

Managing Western Bean Cutworm with Bt's- A Reality Check

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The Western Bean Cutworm (WBC) is an emerging pest in NY that has the potential to cause economic losses in field corn, sweet corn and dry beans. Since 2010, the presence of WBC moths throughout the state have been monitored using bucket traps with pheromone lures. Based on these WBC trap monitoring efforts, Northern New York (NNY) is considered a "hot spot" for the Western Bean Cutworm in New York State.

Current management strategies available for the control of WBC in corn would be the use of foliar insecticides or selecting transgenic corn hybrids with specific Bt traits. Foliar insecticide treatments are effective but can be difficult to time applications correctly. Two Bt events, Cry 1F and Vip 3A have been reported to have activity on WBC. There is a growing concern from corn growers and agribusinesses in Northern New York that the WBC feeding on corn ears can lead to increased mycotoxin levels. There have also been reports from Michigan, Indiana, Ohio and Ontario, Canada suggesting varying levels of control of WBC with the Bt corn trait containing the Cry 1F protein.

Bt corn hybrids with the Cry 1F Bt trait is found in Herculex 1 and Xtra; most Acremax (AM), Intrasect and TRisect; and Agrisure E-Z Refuge products (3122, 3220, 5122, 5222). Refer to the University of Wisconsin- Madison and Michigan State University "Handy Bt Trait Table (April 2106 version)" found at <http://bit.ly/1Qq3AKf>. For those that do not have access to the internet and would like a print copy of the table referenced please contact your local Cornell Cooperative Extension office.

The Cornell Cooperative Extension Northern New York Regional Agriculture Team initiated an on farm research project titled "Evaluation of the Efficacy of Bt Corn for the Control of Western Bean Cutworm in NNY". In 2016, four large scale replicated corn trials were planted on farms in Jefferson, Lewis and Franklin counties. Comparisons of different Bt corn traits for the control of Western Bean Cutworm, identification of ear molds on WBC damaged corn ears and corn grain samples from the different treatments were tested for the presence of mycotoxins.

Based on our on farm research findings in NNY, it can be determined that varying levels of WBC control from the Cry 1F trait was confirmed in New York corn fields. Results from two of the sites (Table 1 and 2) showed that the Cry 1F Bt trait provided no control of the WBC when compared with the susceptible corn variety planted in the trial. Another site (Table 3) demonstrated that Cry 1F hybrid provided suppression, but not control of the WBC. The earliest planted trial (Table 4) had minimal to no WBC damage across all treatments. The lack of Western Bean Cutworm presence in the corn at this site was likely due to the fact that the corn had tasseled prior to the arrival of the WBC moths in the season. The WBC moths do not like to lay eggs on corn with emerged tassels.

Table 1. Copenhagen site, Jefferson Co.

Type of Bt(s)	WBC Damaged Ears %
Cry1F + Vip 3A	0 b
Vip 3A	0 b
Cry 1F	21.5 a
Cry 1A.05 + 2Ab2	13.5 a

WBC Trap Count: 553
Planted May 17, 2016

Table 2. Turin site, Lewis Co.

Type of Bt(s)	WBC Damaged Ears %
Cry1F + Vip 3A	0 b
Vip 3A	0 b
Cry 1F	18.75 a
Cry 1A.05 + 2Ab2	18.00 a

WBC Trap Count: 190
Planted May 21, 2017

Table 3. Nicholville site, Franklin Co.

Type of Bt(s)	WBC Damaged Ears %
Cry1F + Vip 3A	0 b
Vip 3A	2.25 b
Cry 1F	9.75 ab
Cry 1A.05 + 2Ab2	21.25 a

WBC Trap Count: 756
Planted May 25, 2017

Table 4. Chateaugay site, Franklin Co.

Type of Bt(s)	WBC Damaged Ears %
Cry1F + Vip 3A	0 a
Vip 3A	0 a
Cry 1F	1.75 a
Cry 1A.05 + 2Ab2	1.25 a

WBC Trap Count: 313
Planted May 11, 2017

Photo 1.



The feeding damage of the Western Bean Cutworm larva is typically limited to ear tip kernel feeding (Photo 1). While this trial was not designed or set up to evaluate yield losses attributed to the Western Bean Cutworm, we do not feel that corn yields were affected by WBC feeding damage found at any of these locations. At the current WBC damage levels observed in NNY, it is not likely that WBC has reduced corn yields.

One of the concerns corn growers have is that the kernel feeding damage from the WBC larva presents an opportunity for favorable pathogen growth. If the environmental conditions are right, this could lead to mycotoxins developing in the damaged grain. Six ear molds and rots were identified on the damaged corn ears in the trial. We found Fusarium Ear Rot, Gibberella Ear Rot, Rhizopus Ear Rot, Pennicillium Ear Rot, Trichoderma and Cladosporium. Some of these were likely attributed to the WBC damage. We also collected corn grain samples from each treatment in the individual trials and sent them to Dairy One for a mycotoxin panel screening. Despite as much as 21.5% of the ears damaged, there were no mycotoxins detected in corn grain samples from this on farm research project.

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If you have any further questions or would like more information about this on farm research project feel free to contact Mike Hunter (315)788-8450 or Kitty O'Neil (315)379-9192.