Western Bean Cutworm in Michigan: Update on corn research from 2010

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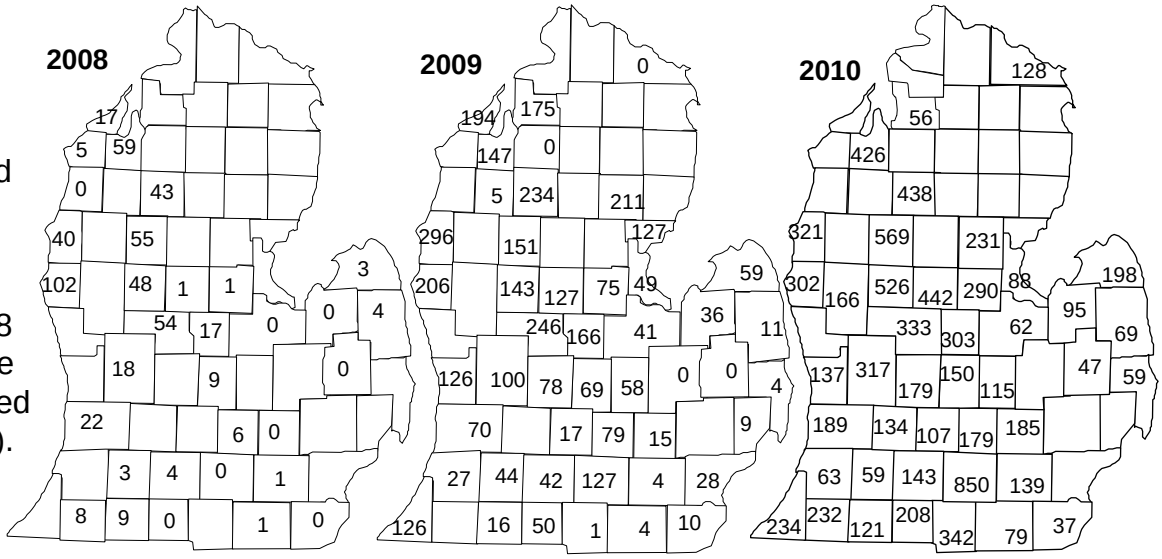
Chris DiFonzo & Megan Chludzinski – Department of Entomology
Fred Springborn – MSUE Montcalm County
Michigan State University, East Lansing, MI 48824

Thanks to cooperators throughout the state, and funding from the Corn Marketing Program, Western Bean Cutworm (WBC) numbers and flight were monitored in 2010 at 346 locations.

A total of 78,367 moths were captured in 2010. Trap catch peaked the third week of July.

Compared to 2008 and 2009, average trap catch remained high (figures right).

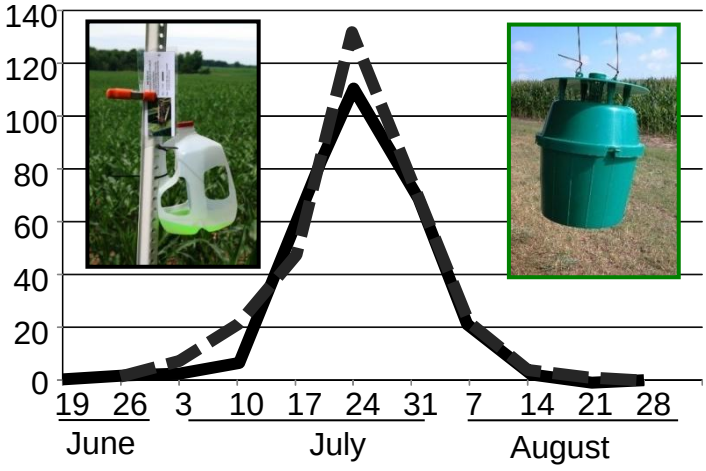


Several trap choices for 2011

Milk jugs pheromone traps have been used to monitor WBC. The jug traps are free and easy to make, but must be refilled with water or anti-freeze frequently. Milk jugs typically last only one season. In 2010, we compared moth catch in milk jugs to green bucket traps at a dozen locations. Trap catch was similar in number and timing. The bucket traps are easy to use, require no liquid, and can be reused. However, they must be purchased (~$10 each).

To order WBC pheromone and bucket traps, contact **Great Lakes IPM** in Vestaburg, MI: www.greatlakesipm.com 1-800-235-0285

Moth catch in milk jug (solid line) versus bucket (dashed line) traps



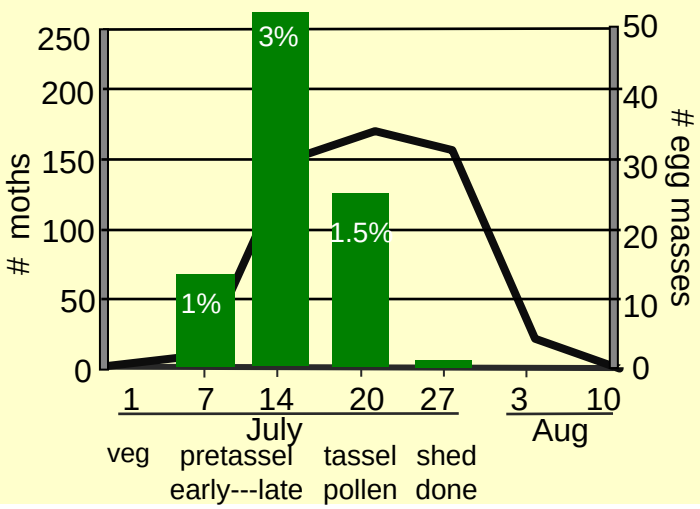
Managing WBC – Bt efficacy trial in central Michigan

Efficacy trials from 2010 provided information on WBC control in Bt corn. The trial was planted on 4 May in an irrigated field in Montcalm County. Both first 1st generation European corn borer and WBC infested the field. WBC flight was monitored with milk jug traps and plots were scouted weekly for WBC egg masses. At the end of the season, ear feeding and yield were measured.

Field Crops Entomology Michigan State University
Corn Marketing Program of Michigan
Michigan Corn Growers Association
The Michigan Bean Commission

Crop stage and infestation level

Moth flight peaked at the trial site between July 7 and July 27 (black line on graph). Females preferred to lay eggs on pre- tassel and tasseling corn (July 7, 14, 20). Once pollen shed ended, egg laying shut down in the field (July 27) although large number of moths were still flying. This clearly demonstrates ***the importance of crop stage* in infestation**. Differential attractiveness for egg laying explains why adjacent fields or different parts of the same field can have very different levels of WBC feeding.



The percentage of plants with egg masses in the trial did not exceed the current 5% WBC threshold on any single date (1%, 3%, and 1.5% on July 7, 14, and 20), but if ***egg mass counts were accumulated*** over three weeks, the final percent infestation was 5.5%.

Infestation differs with type of Bt

All the Bts tested in the Montcalm trial gave excellent corn borer control, but only hybrids with the Cry1F controlled WBC. With only a 5.5% initial infestation, a majority of ears were damaged and moldy in non-Bt and VT3P corn and yield was reduced. Herculex and SmartStax ears were significantly cleaner, however feeding was not completely eliminated. **Cry1F provides moderate protection against WBC, but it isn't perfect**. It is important to assess WBC damage and quality in both Bt and non-Bt fields.

Type of hybrid	Type of Bt(s)	Expected WBC control	plants 1st gen. ECB	ears with feeding	ears with ear rot	#kernels eaten per ear	Yield differ-ence
Non Bt	none	none	14%	84%	71%	16	-18 bu
VT3P	Cry1A.05 + 2Ab2	none	0	74%	66%	14	-8 bu
Herculex	**Cry1F**	moderate	0	37%	24%	10	**Avg 239 bu/ac**
Smart Stax	Cry1A.05 + 2Ab2 **Cry1F**	moderate	0	51%	19%	8	

Kernel damage and ear rot on non-Bt corn. Damage along the side of the ear is characteristic of WBC feeding

Gibberella ear rot on Cry1F corn. A WBC larva chewed through the husk along the side of the ear, allowing the pathogen to enter.

Recommendations for 2011

- Bts differ widely in efficacy against WBC. Know which Bt hybrid you planted and what to expect from it. Note that quality is a potential concern even for Cry1F hybrids.
- Crop stage is key to infestation. Target pre-tassel/ tasseling corn for scouting during moth flight.
- Accumulate % egg masses over several weeks towards the 5% threshold.
- Walk fields before harvest to detect quality issues. Do not store damaged /moldy grain on-farm.