

**Title:**

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

**Project leader(s):**

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**Abstract:**

Western bean cutworm (WBC) moth counts were monitored in traps at 13 dry bean fields in Western NY in 2017. Traps were located in Genesee, Livingston, Monroe, Ontario, Wyoming, and Steuben counties. Ten of the 13 sites were the same as in 2016 and three sites were new. Of the ten repeat sites 8 saw a decrease 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 (101 total traps), were up from 2016, the average trap catch at the 13 dry bean sites was down. There was a 34% decrease in trap catch from 2016 (173 average moths) to 2017 (114 average moths) for the 13 dry bean sites. Of the 13 traps, six exceeded the 100-moth threshold at which time scouting is recommended. One of the highest trap counts this year came from one of the new sites, Covington in Wyoming county, and this was also the only site of the 13 at which pod damage was observed.

**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. Michigan has reported economic damage of 10%, 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 beans 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 13 dry bean field sites across the major dry bean production area to determine the magnitude and timing of the WBC problem, and the risk to dry beans, in the major production area of 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 13 sites located in the major dry bean producing region of NY, and included Genesee (1), Livingston (3), Monroe (1), Ontario (1), Steuben (3) and Wyoming (4) 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.

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 are near corn fields) or in adjacent mowed grasses, and well away from woods, hedgerows, or other tall vegetation. One site, Attica 2, was placed at the same dry bean field as Attica (approximately 950 feet between traps) but was within 25 feet of a hedge row to test the effect of edge on trap catch. Traps were placed in late June to early July depending on planting date. It was a wet spring so many fields were delayed in planting. Traps were checked weekly and pheromone lures were replaced every two weeks until the second 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.

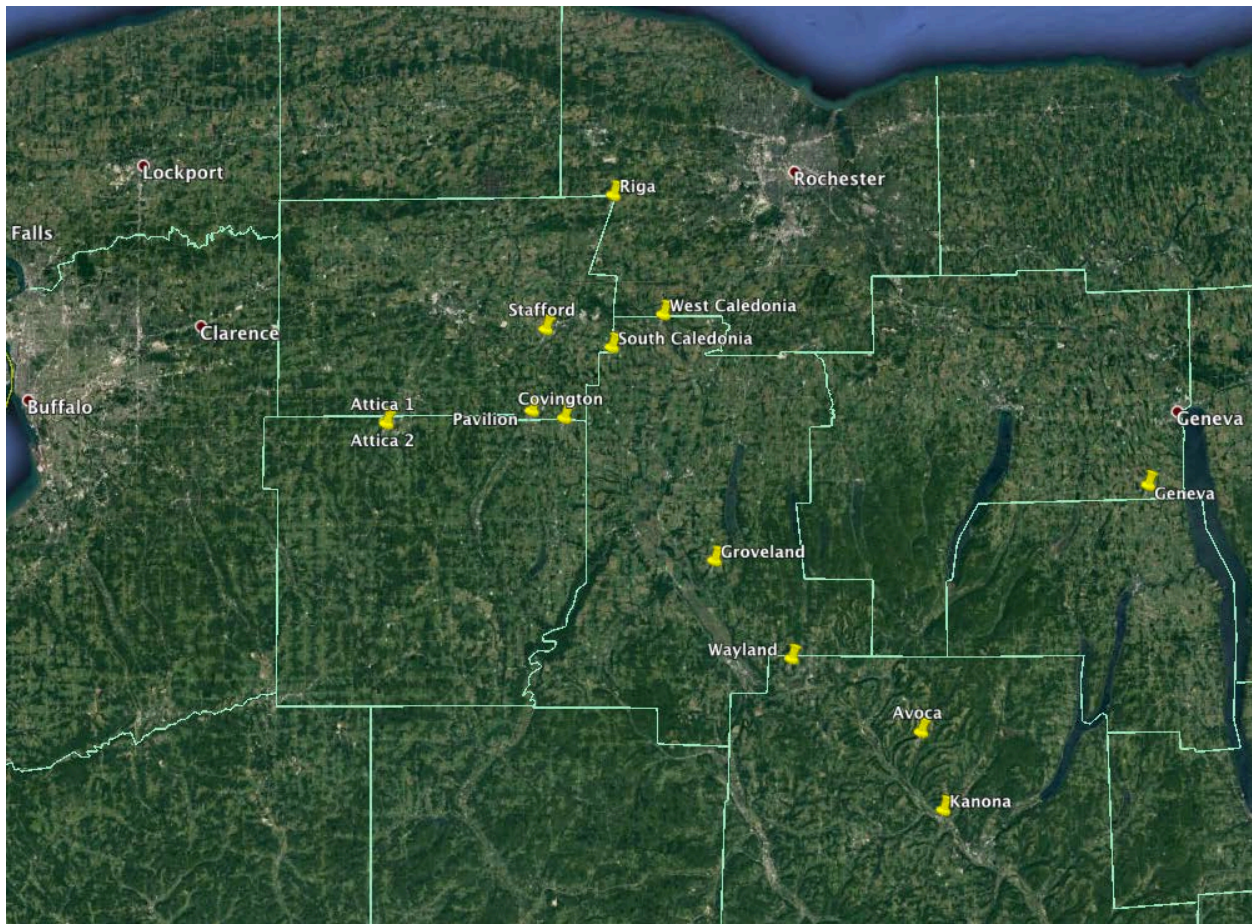


Figure 1. Location of the 13 WBC trapping sites in dry beans for 2017.

## **Results and discussion:**

WBC monitoring in NY began in 2010 (field and sweet corn) and 2011 in dry beans. The trap catches have increased every year in field corn, but showed a drop in sweet corn in 2016, with an increase again in 2017 (Figure 2). In dry beans a decrease was seen in both 2016 and 2017 (Figure 2 and Table 1). Even with a decrease over the last two years in dry beans, threshold (100 cumulative moths/trap) was reached at several of the sites.

In 2017 traps were set the last week of June with first trap catch reported July 4<sup>th</sup>. It was a very wet spring and many dry beans fields were planted late if at all. Peak flight occurred on August 8<sup>th</sup> when most of the dry bean fields were in the R3 stage of development and nearby corn was in the R2 stage. WBC is most attracted to pretassel corn which was not present during peak flight. This would indicate that dry beans might have been at greater risk, but we found only one site with possible pod feeding (Covington site) and no damage was observed at the elevators.

The highest cumulative trap catch occurred at the Riga site (310 moths), followed by the new Covington site (268) and then Attica (238) (Table 2). The Attica site was paired this year with another trap located at the same field but within 25 feet of hedge row. This trap caught only 36 moths for the entire season as compared to the 238 caught 950 feet away. This shows the importance of proper trap placement away from any tall vegetation that may affect trap catch. Of the 13 sites monitored this year 6 reached the cumulative trap catch threshold of 100 moths. However, only two of the ten repeat sites, west Caledonia and Wayland, saw an increase in cumulative trap catch.

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.

## WBC trap catch

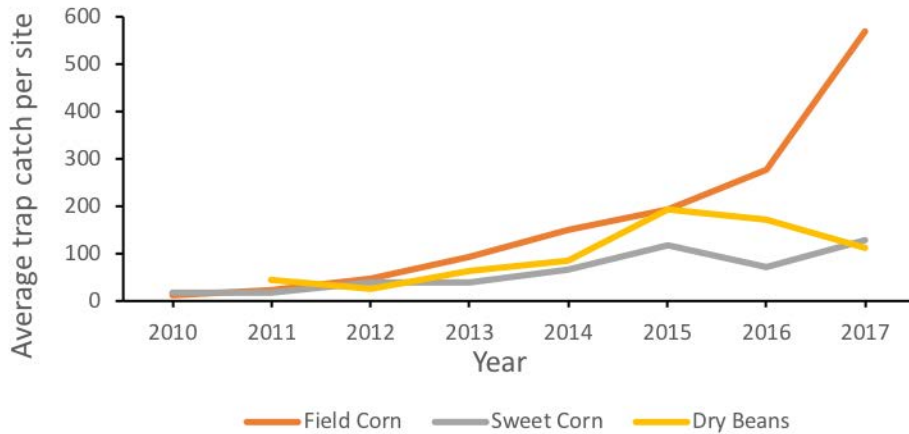


Figure 2. Average WBC trap catch in field corn, sweet corn and dry beans from 2010- 2017.

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

	2011	2012	2013	2014	2015	2016	2017
<b>Average:</b>	46	26	64	87	195	173	114

Table 2. Season total WBC moth catches at dry bean fields, 2011-2017

County	Town	2011	2012	2013	2014	2015	2016	2017
<b>Genesee</b>	Alexander			63				
	Batavia		23					
	Stafford	96	16	32	60	156	193	110
<b>Livingston</b>	Caledonia (South)	19	29	64		78	161	37
	Caledonia (West)	22		13	6		135	148
	Cuylerville		9					
	Dansville						78	
	Groveland	0		53	15		264	25
	Lima	33	57			194		
	Sparta					75		
<b>Monroe</b>	Mendon	49						
	Mumford	24						
	Riga	24	35	109	32	197	653	310
<b>Ontario</b>	Geneva					125	148	53
	Hopewell	59	8		55			
<b>Steuben</b>	Avoca					157	167	48

	Cohocton Hill							25
	Cohocton Flat							13
	Cohocton (North)							151
	Howard							6
	Howard Hill							72
	Kanona							10
	Wayland	9	34	62	74	39	42	83
<b>Wayne</b>	Penfield			2				
<b>Wyoming</b>	Attica	164		181	346	415	464	238
	Attica 2							36
	Covington							269
	Pavilion	56					195	111
	Wyoming			112	105	517		
	Benton			10				

**Project location(s):**

Stafford, Genesee Co.; Groveland, Livingston Co.; West Caledonia, Livingston Co.; South Caledonia, Livingston Co.; Riga, Monroe Co.; Geneva, Ontario Co.; Avoca, Steuben Co.; Kanona, Steuben Co.; Wayland, Steuben Co.; Attica, Wyoming Co.; Covington, Wyoming Co.; Pavilion, Wyoming Co.

**Samples of resources developed:**

WBC alerts were posted to the Sweet Corn Pheromone Trap Network Report blog (<http://sweetcorn.nysipm.cornell.edu/>) on 8/15/17, 8/22/17, 8/29/17, 9/5/17, 9/12/17.

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 alerts were also posted in the *VegEdge* newsletter which has 435 enrollees.