Western Bean Cutworm in Ontario

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Agriculture Development Branch, OMAFRA

Western Bean Cutworm History

- *Striacosta albicosta* (Smith)
- Specimen collected in Arizona in 1887
- Damage documented in dry beans in Colorado and Idaho in 1940s
- Significant damage in corn in Nebraska by 1970s
- Sporadic damage on occasion in Iowa but no noticeable expansion until 1999

Rapid spread across Mid-West US and Eastern Canada

State/Province	Date	Source
Minnesota	1999	(O'Rourke & Hutchison 2000)
Illinois	2004	(Dorhout & Rice 2004)
Missouri	2004	(Dorhout & Rice 2004)
Wisconsin	2004	(Cullen 2007)
Indiana	2006	(Dorhout & Rice 2008)
Michigan	2006	(DiFonzo & Hammond 2008)
Ohio	2006	(DiFonzo & Hammond 2008)
Ontario	2008	(Baute et al. 2009)
Pennsylvania	2009	(Baute et al. 2009)
New York	2009	(Baute et al. 2009)
Québec	2009	(Baute et al. 2009)

Western Bean Cutworm Seasonal Cycle

Over winter in soil chambers

Pupae

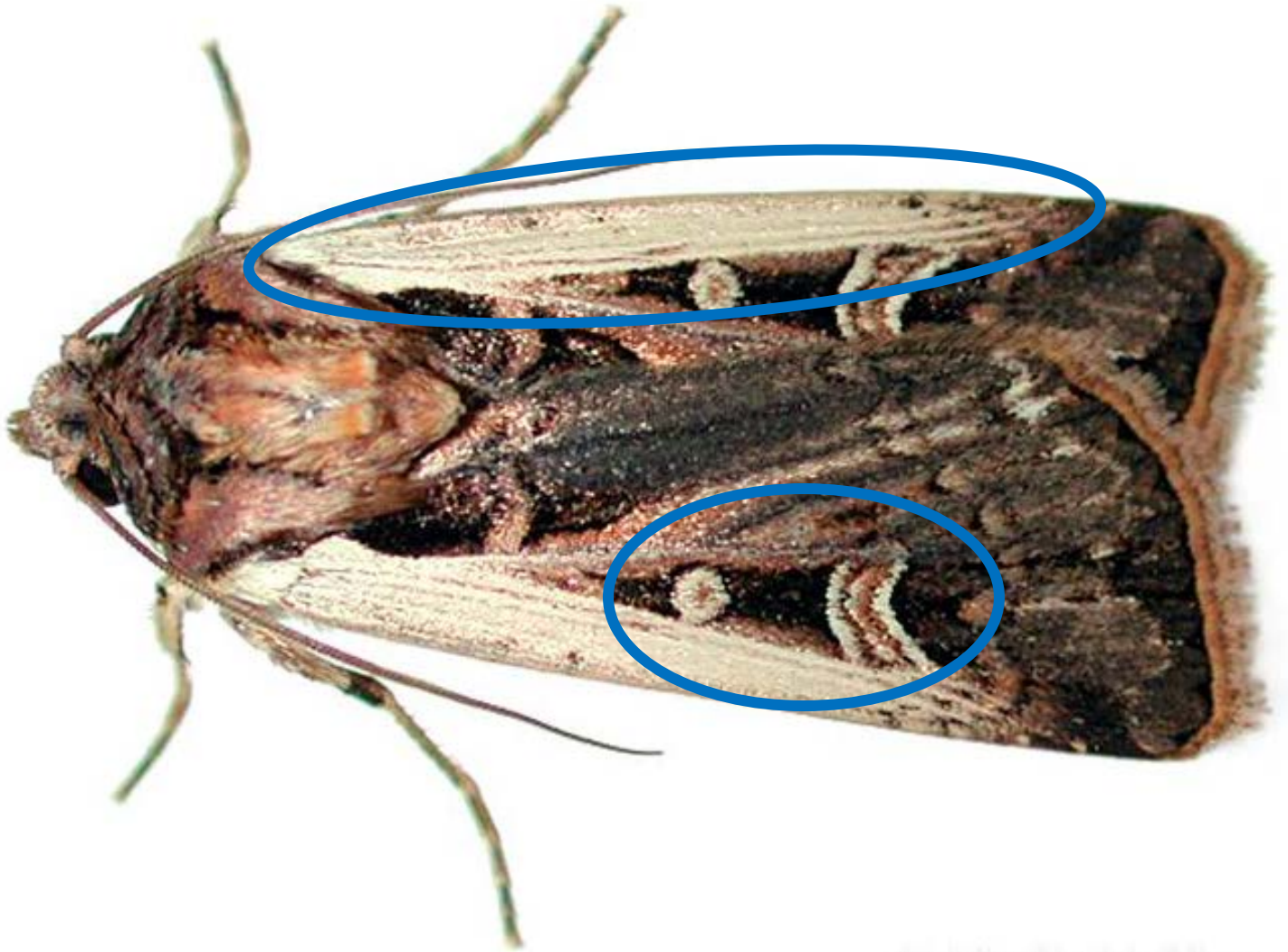
Adults

Egg laying

Larvae

Damage

April May June July Aug. Sept. Oct.

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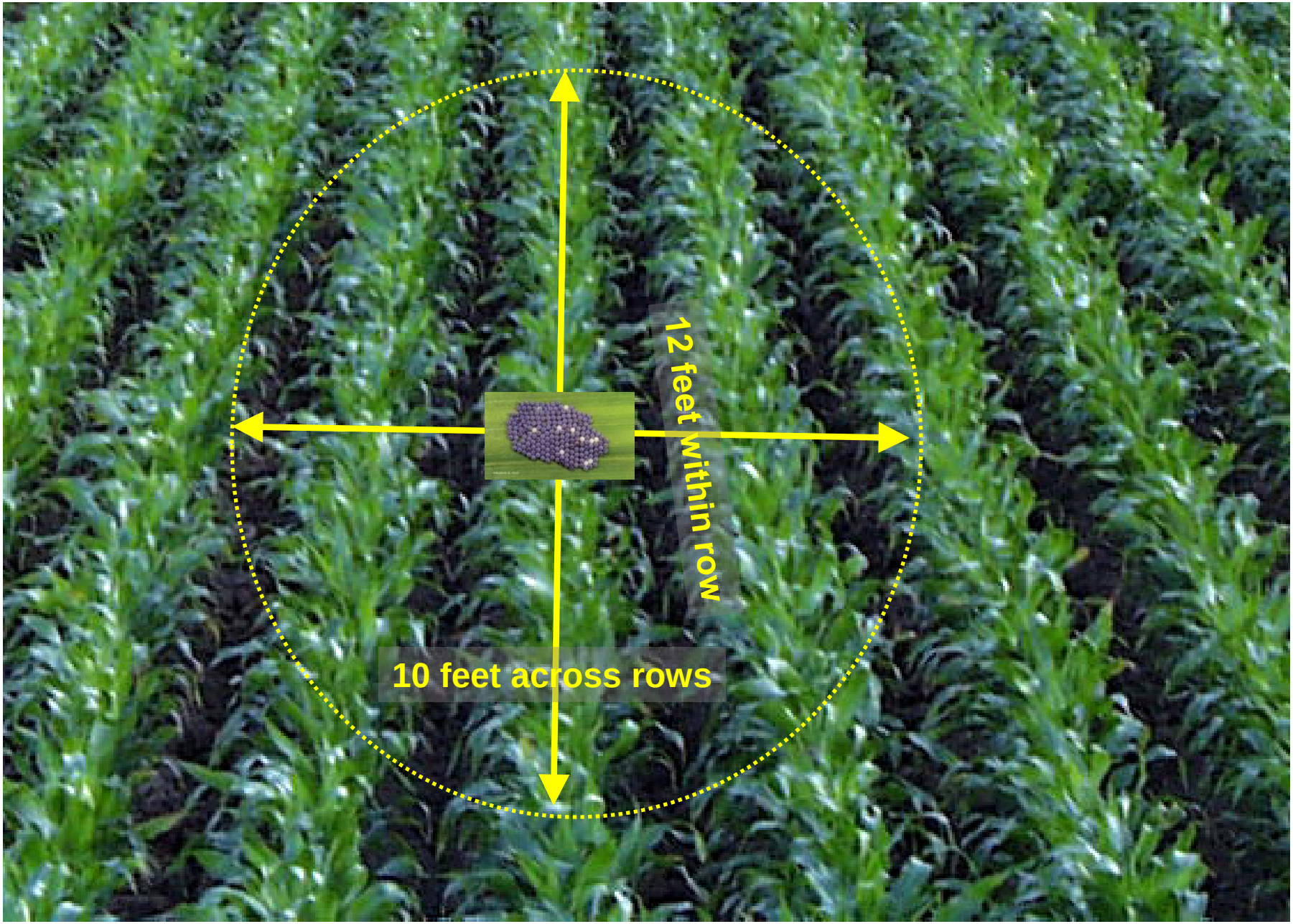
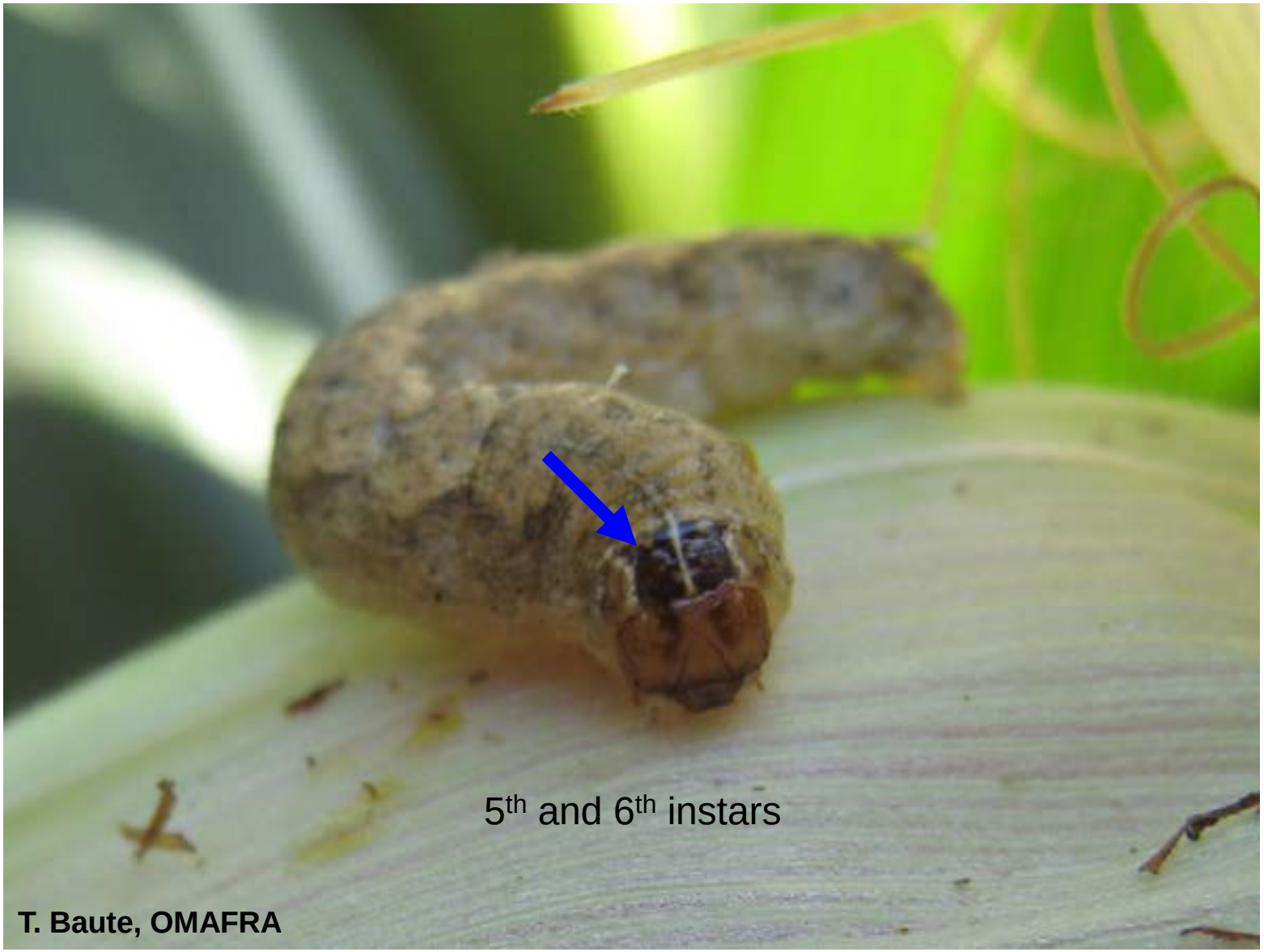


Larval dispersal

Western bean cutworm larva

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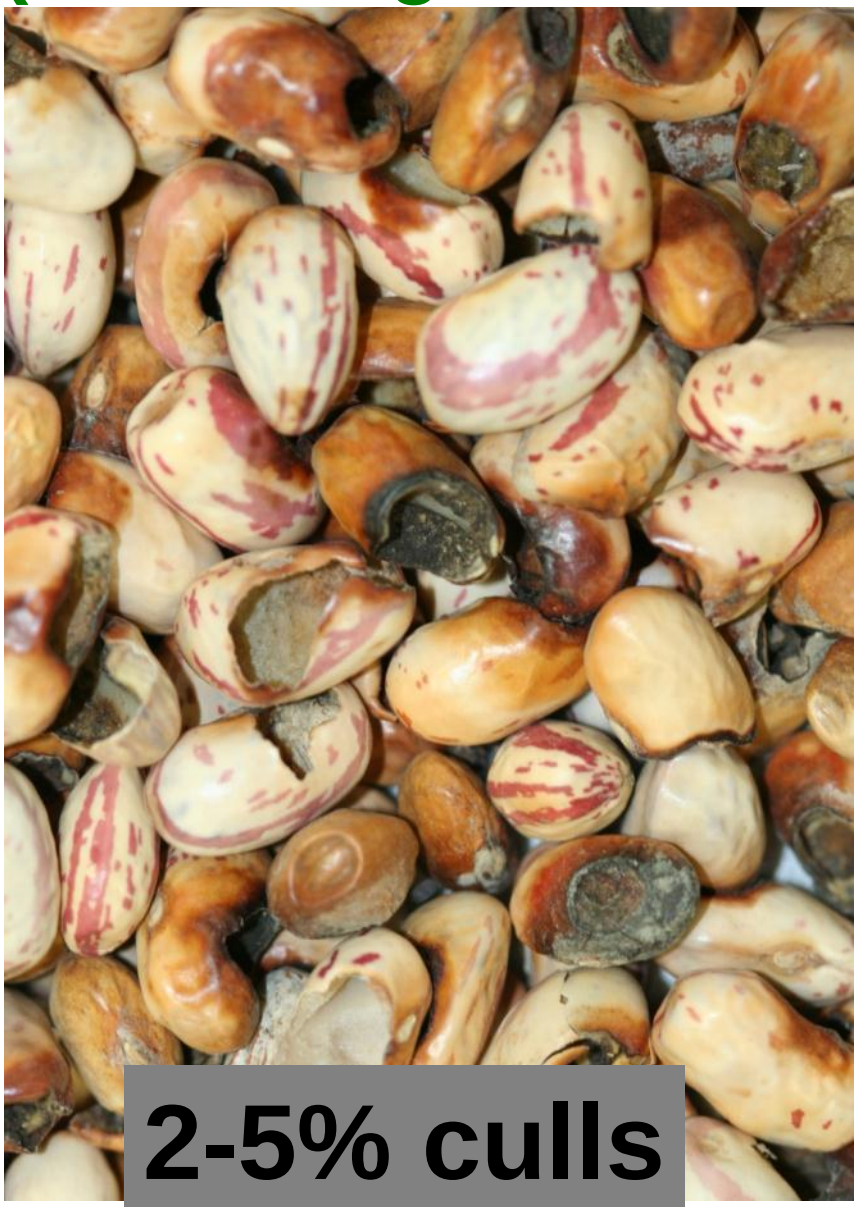
Larvae chew into pods

Damage to commercial beans

(from Greg Varner – MI Bean Commission)



Research Collaborators

- Dr. Art Schaafsma, UGRC (PI)
- Chris Gillard, UGRC
- Jocelyn Smith, UGRC, PhD candidate
- Lindsey Goudis, MSc candidate
- Dr. Rebecca Hallett, University of Guelph
- Cheryl Trueman, UGRC
- Elaine Roddy, OMAFRA
- Dr. Jeremy McNeil, Western University

Research Objectives 2010 - 2013

1. Determine the distribution and overwintering success of WBC.

2. Determine the phenology of WBC in the Great Lakes Region.

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3. Determine the host range of WBC.

4. Evaluate the efficacy of foliar insecticides in corn, dry beans, vegetable crops and transgenic corn for WBC control.

5. Establish economic thresholds for WBC in dry beans and corn.

6. Develop comprehensive best management practices for WBC in Ontario.

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WBC Pheromone Trapping

CANADIAN CORN PEST COALITION

LA COALITION CANADIENNE CONTRE LES RAVAGEURS DU MAÏS

www.cornpest.ca

WBC Trap Network

An extensive network of Western Bean Cutworm (WBC) traps across Ontario will be used to detect the peak adult moth flights of this corn and dry bean pest. Trap catches will guide field scouting activities and the timing of management of WBC and will also be used to determine the extent of the expanding distribution of WBC.

Watch for weekly maps showing updates on trap catches province-wide (here).

Submit WBC Counts

Submit Counts Online
(preferred method)

Fax
(printable PDF version)

WBC Scouting and Training Material - Presentations

Click on the title above for more resources and presentations related to Western Bean Cutworm (WBC), including VERY useful tools for identifying WBC.

Trapping WBC - Instructions

Click on the title above to access trapping instructions and training materials.

Weekly Maps of Average Corn Growth Stages and WBC Trap Catches

Click on the title above to access Weekly Maps of WBC Trap Catches, Corn Growth Stages and links to Michigan and Ohio data.

Archives located under the above title - ** **In the Archives section are all previous year's WBCTN Participant's Reports.** **

WBC Trap Network Success

Year	# Traps	Moths Captured
2010*	471	59582
2011	621	159076
2012	395	126962
Totals	1487	345620

*2010 captured most northern moth on record (Timiskaming)

Western Bean Cutworm Trap Network 2012

Trap Catches for Week 9 (July 15-21)

= Sweet Corn

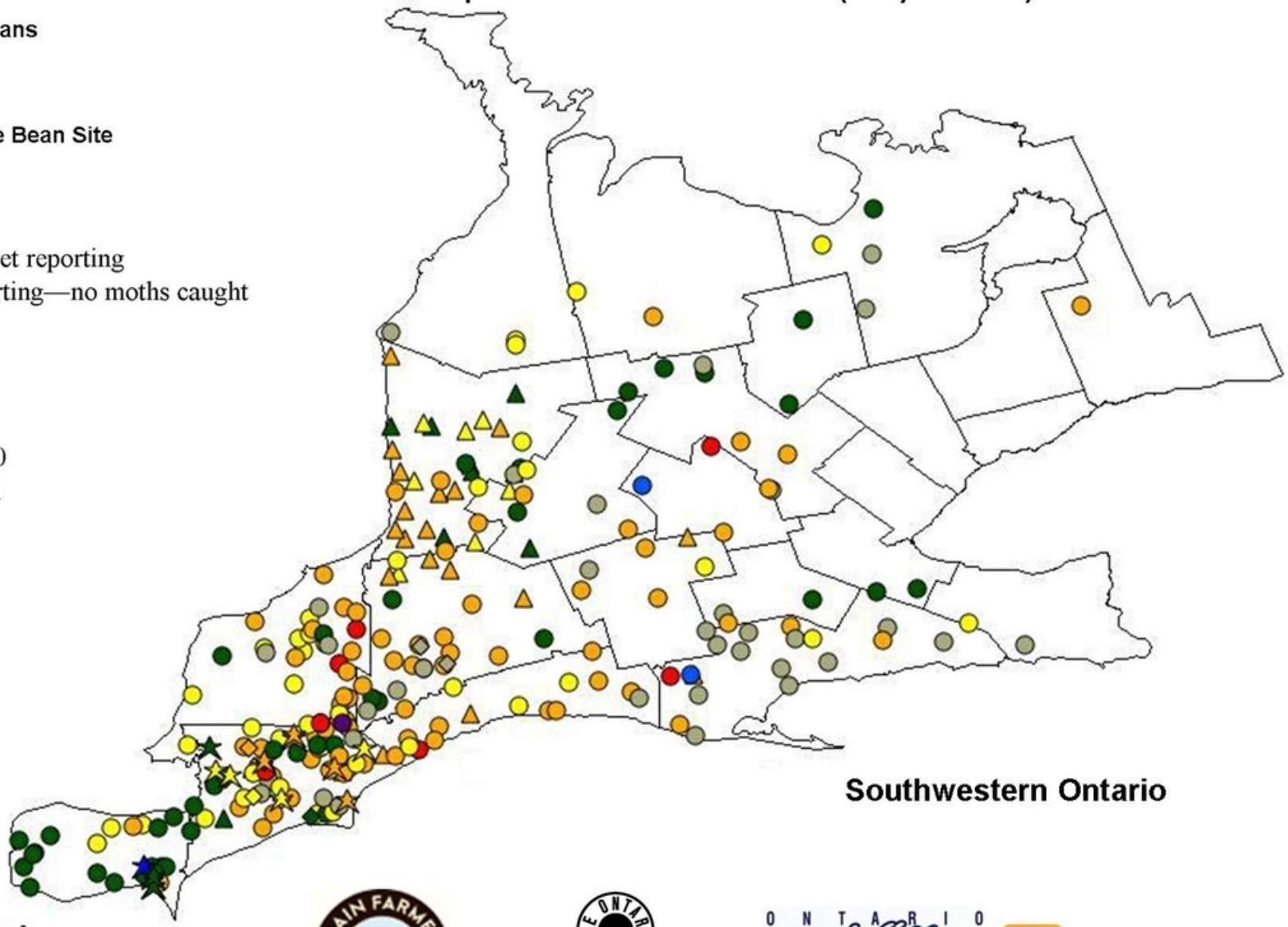
= Snap Beans

= Corn Site

= Dry/Edible Bean Site

Legend

- Trap not yet reporting
- Trap reporting—no moths caught
- 1 - 50
- 51 - 100
- 101 - 500
- 501 - 750
- 751 - 1000
- Over 1001



Southwestern Ontario

Agricultural Adaptation Council

Ontario

Grain Farmers of Ontario

The Ontario Coloured Bean Growers Association

Ontario White Bean Producers

Laresco

Western Bean Cutworm Trap Network 2012

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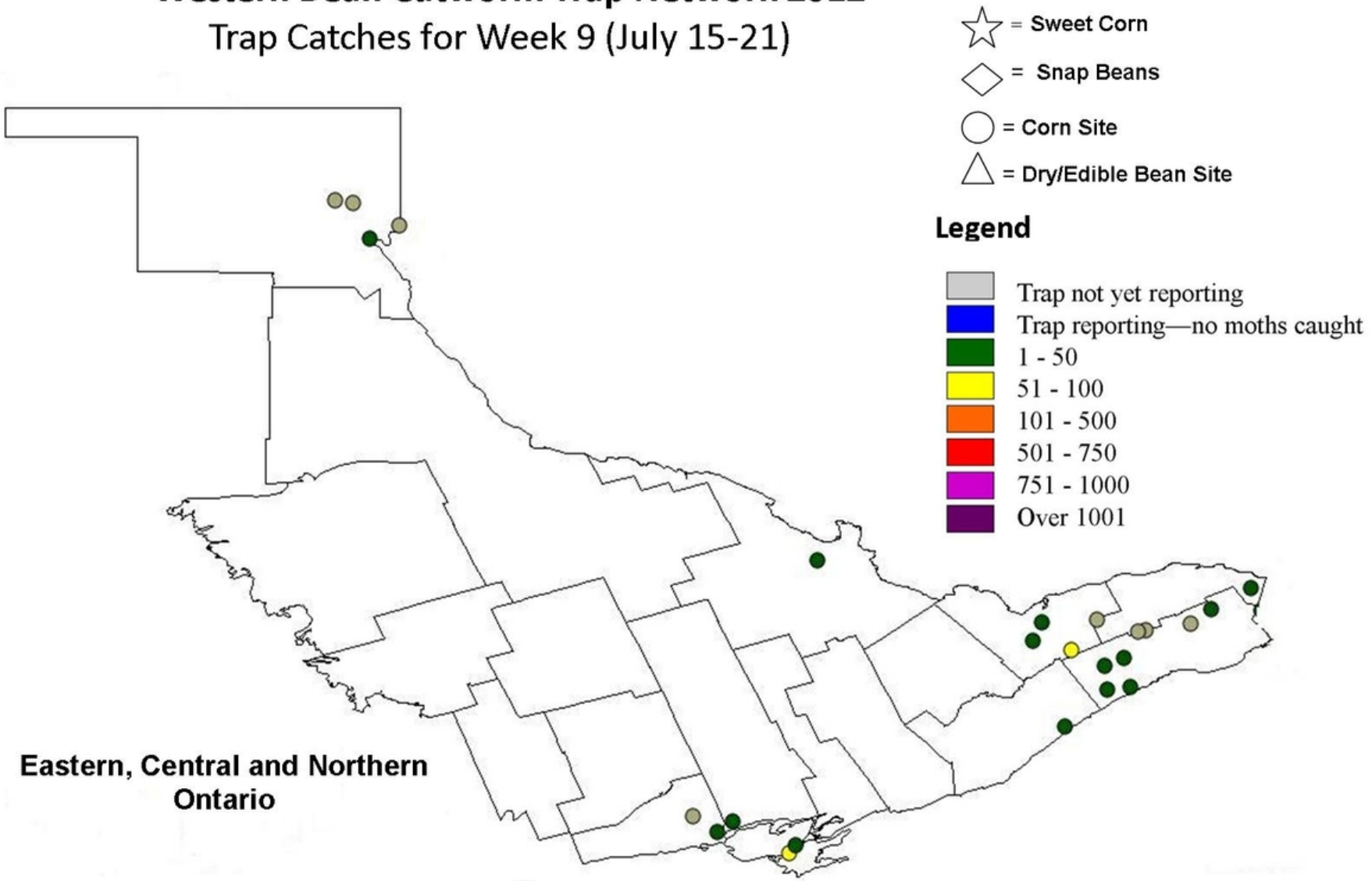

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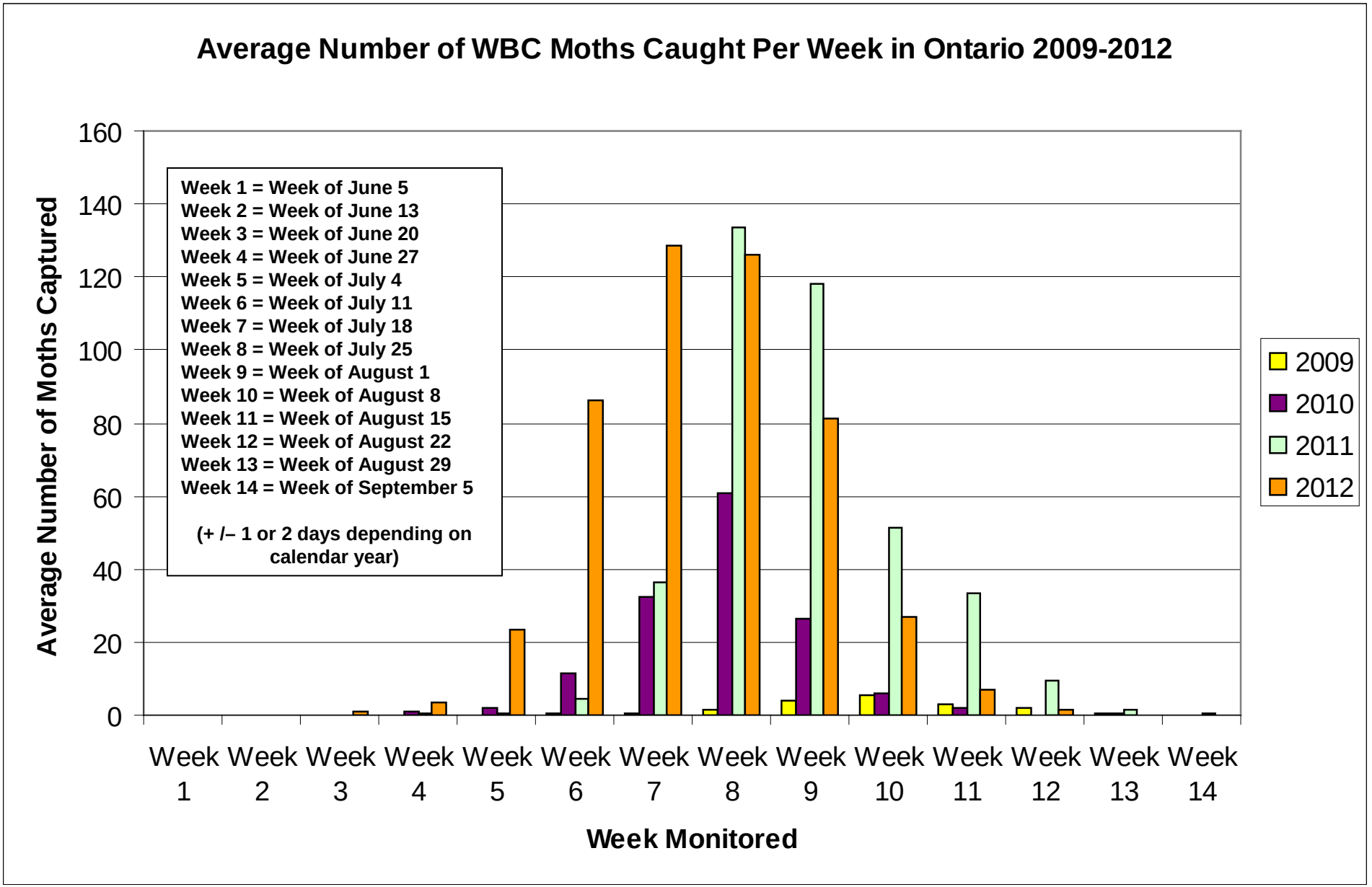

Average Number of WBC Moths Caught Per Week in Ontario 2009-2012
Average Number of Moths Captured
160
140
120
100
80
60
40
20
0
Week 1 = Week of June 5
Week 2 = Week of June 13
Week 3 = Week of June 20
Week 4 = Week of June 27
Week 5 = Week of July 4
Week 6 = Week of July 11
Week 7 = Week of July 18
Week 8 = Week of July 25
Week 9 = Week of August 1
Week 10 = Week of August 8
Week 11 = Week of August 15
Week 12 = Week of August 22
Week 13 = Week of August 29
Week 14 = Week of September 5
(+ /– 1 or 2 days depending on calendar year)
2009
2010
2011
2012
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week Monitored

Pre-pupa within a soil chamber

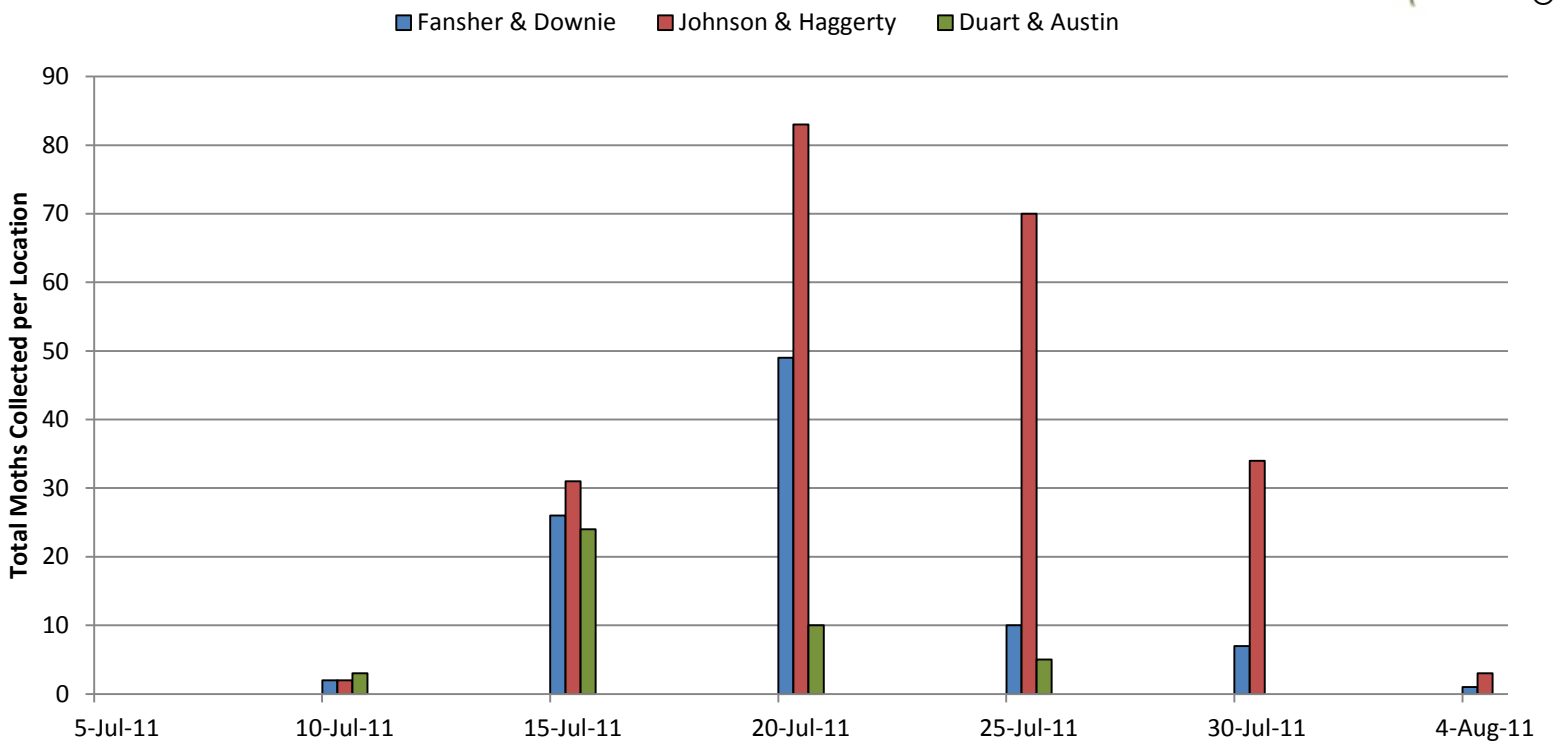
Photo by J. Obermeyer

WBC: Emergence 2011 Bothwell

Jocelyn Smith, UGRC

WBC Emergence 2011 - Bothwell

© Marlin E. Rice



- Average ~ 2 moths/m^2 emerged
- Emergence from 5 July to 2 August
- Peak emergence during the week of 18-25 July

Research Objectives

3. Determine the host range of WBC.

- 3.1. Evaluate field and vegetable crop and weed species for successful WBC development and potential as hosts of WBC.

WBC Host Range Study

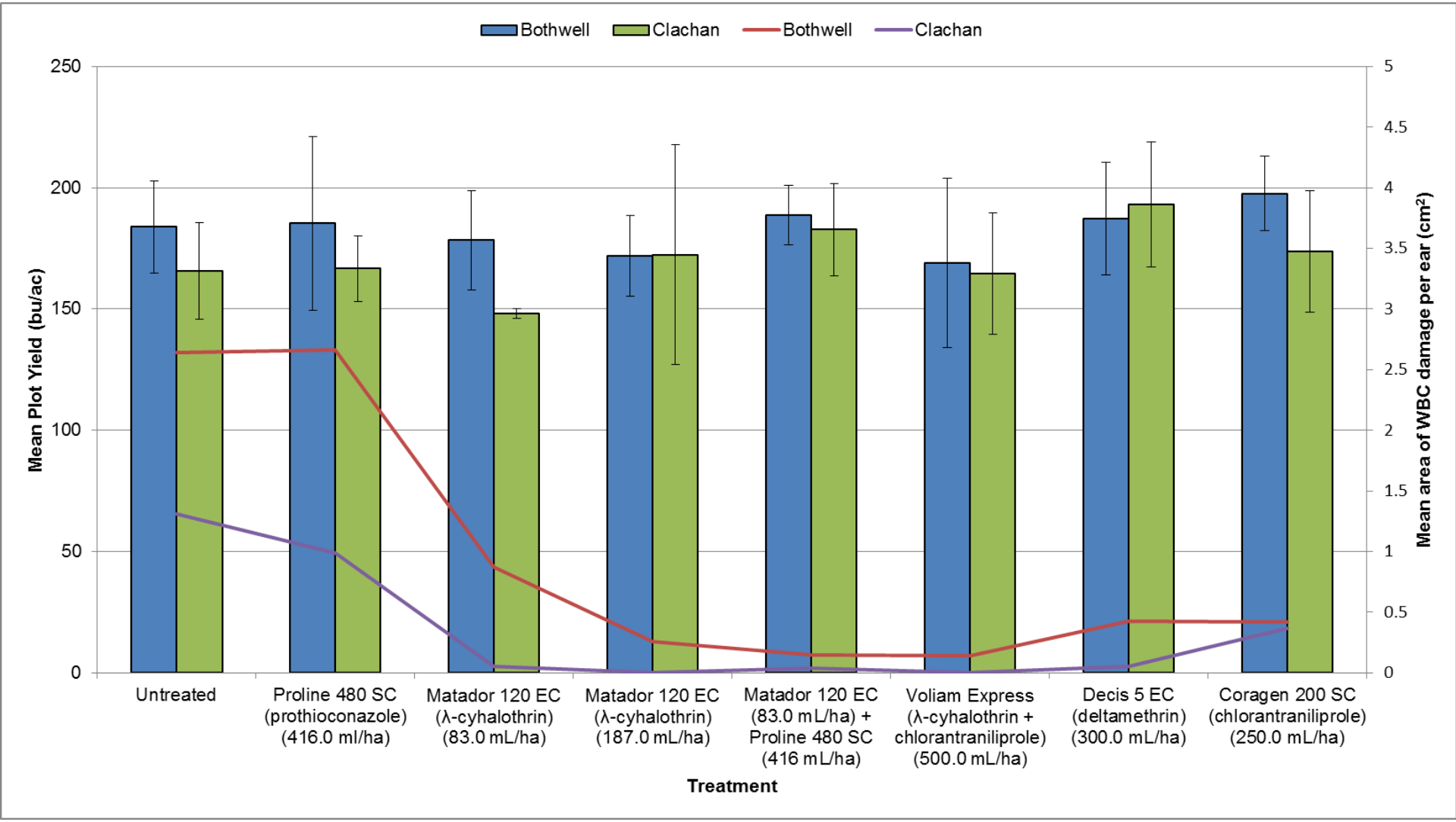
- UGRC and MSU
- Lab no-choice assay
  - Newly hatched larvae fed leaf tissue from 26 different host plants
  - % survival measured at 31 days
- Field no-choice assay
  - Newly hatched larvae caged on host plants
  - Larvae recovered, measured and weighed at 28-32 days

WBC Survival

- High
  - Dry beans
  - Peas
  - Lamb's quarters
  - Eastern black nightshade
  - Red root pigweed
  - Cucumber
  - Squash
- Medium
  - Soybean
  - Green beans
  - Hot pepper
- Low
  - Tomato
  - Potatoes
  - Bell pepper
  - Hairy Crabgrass
  - Green Foxtail
  - Velvetleaf

Table 1. Parameters of field trials to evaluate management strategies for Western bean cutworm in field corn in Ontario in 2011.

	Bothwell	Clachan
Planting date	7 May 2011	4 June 2011
Cultivar (CHU)	N53W (3150 CHU)	DKC 43-61 (2800 CHU)
Bt event	Cry 1Ab	Cry 1Ab
Application date	27 July 2011	26 July 2011
Wind speed, air temp, RH	2.9 km/h W, 21.9°C, 65.3%	2.4 km/h N, 28.8°C, 71.2%
Machine harvested area per plot (m)	2.28 x 16.8 (0.004 ha)	1.9 x 16.8 (0.008 ha)
% Plants with egg masses 0 DAA	84.0	78.0

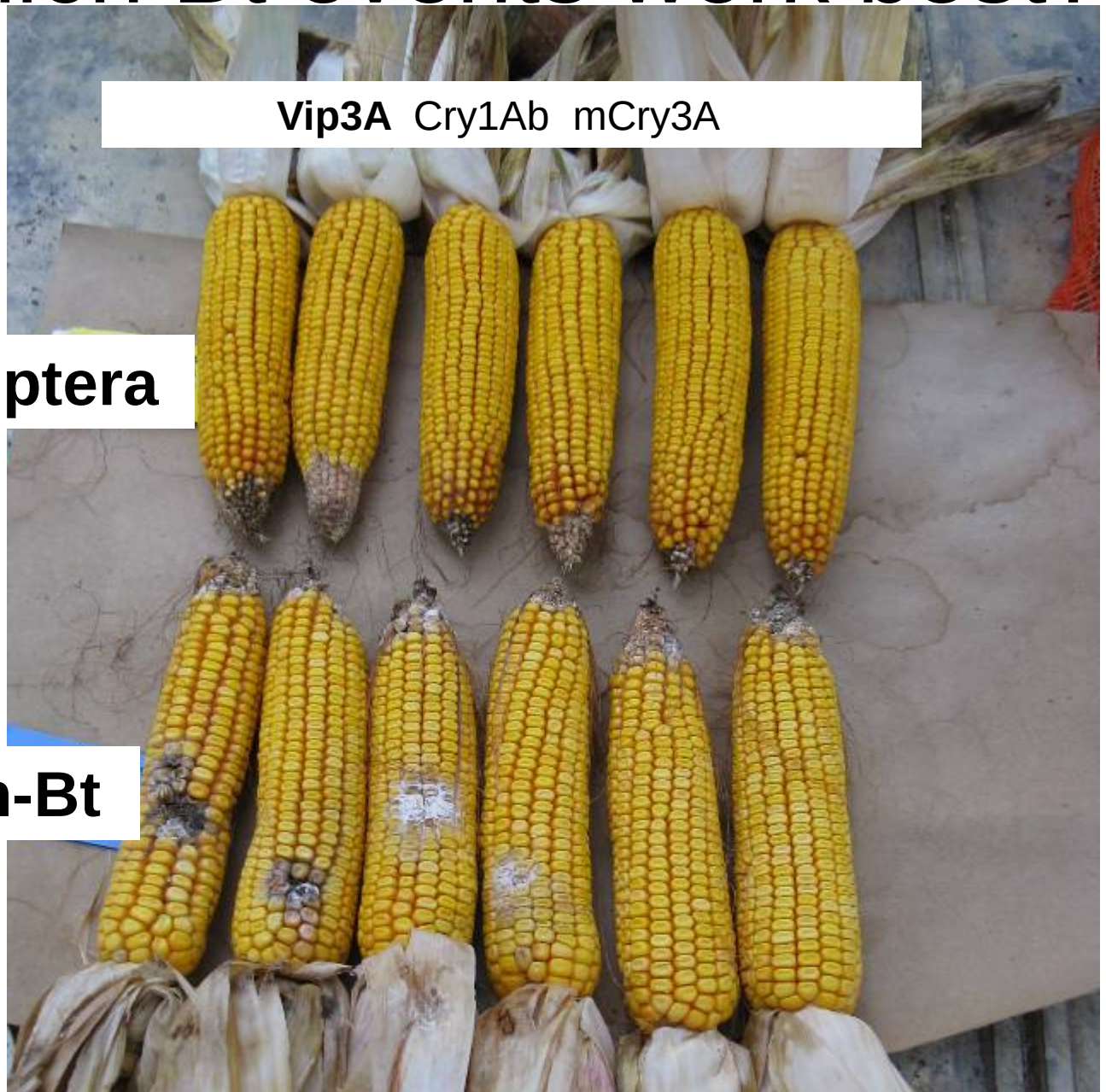

Bothwell
Clachan
Bothwell
Clachan
Mean Plot Yield (bu/ac)
Mean area of WBC damage per ear (cm²)
250
200
150
100
50
0
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Untreated
Proline 480 SC (prothioconazole) (416.0 ml/ha)
Matador 120 EC (λ-cyhalothrin) (83.0 mL/ha)
Matador 120 EC (λ-cyhalothrin) (187.0 mL/ha)
Matador 120 EC (83.0 mL/ha) + Proline 480 SC (416 mL/ha)
Voliam Express (λ-cyhalothrin + chlorantraniliprole) (500.0 mL/ha)
Decis 5 EC (deltamethrin) (300.0 mL/ha)
Coragen 200 SC (chlorantraniliprole) (250.0 mL/ha)
Treatment

Grain quality concerns including

DON (deoxynivalenol)

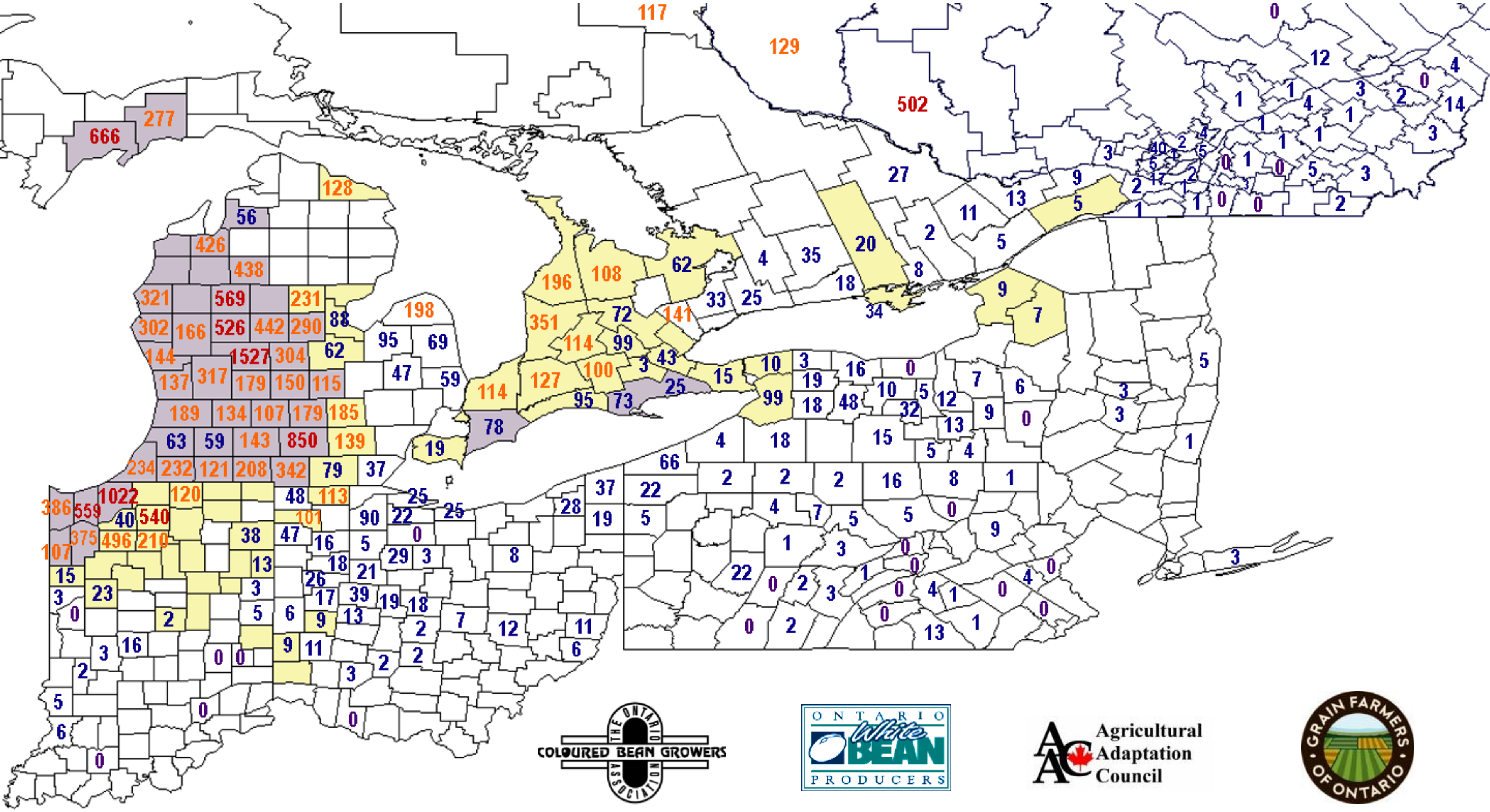
Which Bt events work best?

Which Bt events work best?



EXTENSION OUTCOMES

Average Number of Moths per Trap by County for the Great Lakes Region in 2010



THE ONTARIO COLOURED BEAN GROWERS ASSOCIATION

ONTARIO White BEAN PRODUCERS

Agricultural Adaptation Council

GRAIN FARMERS OF ONTARIO

Ontario

MICHIGAN STATE UNIVERSITY

UNIVERSITY of GUELPH RIDGETOWN CAMPUS

Agriculture, Pêcheries et Alimentation Québec

PURDUE UNIVERSITY

THE OHIO STATE UNIVERSITY OARDC

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Ontario Western Bean Cutworm Scouting Video

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BauteBUGBlog.com

← Western Bean Cutworm and Scouting in Dry Beans

Crop Residue Value →

Scout Corn Ears for Western Bean Cutworm

September 1, 2011 • Written by Tracey Baute

Some corn fields may be at risk of extended WBC feeding this fall, particularly those that were late planted or are situated where egg laying occurred over a wider window. This year in particular, we are seeing a wide range of larval sizes because of the extended egg laying period that took place across much of the province. Fields that are maturing quickly may be less at risk, as the larvae will be dropping down to the ground to overwinter as the ears dry down in these fields.

Though we know there were hot spots this year, including Bothwell to Strathroy and south of Tillsonburg, we encourage all corn producers to be scouting for ear damage over the next month. Scouting will identify additional areas that had decent WBC pressure and are at risk of higher overwintering populations and

Next Steps

- Analysis of 2012 field season
- Greenhouse and lab bioassay work continues this winter
- Develop BMP for corn and dry beans
- Investigate IRM strategy for transgenic corn

Acknowledgements

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Jennifer Bruggeman, Todd Phibbs, Steve Willis, the numerous summer students and WBC trap participants across Ontario

Questions?

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