

Title:

The Magnitude and Distribution of Western Bean Cutworm, and the Risk to Dry Beans.

Project leader(s):

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Cooperator(s):

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Abstract:

Western bean cutworm (WBC) moth counts were monitored in traps at 10 dry bean fields in Western NY in 2018. Traps were located in Genesee, Livingston, Monroe, Ontario, Wyoming, and Steuben counties. Eight of the 10 sites were the same as in 2017 and two sites were new. Of the 8 repeated sites, all but one (Wayland) saw an increase in WBC trap catches from the previous year.

Though the overall WBC trap counts from all of NY, which includes data from the field corn, sweet corn and dry bean trapping networks (118 total traps), were down from 2017, the average trap catch at the 10 dry bean sites was up. There was a 130% increase in trap catch from 2017 (114 average moths) to 2018 (262 average moths) for the 10 dry bean sites. Of the 10 traps, nine exceeded the 100-moth threshold at which time scouting is recommended. The highest trap counts this year came from the Riga site in Monroe county. Even though this year saw the highest average trap catch since we began monitoring, no pod damage was observed in the scouted fields and no damage was found at the elevators.

Background and justification:

Western bean cutworm, a pest of both corn and dry beans, has moved east from its historic range in the Great Plains. It was first observed in NY in 2009 and its population has steadily increased. Monitoring in field corn and sweet corn began in 2010 and began in dry beans in 2012. Since then the trap catch numbers have increased and damage has been reported. Feeding damage on dry beans pods was first seen in NY in 2015 and again in 2016 and 2017. Michigan has reported economic damage of 10% in dry beans, so the potential is there for NY to experience economic damage as well. When cumulative trap catches are greater than the 100-moth threshold, scouting is recommended. However, since WBC lay their eggs on the underside of dry bean leaves and the larvae feed at night on the pods and drop to the ground during the day, scouting is very difficult. Therefore, trap catch numbers are heavily relied upon to determine areas of greatest risk.

Objectives:

Continue WBC moth trapping at 10 dry bean sites across the major dry bean production area. Determine the magnitude and timing of the WBC problem and the risk to dry beans in NY. This

includes areas where high WBC moths were caught in previous years, where WBC egg masses were seen in nearby corn, where dry bean pod feeding was seen, and where bean damage was seen.

Procedures:

WBC pheromone traps were placed at 10 sites located in the major dry bean producing region of NY, and included Genesee (1), Livingston (2), Monroe (2), Ontario (1), Steuben (3) and Wyoming (1) counties (Figure 1). Dry bean trap locations were selected by cooperators in conjunction with growers and included sites with a history of high WBC pressure from previous trapping years.

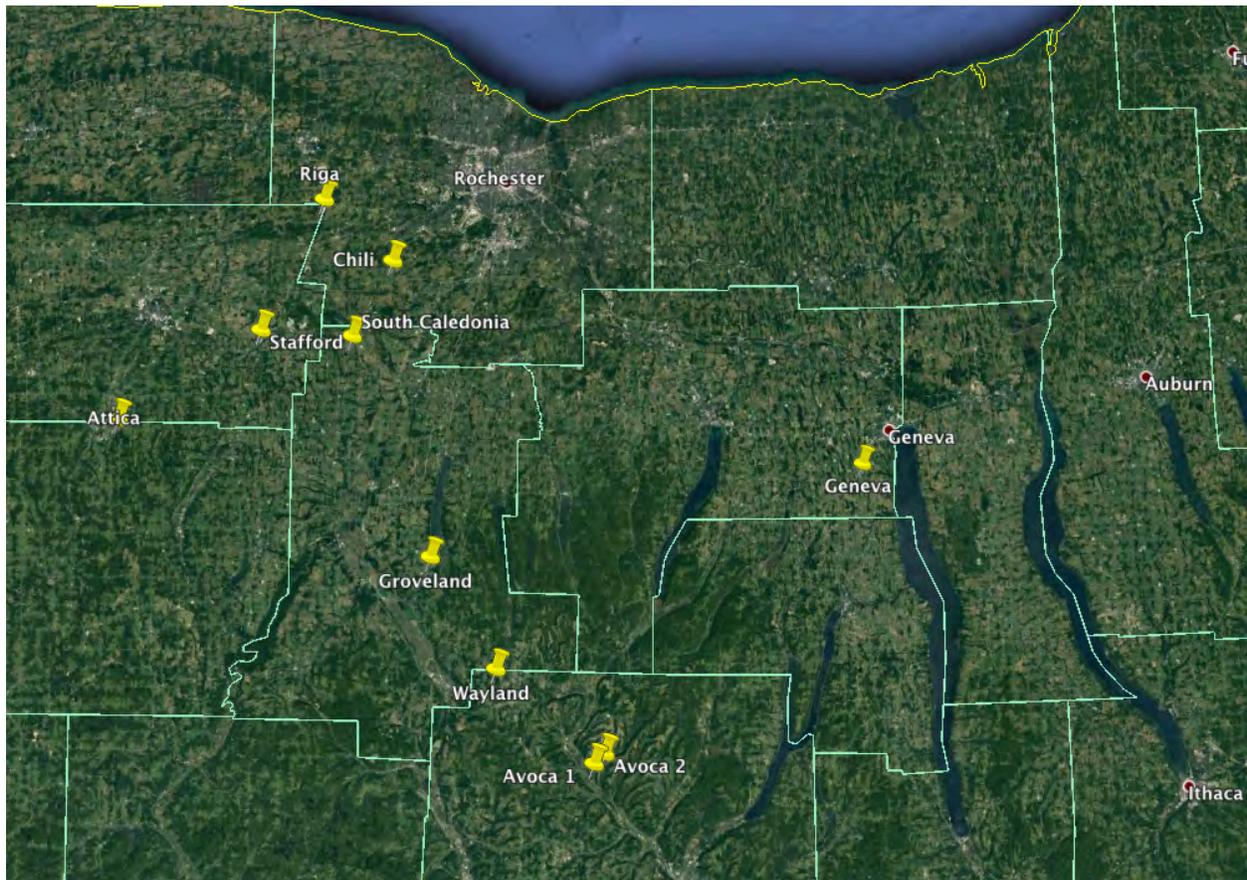


Figure 1. Location of the 10 WBC trapping sites in dry beans for 2018.

Each trapping site consisted of one commercial green bucket trap baited with a Trécé WBC pheromone lure to attract male moths and an insecticidal vaportape to kill moths once they entered the trap. Traps were hung ~4 feet from the ground in dry bean fields (that were also near corn fields) or in adjacent mowed grasses, and well away from woods, hedgerows, or other tall vegetation. Traps were placed in late June to early July depending on planting date. Traps were checked weekly and pheromone lures were replaced every two weeks until the first week of September. The methods used followed the protocol outlined by the Pennsylvania State University and the Pennsylvania Department of Agriculture WBC survey.

Trap catch for each site was used to determine the time of peak flight and whether the threshold of 100 accumulated moths was reached. When the cumulative 100-moth threshold was reached or 10 days after peak flight scouting began and alerts were posted. Alerts were sent to growers through the Sweet corn pheromone trap network blog (<http://sweetcorn.nysipm.cornell.edu/>), the Cornell Vegetable Program's VegEdge newsletter, and listservs.

Results and discussion:

Traps were set the last week of June with first trap catch reported July 3rd at the Stafford site. Peak flight occurred on July 31st, a week earlier than 2017 (Figure 2). Most of the dry bean fields were in the V8-R1 stage of development and nearby corn was in the VT- R1 stage during peak flight. WBC is most attracted to pre-tassel to tasseling corn. When the larvae initially emerge from the eggs, they feed on tassels then make their way to the corn ear. At the time of peak flight adjacent corn was in the ideal stage for WBC egg laying. Eggs and larvae were found in the adjacent corn, but no eggs or larval damage was observed in any of the dry bean fields scouted.

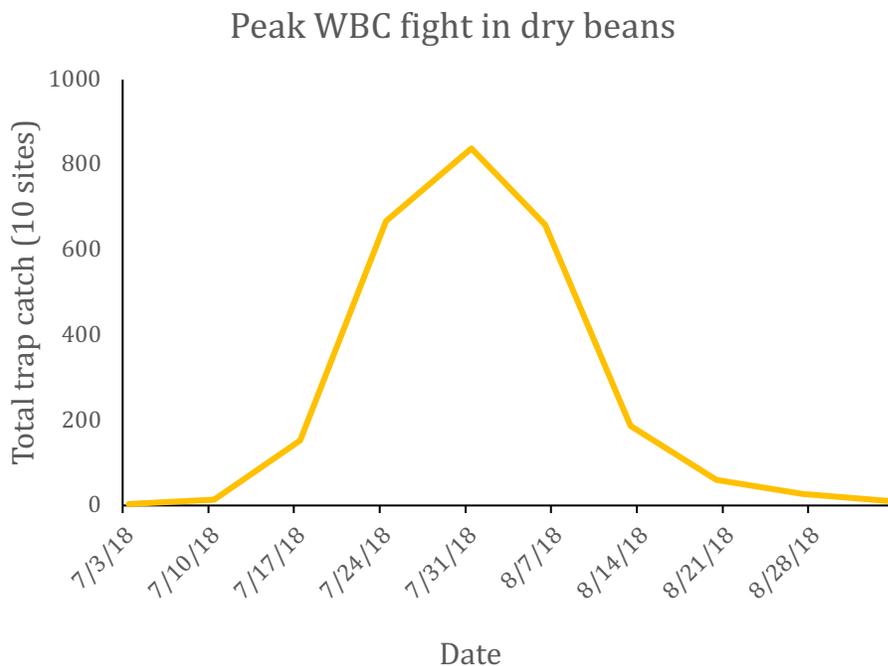


Figure 2. Peak WBC flight for ten dry bean trapping locations.

WBC monitoring in NY began in 2010 (field and sweet corn) and 2011 in dry beans. Overall trap catches have increased in NY for all three crops. In 2018 there was a drop in trap catches for both sweet corn and field corn but an increase in dry beans (Figure 3). The average trap catch in dry beans increased by 130% from 2017 to 2018 (Table 1). The highest cumulative trap catch occurred at the Riga site (465 moths) for the third year in a row. The second highest site was Groveland (428) and then Attica (395) (Table 2). Of the 10 sites monitored this year 9 reached the cumulative trap catch threshold of 100 moths.

WBC trap catch

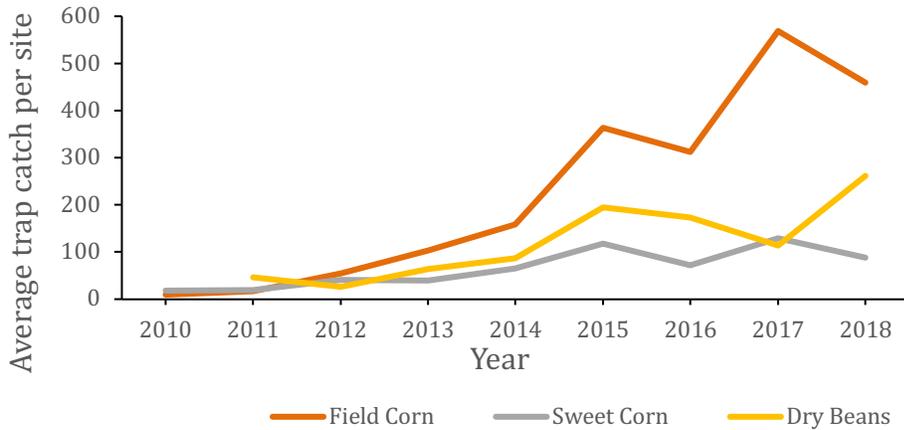


Figure 3. Average WBC trap catch in field corn, sweet corn and dry beans from 2010- 2018.

Table 1. Season total average WBC moth catches in dry bean fields, 2011-2017

	2011	2012	2013	2014	2015	2016	2017	2018
Average:	46	26	64	87	195	173	114	262

Table 2. Season total WBC moth catches at dry bean fields, 2011-2018

County	Town	2011	2012	2013	2014	2015	2016	2017	2018
Genesee	Stafford	96	16	32	60	156	193	110	271
Livingston	Caledonia (South)	19	29	64		78	161	37	149
	Caledonia (West)	22		13	6		135	148	
	Groveland	0		53	15		264	25	428
	Lima	33	57			194			
Monroe	Chili								214
	Riga	24	35	109	32	197	653	310	465
Ontario	Geneva					125	148	53	104
Steuben	Avoca 1					157	167	48	200
	Avoca 2								355
	Wayland	9	34	62	74	39	42	83	36
Wyoming	Attica	164		181	346	415	464	238	395
	Attica 2							36	
	Covington							269	
	Pavilion	56					195	111	
	Wyoming			112	105	517			

When cumulative trap catch reaches 100 moths or 10 days after peak flight scouting is recommended in dry beans. WBC lay their eggs on the underside of dry bean leaves and larvae feed at night, dropping to the soil during the day, making scouting extremely difficult. Usually only damage will be detected in dry beans. For this reason, scouting nearby corn is recommended once the 100-cumulative moth threshold is met. This gives an indication of the local WBC pressure. If feeding damage in dry beans is observed after 30 minutes of scouting Michigan and Ontario entomologists recommend an insecticide spray.

WBC migrates to NY annually but there has been an increase in overwintering survival in recent year. WBC overwinter as larvae in soil about 5 to 10 inches below the soil surface. Increased overwintering survival occurs in sandy soils, areas with reduced/no-till; mild fall, deep snow cover, and high summer humidity. Winter survival will decrease if temperatures drop below - 20 degrees F.

Project location(s):

Stafford, Genesee Co.; Groveland, Livingston Co.; South Caledonia, Livingston Co.; Chili, Monroe Co.; Riga, Monroe Co.; Geneva, Ontario Co.; Avoca, Steuben Co.; Wayland, Steuben Co.; Attica, Wyoming Co.

Samples of resources developed:

Seven WBC alerts were posted to the Sweet Corn Pheromone Trap Network Report blog (<http://sweetcorn.nysipm.cornell.edu/>) on 7/24/18, 7/31/18, 8/7/18, 8/14/18, 8/21/18, 8/28/18, and 9/4/18. There are 108 subscribers to the blog and within the last year this blog has received 3,216 page views by 750 unique visitors.

The seven alerts were emailed to dry bean growers enrolled with the Cornell Vegetable Program as well as posted in the *VegEdge* newsletter which has 435 enrollees.

Results from this trapping network along with results from field corn and sweet corn trapping networks were presented at the 9th International IPM Symposium in Baltimore.

Wise, K, M.E. Zuefle, D. Olmstead, R. Parker, J.K. Waldron, and C. MacNeil. 2018. The status of WBC in NY State. Presented at the 9th International IPM Symposium. Baltimore, MD.