

Title:

2010 New York Sweet Corn Pheromone Trap Network

Project Leader(s):

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Funding: USDA eIPM, Hatch funds to the Hoffmann lab, in-kind contributions from crop consultants and individual farmers

Abstract:

Three important insect pests of sweet corn, European corn borer, corn earworm, and fall armyworm, cause damage to ears in their "worm" or larval stage. These pests are moths in their adult stage. Traps baited with the pheromones that male and female moths use to find each other are set up near sweet corn production in NY. The trap catch information allows growers, consultants, and Cooperative Extension and vegetable processor field staff to track the flights of the adults of these three pests, and trap numbers contribute to making informed decisions about when sweet corn fields need to be scouted or treated with an insecticide. In 2010 traps for a new pest, the western bean cutworm, were added to the trap network to survey where in the state they are being found. This project is 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 2009, fresh market sweet corn was grown on approximately 23,000 acres in New York with a value of 58.3 million dollars. Acreage and value statistics on processing sweet corn are no longer collected; the most recent information is 18,400 acres with a value of 8.9 million dollars (2006 figures). Three major "worm" pests of sweet corn, European corn borer (ECB-E and ECB-Z), corn earworm (CEW), and fall armyworm (FAW) are moths in the adult stage; and can be monitored using pheromone traps. A new pest, the western bean cutworm (WBC), is moving into the area from its historic range in the west and has the potential to be an economically important pest of sweet corn, field corn, and dry beans. 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 ECB, reinforce what scouts are finding, help choose the best spray materials for the pest complex that's present, and alert the industry to the arrival of the two migratory pests, CEW and FAW.

Pheromone trap catches are an integral part of weekly pest update newsletters sent by the Cornell Vegetable Extension program to approximately 260 subscribers in nine counties. The trap catches are also posted on the NYS IPM Program web site, the Northeast Weather Association web site, and a regional web site 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 networks 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 trapping location (Fig. 1). Additional sites, set up near field corn or dry beans, were monitored with only WBC traps (Fig 2). 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, and lures were replaced every two weeks. Lures from Hercon Inc. were used for CEW, and replaced every two weeks. Lures from Scentry Inc. were used for FAW and WBC. All lures were replaced every two weeks. ECB and some CEW traps were set up in mid-May at fresh market locations, and as processing fields approached tassel emergence in other locations. WBC traps were set up in late June. Remaining CEW, and FAW traps were set up in early to mid-July. Traps were placed at least 40 meters apart in grassy areas near 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 and became less attractive to moths.
- 2) In Western NY at sites with the full complement of traps, cooperators checked traps weekly on Monday or Tuesday and sent catch numbers to Abby Seaman 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 Tuesday evening on the vegetable extension staff electronic listserv and the following day on the NYS IPM and PestWatch web sites. WBC-only sites were checked weekly and numbers reported to Keith Waldron, who combined them with the counts from the other sites and reported to field crop audiences.

- 3) Information posted on the listserv was incorporated into crop and pest updates distributed weekly by local extension programs to approximately 260 subscribers, or provided to growers via direct contact with consultants. On Long Island, trap catches are provided directly to farmers via weekly pest updates, All catches are also posted on the PestWatch web site (www.pestwatch.psu.edu/).



Figure 1. 2010 trapping locations. Open circles indicate locations with WBC traps only

Results and discussion:

European corn borer trap catches in western NY are continuing on a low/decreasing trend that started in 2008 (Fig 2). Reports from the Midwest indicate that ECB numbers have decreased with increasing acreage of Bt transformed field corn varieties. Adoption of Bt transformed varieties is lower in New York, but increasing, and we may be starting on the same trend.

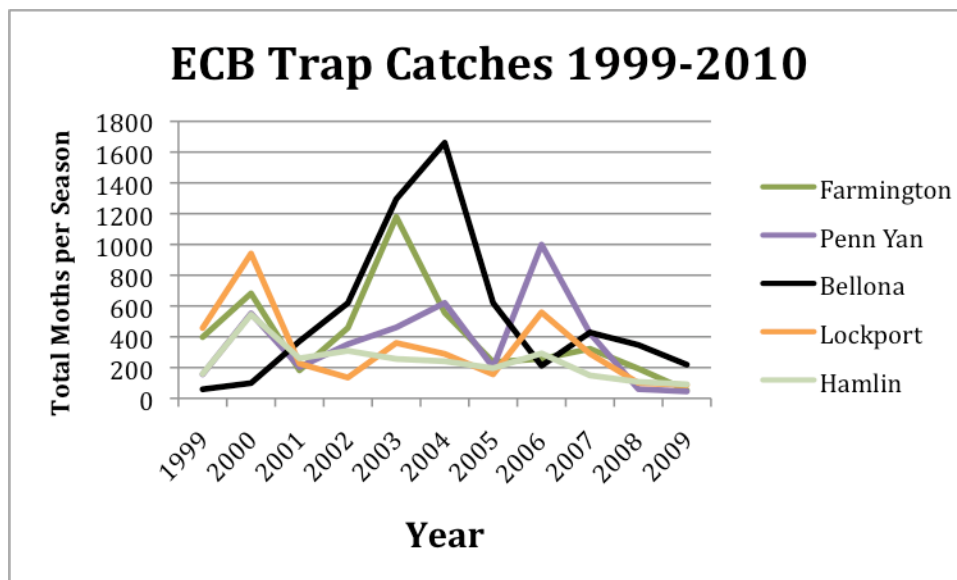


Figure 2. ECB trap catches for selected locations 1999-2010

Corn earworm catches in 2010 started relatively early at a couple of WNY locations, and reached very high numbers by mid-August at most locations, particularly Long Island, which typically experiences earlier and higher CEW numbers than upstate. CEW numbers in this range greatly increase insecticide applications and can cause unacceptable harvest quality despite tight spray schedules. Fall armyworm flights started at about the same time as corn earworm and also reached high levels at some sites, but high catches were more localized for fall armyworm. Excel files with trap catch numbers and graphs for each site are available on request.

Western bean cutworm

In 2010, 54 western bean cutworm pheromone traps were deployed in 29 counties across NY. Monitoring was initiated the second week of June. A total of 739 WC moths were collected in NY pheromone traps this past season (Table 1). Peak catches occurred during the weeks of July 26 and August 1 (Fig. 3). WBC eggs were found in one sweet corn field in Erie county, and larvae were found in field corn in Niagara county. WBC is on track to become an economically important pest in sweet corn, field corn, and dry beans in NY over the next couple of years.

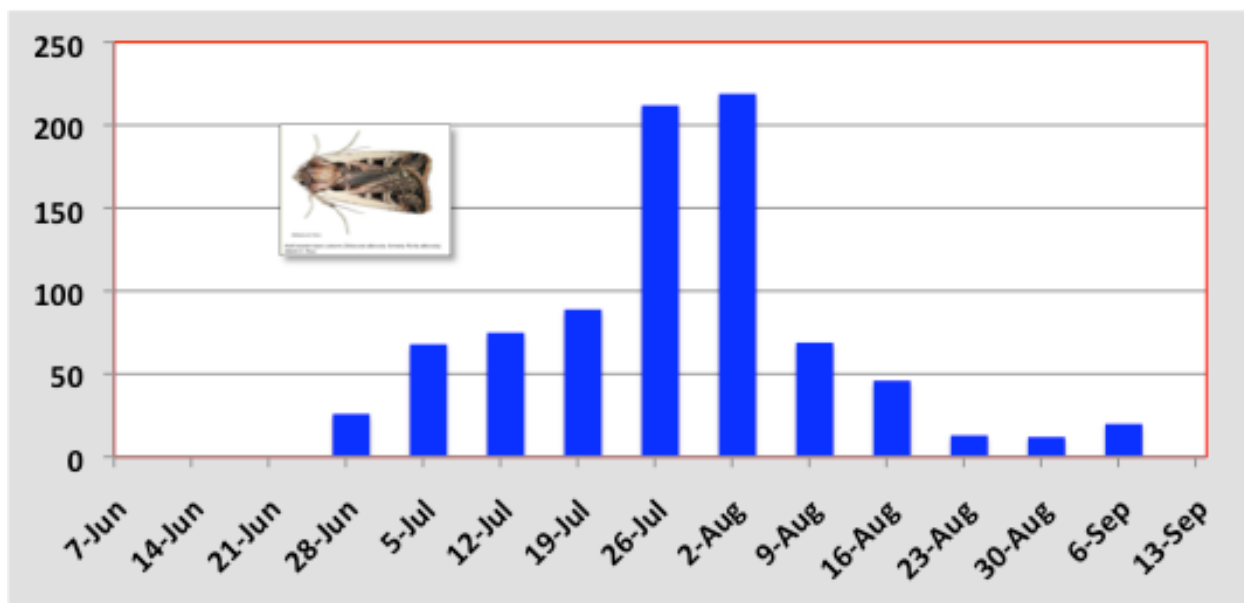


Figure 3. Total western bean cutworm pheromone trap catches by week

Table 1. 2010 NY WBC Pheromone Trap Catches by county (June – September 2010)

County (# traps)	Total Catch	County (# traps)	Total Catch	County (# traps)	Total Catch
Cattaraugus (1)	18	Livingston (2)	95	Steuben (6)	92
Chautauqua (1)	4	Madison (1)	6	Suffolk (1)	3
Chemung (2)	9	Monroe (2)	32	Oneida (1)	3
Columbia (1)	1	Montgomery (1)	3	Tioga (5)	22
Cortland (4)	47	Niagara (1)	10	Tompkins (5)	65
Erie (1)	99	Oneida (1)	3	Yates (2)	64
Genesee (3)	56	Onondaga (1)	7	Washington (1)	5
Jefferson (1)	9	Schoharie (1)	3	Wyoming (1)	18
Lewis (1)	7	Seneca (1)	5		

Project location(s):

Traps were located in Cayuga, Cattaraugus, Chautauqua, Chemung, Columbia, Erie, Genesee, Madison, Monroe, Montgomery, Niagara, Onondaga, Ontario, Orleans, Schoharie, Steuben, Suffolk, Tompkins, Washington, Wayne, and Yates counties.