drought or overwintering success, but in 2017 the population increased again (Figure 8).

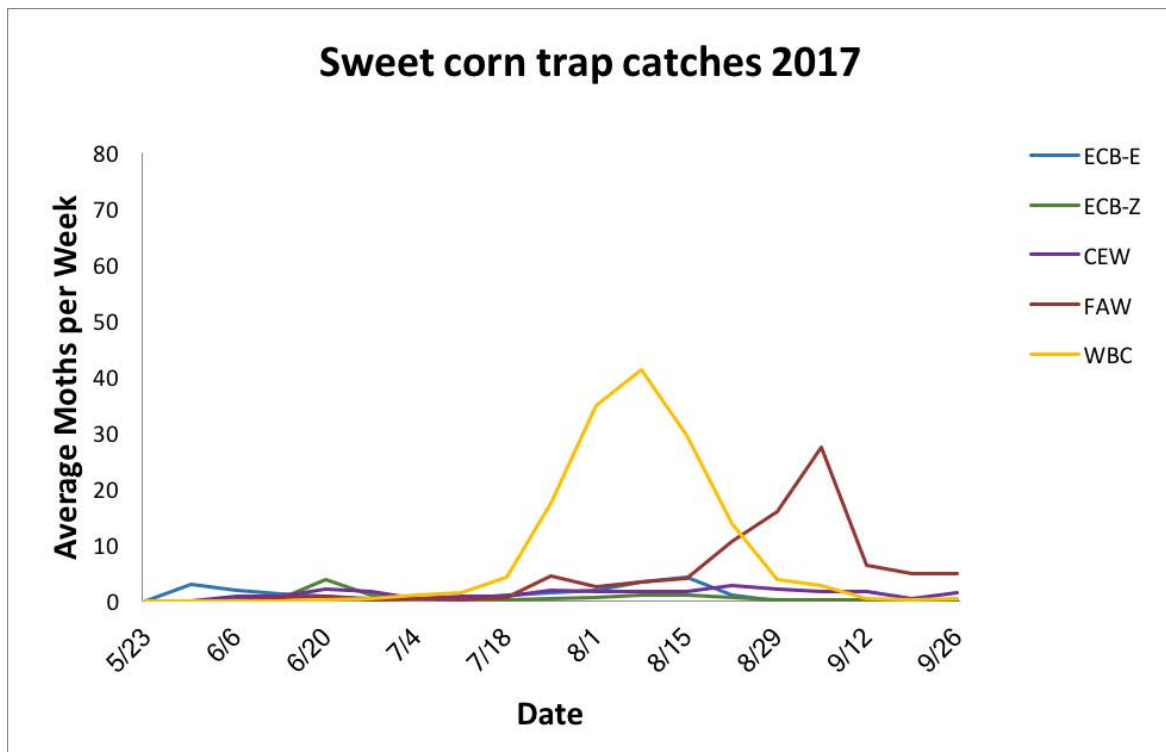


Figure 2. Average number of moths caught per week for all 36 sites in 2017  
 Table 1. Total moths caught at each of the 36 sites.



| <b>Site</b>   | <b>ECB-E</b> | <b>ECB-Z</b> | <b>CEW</b> | <b>FAW</b> | <b>WBC</b> |
|---------------|--------------|--------------|------------|------------|------------|
| Accord        | 5            | 2            | 5          | 0          | 89         |
| Amsterdam     | 26           | 0            | 1          | 11         | 1          |
| Athens        | 2            | 3            | 22         | 38         | 49         |
| Baldwinsville | 16           | 2            | 28         | 40         | 297        |
| Batavia       | 8            | 3            | 34         | 10         | 194        |
| Bellona       | 0            | 9            | 7          | 312        | 284        |
| Clifton Park  | 3            | 6            | 9          | 31         | 90         |
| Eagle Bridge  | 3            | 2            | 4          | 4          | 70         |
| Eden          | 4            | 3            | 46         | 7          | 448        |
| Farmersville  | 1            | 1            | 3          | 24         | 128        |
| Farmington    | 28           | 14           | 5          | 14         | 55         |
| Feura Bush    | 3            | 18           | 19         | 1          | 42         |
| Florida       | 11           | 20           | 49         | 307        | 72         |
| Greenwich     | 11           | 18           | 14         | 11         | 73         |
| Hamlin        | 31           | 9            | 18         | 48         | 128        |
| Hurley        | 221          | 29           | 72         | 0          | 0          |
| Kennedy       | 3            | 29           | 1          | 31         | 209        |
| Kinderhook    | 11           | 2            | 31         | 86         | 213        |
| King Ferry    | 0            | 0            | 12         | 270        | 132        |
| Kirkville     | 7            | 2            | 10         | 2          | 29         |
| LeRoy         | 14           | 8            | 12         | 39         | 116        |
| Oswego        | 3            | 0            | 4          | 3          | 402        |
| Owego         | 0            | 0            | 2          | 0          | 20         |
| Pavilion      | 2            | 4            | 19         | 152        | 37         |
| Penn Yan      | 4            | 37           | 30         | 229        | 48         |
| Peru          | 9            | 2            | 0          | 4          | 244        |
| Plattsburgh   | 6            | 0            | 1          | 8          | 208        |
| Plessis       | 2            | 0            | 10         | 6          | 515        |
| Preble        | 1            | 1            | 49         | 56         | 310        |
| Ransomville   | 9            | 10           | 18         | 9          | 51         |
| Schoharie     | 0            | 7            | 3          | 24         | 34         |

|               |    |   |    |    |    |
|---------------|----|---|----|----|----|
| Seneca Castle | 51 | 6 | 0  | 77 | 45 |
| Sherwood      | 0  | 0 | 8  | 15 | 18 |
| Stone Ridge   | 7  | 1 | 9  | 0  | 0  |
| Tivoli        | 8  | 6 | 12 | 0  | 0  |
| Williamson    | 2  | 1 | 7  | 0  | 8  |

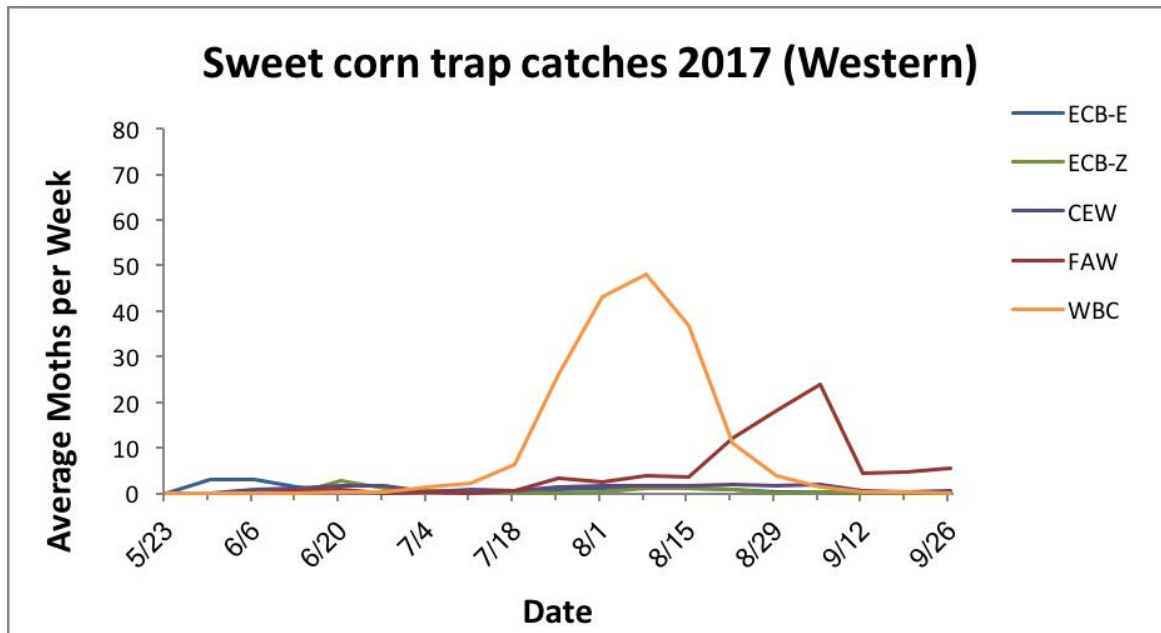


Figure 3. Average number of moths caught per week for 21 Western NY sites in 2017.

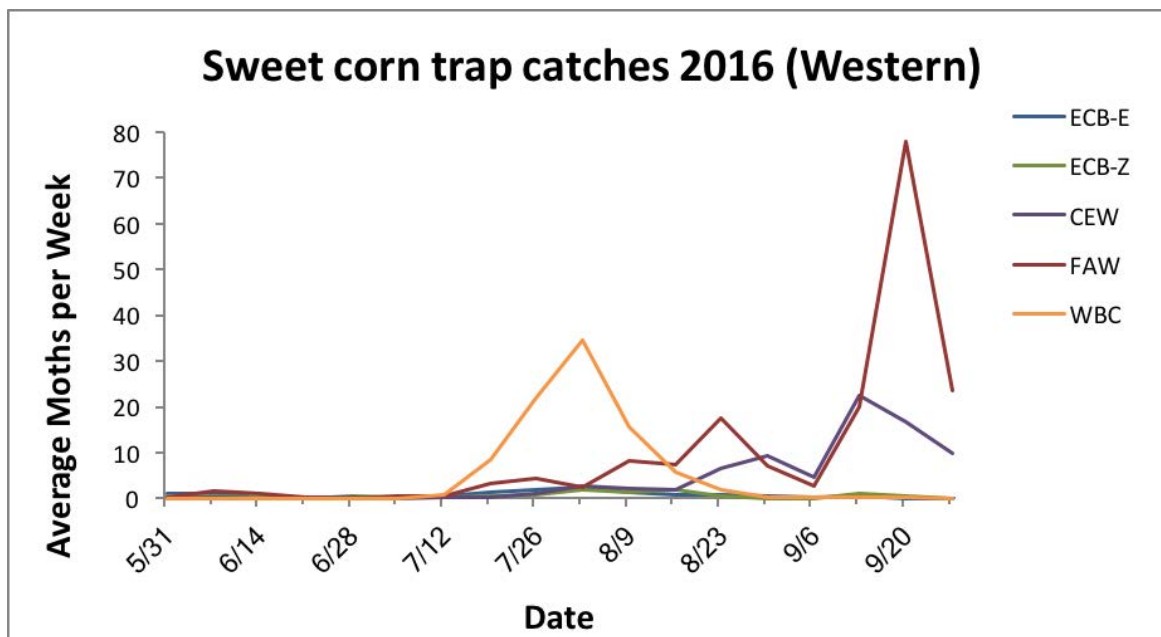


Figure 4. Average number of moths caught per week for 24 Western NY sites in 2016.

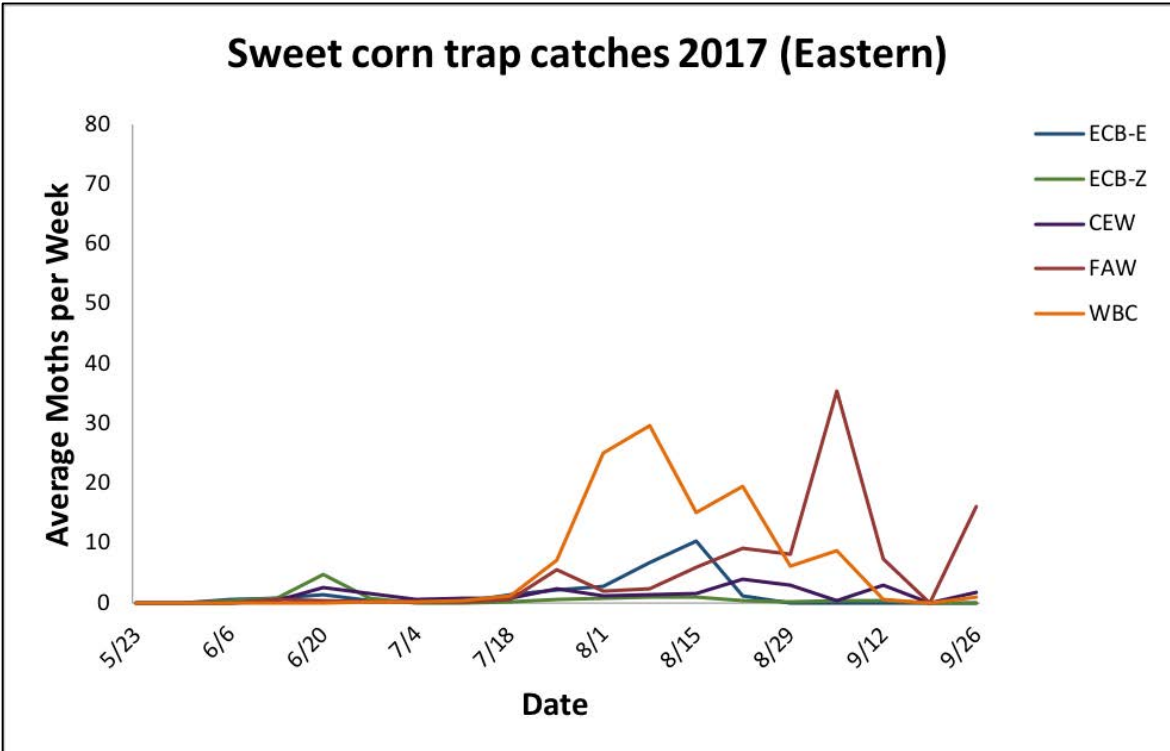


Figure 5. Average number of moths caught per week for 15 Eastern NY sites in 2017.

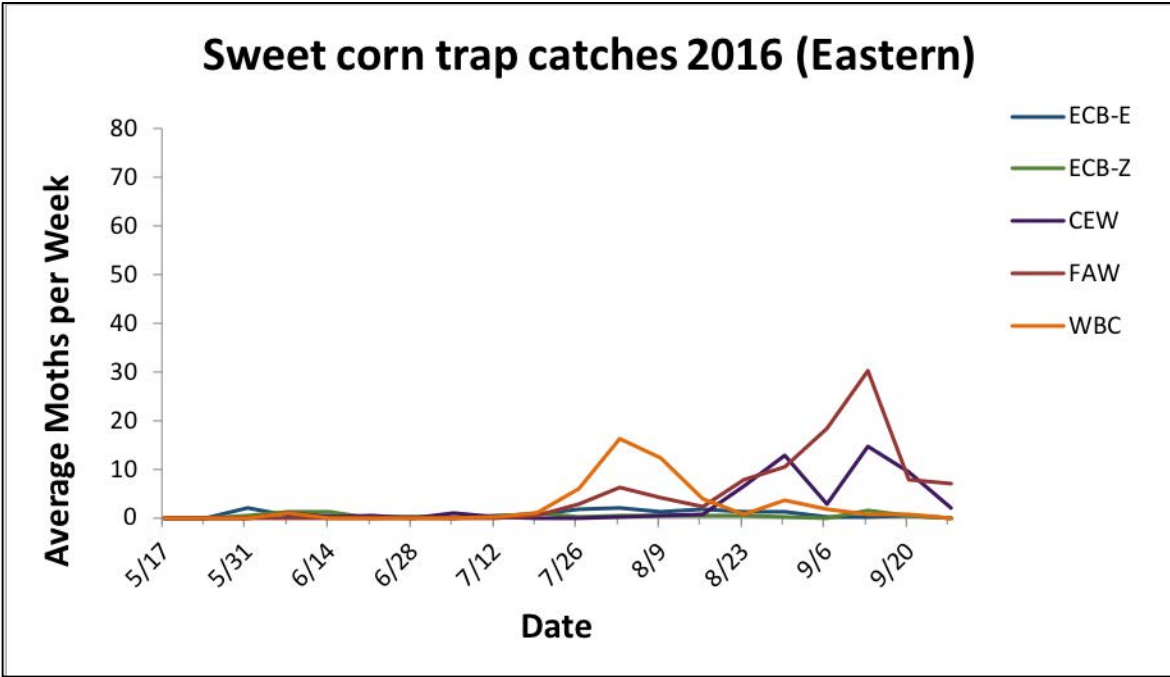


Figure 6. Average number of moths caught per week for 14 Eastern NY sites in 2016.

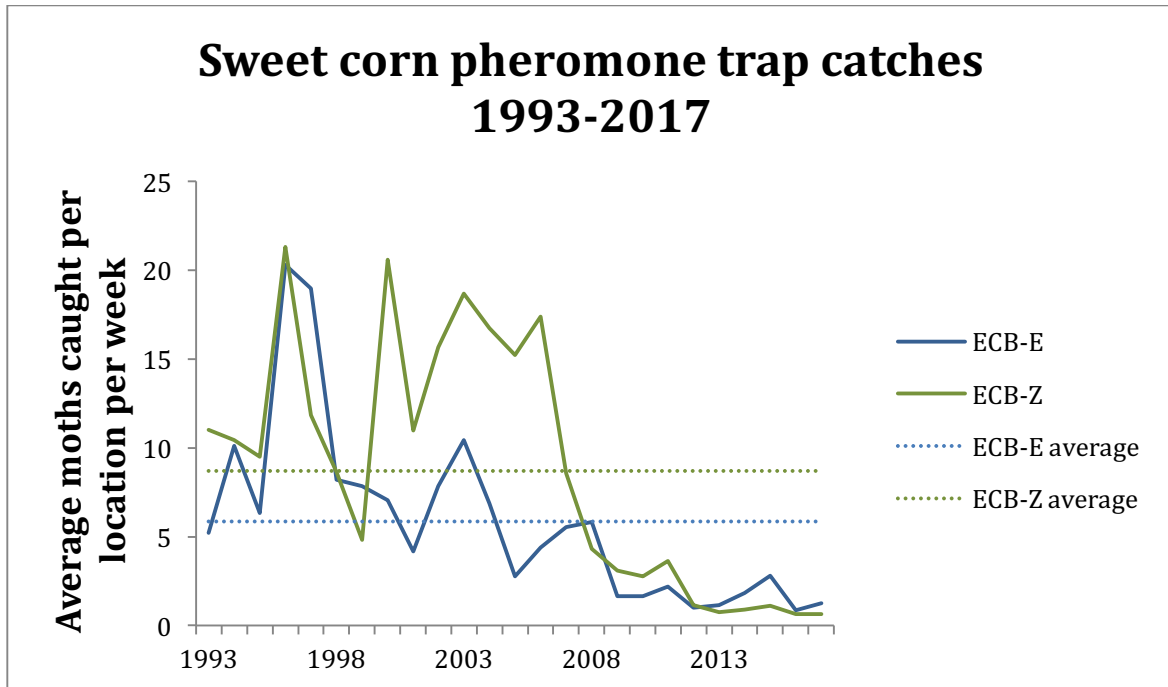


Figure 7. Average number of European corn borer, both E and Z race, moths caught per trapping location per year from 1993-2017.

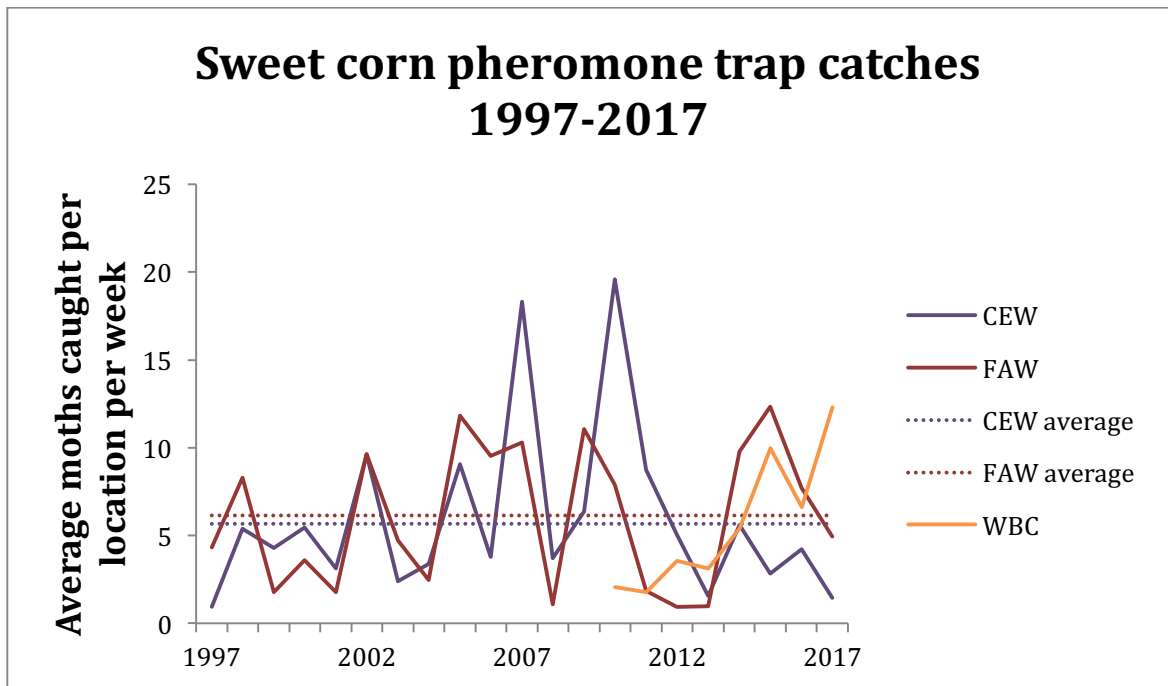


Figure 8. Average number of corn earworm (CEW), fall armyworm (FAW) and western bean cutworm (WBC) moths caught per trapping location per year from 1997-2017.

**Project location(s):**



Baldwinsville, Onondaga Co.; Batavia, Genesee Co.; Bellona, Yates Co.; Eden, Erie Co.; Farmersville Station, Cattaraugus Co.; Farmington, Ontario Co.; Hamlin, Monroe Co.; Kennedy, Chautauqua Co.; King Ferry, Cayuga Co.; Kirkville, Madison Co.; LeRoy, Genesee Co.; Ransomville, Niagara Co.; Oswego, Oswego Co.; Owego, Tioga Co.; Pavilion, Genesee Co.; Penn Yan, Yates Co.; Plessis, Jefferson Co.; Preble, Cortland Co.; Seneca Castle, Ontario Co.; Sherwood, Cayuga Co.; Williamson, Wayne Co.  
Accord, Ulster Co.; Amsterdam, Fulton Co.; Athens, Greene Co.; Clifton Park, Saratoga Co.; Eagle Bridge, Rensselaer Co.; Feura Bush, Albany Co.; Florida, Orange Co.; Greenwich, Washington Co.; Hurley, Ulster Co.; Kinderhook, Columbia Co.; Peru, Clinton Co.; Plattsburgh, Clinton Co.; Schoharie, Schoharie Co.; Stone Ridge, Ulster Co.; and Tivoli, Dutchess Co.

**Samples of resources developed:**

Weekly blog posts from 5/30/17 to 9/26/17; totaling 18 posts were posted to the Sweet Corn Pheromone Trap Network Report blog found at:

<http://sweetcorn.nysipm.cornell.edu/>.

There are 102 subscribers to the blog and within the last year this blog has received 2,488-page views by 802 unique visitors.

The weekly blog posts are also included in the *VegEdge* newsletter which has 435 enrollees. Trap counts for eastern NY are presented in the *Weekly Veg update* which has 550 enrollees.