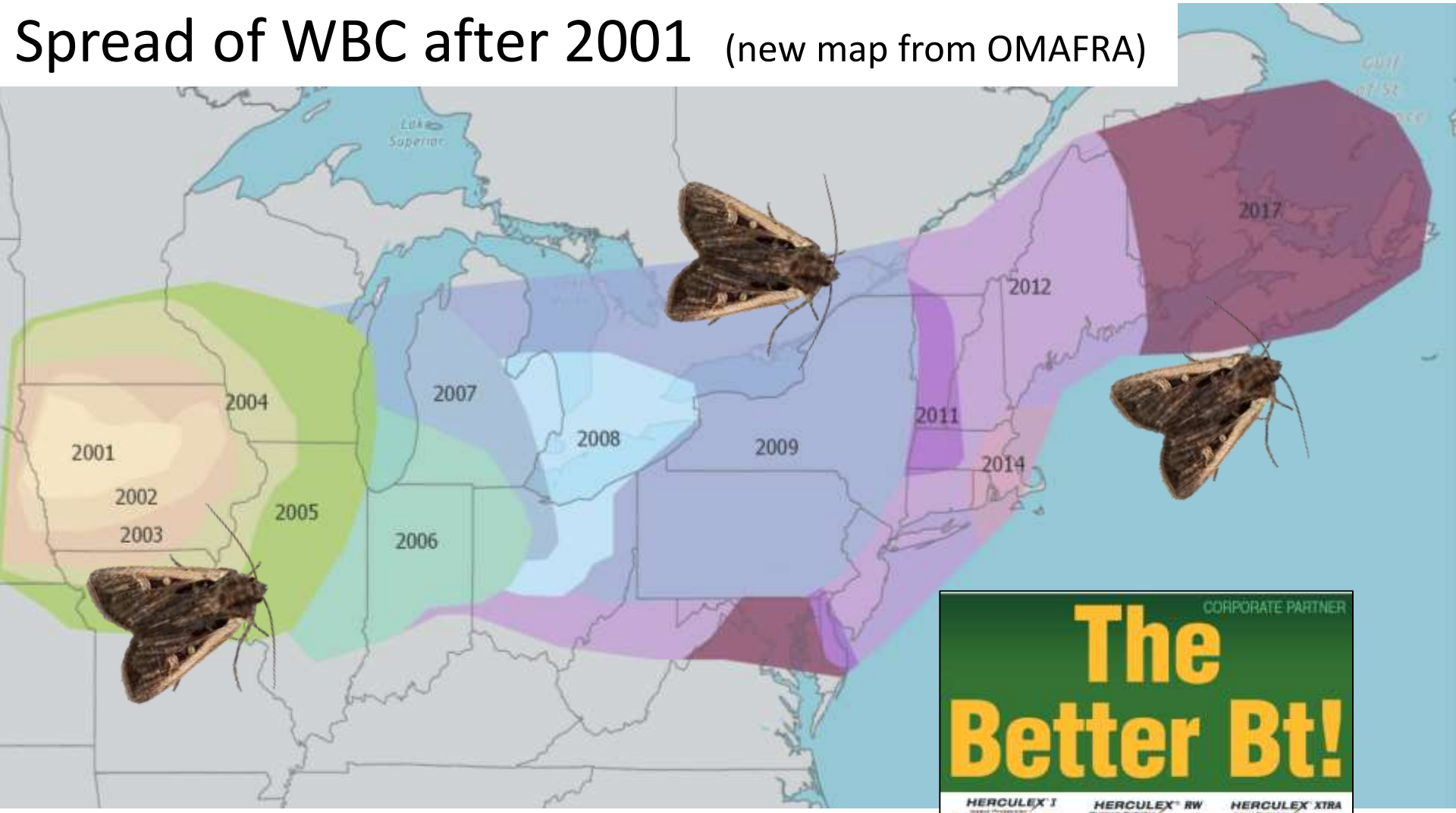
# Updated perspective on western bean cutworm

Chris DiFonzo
Field Crops Entomologist
Michigan State University

This slide set contains information & pictures from:
Chris DiFonzo & Bruce Mackellar, Michigan State University
John Obermeyer, Purdue  Andy Michel, OSU  Tracey Baute, OMAFRA
Jocelyn Smith & Art Schaafsma, University of Guelph, Ridgetown

WBC was considered a ‘secondary’ pest in its native western range

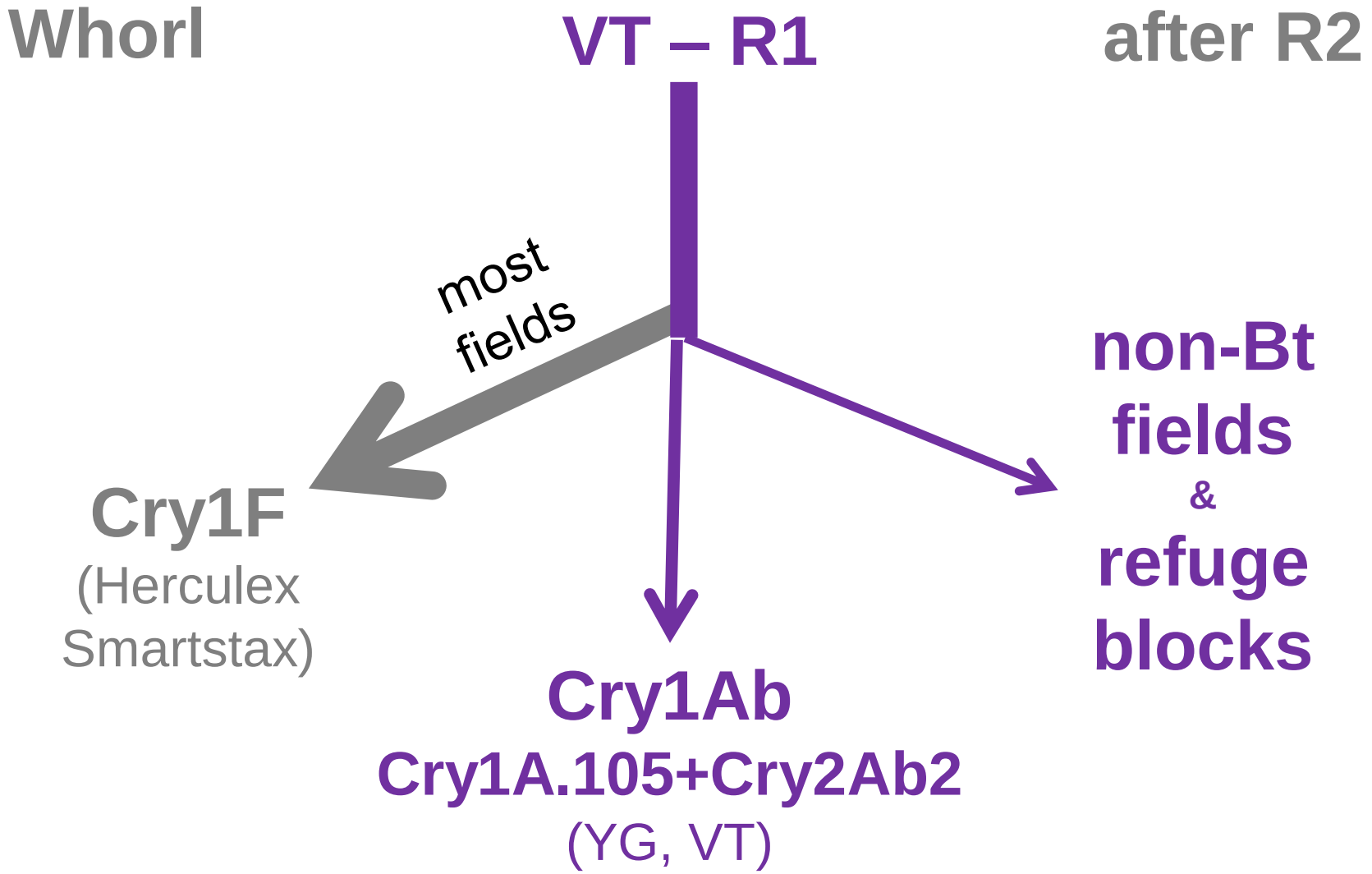
# Spread of WBC after 2001 (new map from OMAFRA)



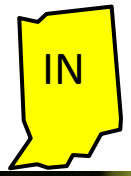

2004: WBC control first appeared on the Cry1F label

# 2011 - Priorities for WBC Scouting

*Stage of corn*



# August 2016 - Cry1 failures across the Great Lakes region


John Obermeyer
IPM Specialist
Purdue University

Dr. Andy Michel,
Ohio State.
"Just plain ugly"

# Why did this happen?

#1 Cry1F was never excellent against WBC

#2 Use of Refuge in the Bag?

| **MSU Trial 2010 season** | **Bt** | **Refuge** | **% ears damaged** |
|---|---|---|---|
| non-Bt | none | none | 82% |
| Genuity SmartStax | Cry1A.105 Cry2Ab2 **Cry1F** | 5% block | **34%** |
| Genuity SmartStax RIB Complete | Cry1A.105 Cry2Ab2 **Cry1F** | 5% in bag (RIB) | **74%** |

Use of **blue corn** to show cross-pollination of non-Bt refuge ears

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** no real refuge

** even worse, a lot of low dose exposure of larvae in the ear

*(P. Porter, Texas A&M)*


low efficacy + low dose exposure leads to many resistant survivors

few unexposed moths to mate with survivors & dilute resistance

# Why are we managing WBC anyway?

**Western Bean Cutworm Survival and the Development of Economic Injury Levels and Economic Thresholds in Field Corn**

S. PAULA-MORAES,[1] T. E. HUNT,[2] B. J. WRIGHT,[3] G. L. HEIN,[4] AND E. E. BLANKENSHIP[5]

J. Econ. Entomol. 106(3): 1274–1285 (2013); DOI: http://dx.doi.org/10.1603/EC12430

ABSTRACT Western bean cutworm, *Striacosta albicosta* (Smith) (Lepidoptera: Noctuidae), is a native pest of dry beans (*Phaseolus vulgaris* L.) and corn (*Zea mays* L.). Historically, the western bean cutworm was distributed in the western United States, but since 1999 eastward expansion has been observed. In corn, economic impact is caused by larval ear feeding. Information on western bean cutworm biology, ecology, and economic impact is relatively limited, and the development of economic injury levels (EILs) and economic thresholds (ETs) is required for more effective management. Studies during 2008–2011, across three ecoregions of Nebraska, sought to characterize western bean cutworm survival and development of EILs and ETs. Calculations of EILs and ETs incorporated the dynamics of corn price, management cost, and pest survival. The results from the current study demonstrated low larval survival of this species (1.51–12.82%). The mean yield loss from one western bean cutworm larva per plant was 945.52 kg/ha (15.08 bu/acre), based on 74,100 plants per ha. Economic thresholds are expressed as a percentage of plants with at least one egg mass. This study is the first study that explicitly incorporates variable management costs and crop values into western bean cutworm EIL calculations, and larval survival into ET calculations.

## Yield Loss

A recent Nebraska estimate:
1 larva/plant = 15 bu /ac loss


Ontario trial in 2013

- Michigan 2016: Estimated loss based on kernel count: ~ 9 bu/ac

from anonymous agribusiness contact in S Mich.


But huge infestations & actual yield loss are not all that common

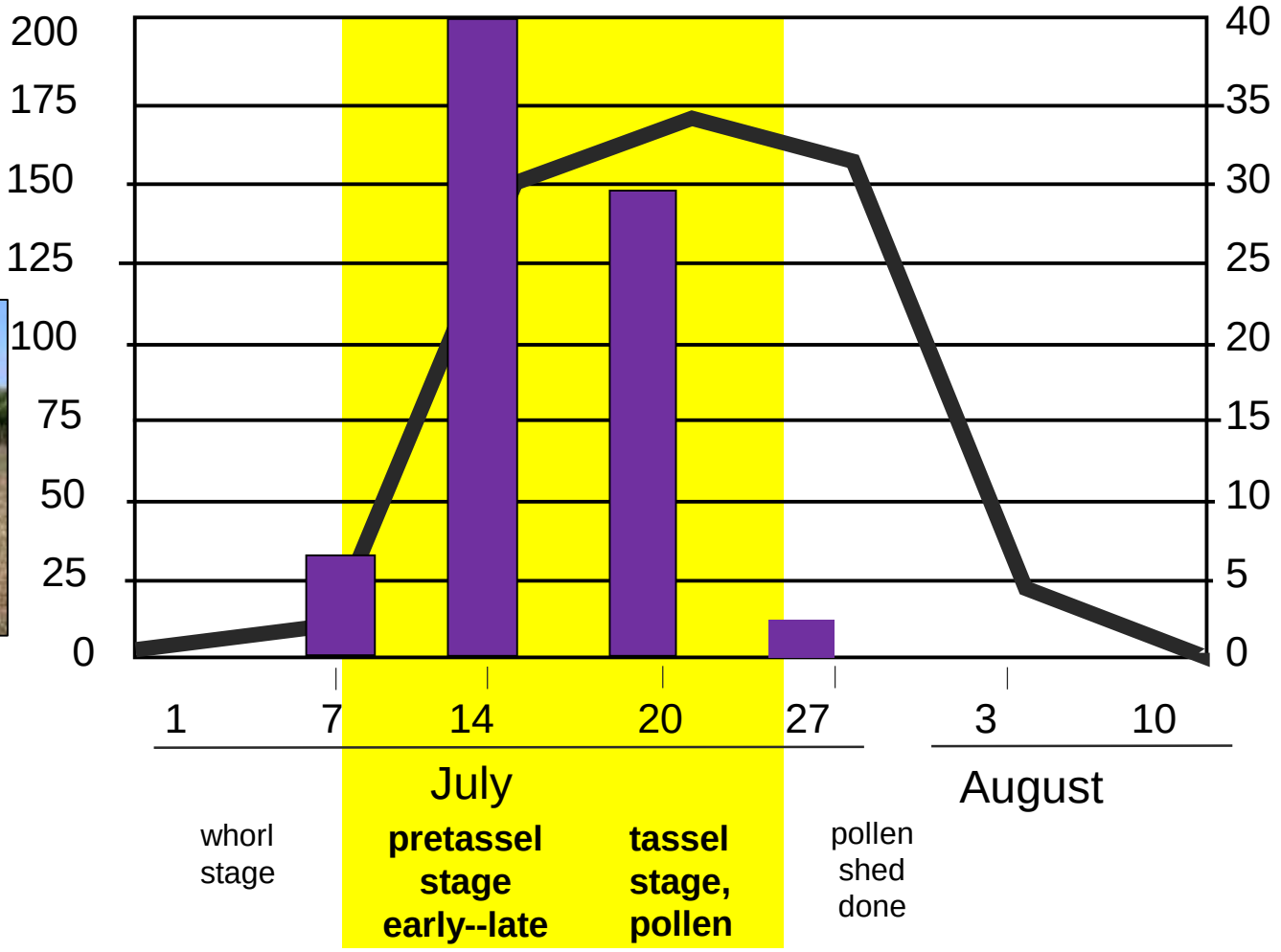
**Reduced Quality:**

a bigger issue in the Great Lakes region

- tip & side feeding opens husk for other insects
- moisture
- bird damage
- moldy, damaged kernels
- wounds for infection by pathogens like Gib
- increased risk of mycotoxin

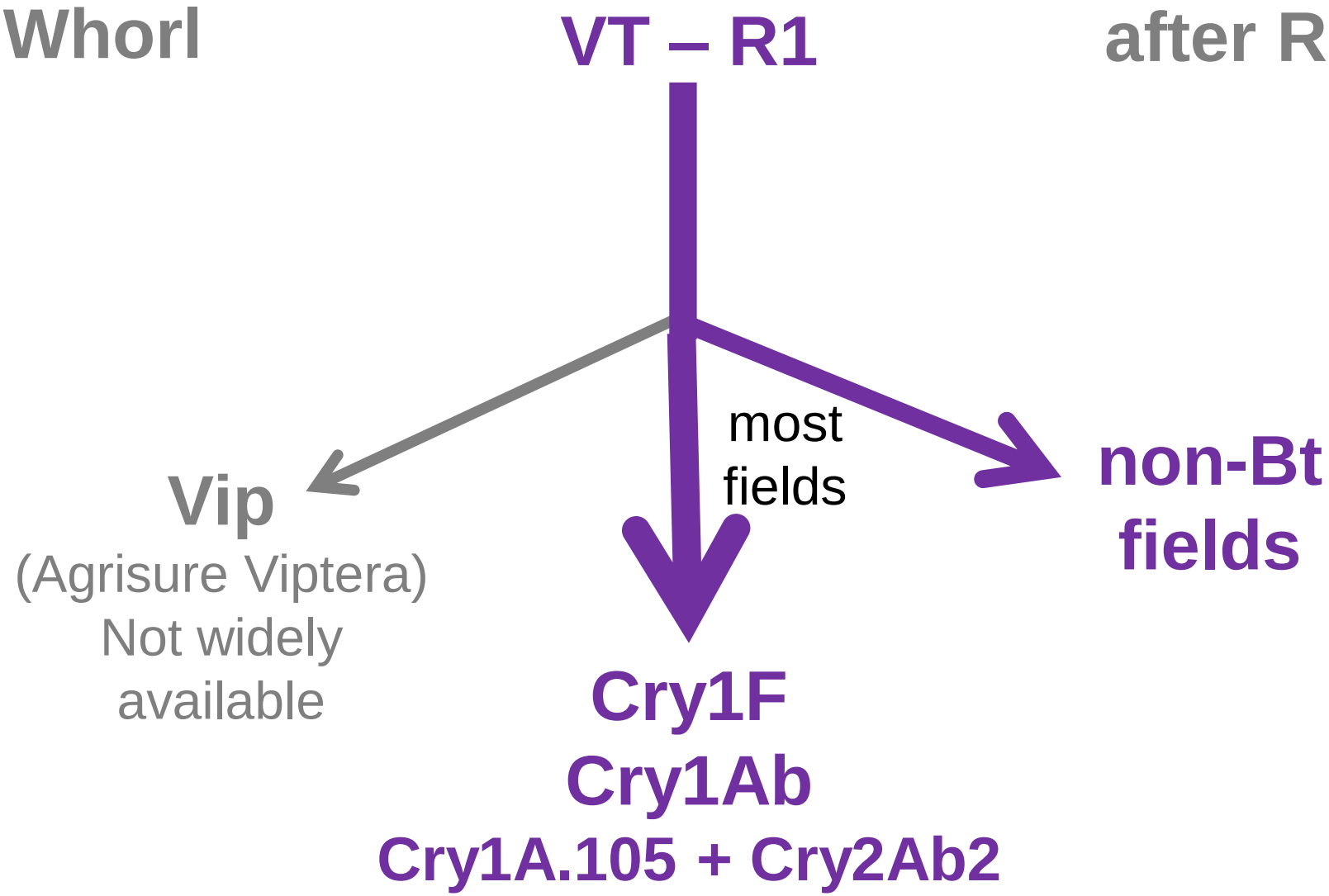
# What can you do?

- Trap moths to detect flight
- Then target pretassel & tasseling fields for scouting




# Revised Priorities for WBC Scouting

*Stage of corn*



- Learn to ID and scout for egg masses




** TIP: mock-up infestation for training using Wite Out

** TIP: Place the sun behind the upper canopy & always use a face shield

# **CUMULATIVE** Threshold - Mich & Ontario

scout pretassel fields for egg masses

= >5%

***spray***

<5%

***scout again***

*6-7 days*

<5%

add % infestation

= >5%

***spray***

# Spraying insecticides

- single well-timed application
- ground preferred vs aircraft (coverage)

<u>pyrethroids</u>
Brigade
Warrior

<u>indoxacarb</u>
Steward

<u>diamide</u>
Prevathon
(chlorantraniliprole)

- pyrethroid resistance is a real possibility
- use threshold & rotate chemistry

# Spray timing can be tricky

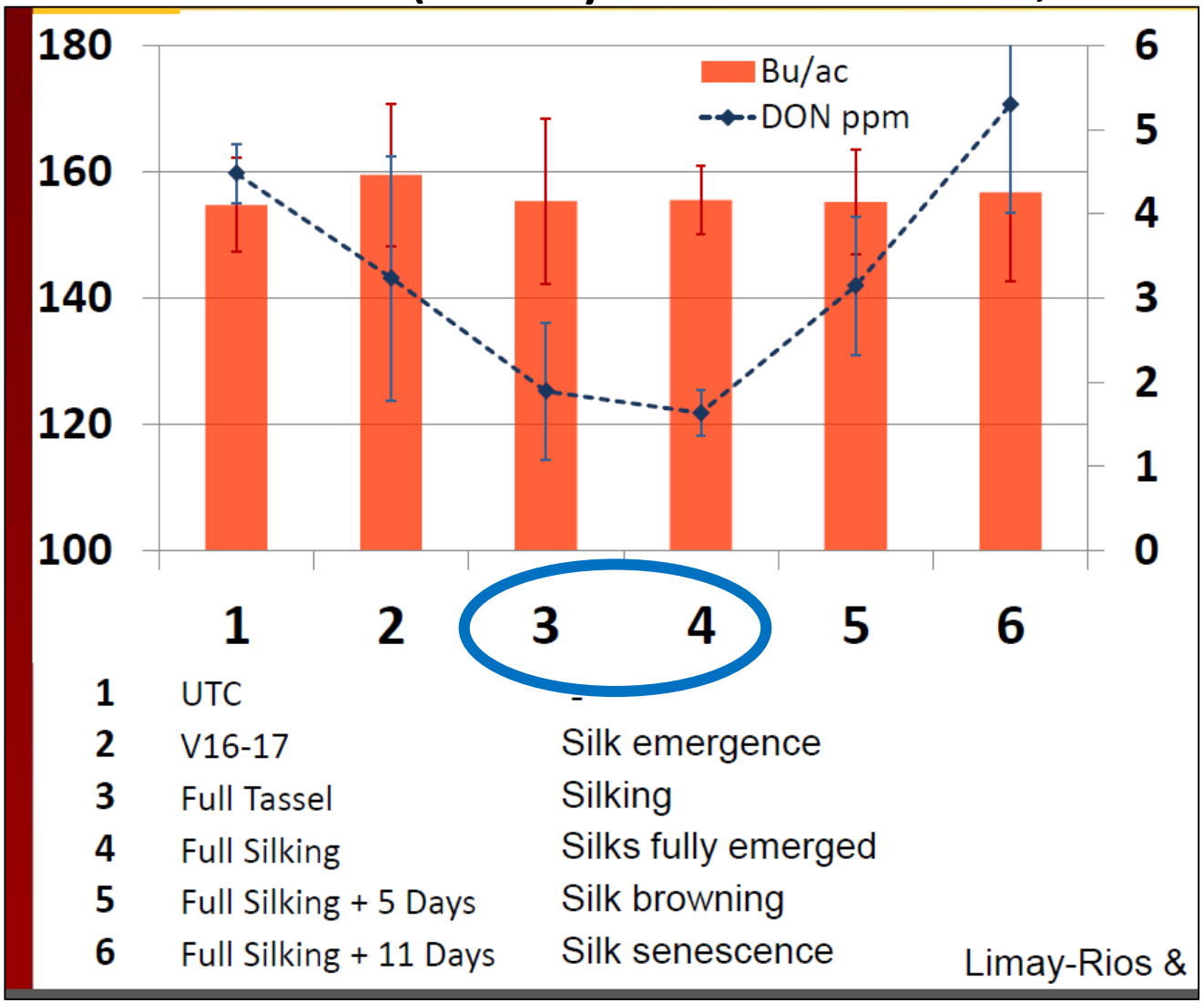
insecticide alone

- time sprays to control larvae about to hatch or newly-hatched (moving on plant)
- rule of thumb:  95% of plants tasseled
- once in the ear, larvae are protected from insecticide (altho they move plant-to-plant)

insecticide & fungicide tank mix

- optimize the fungicide component

# Proline (prothioconazole) timing trial in Ontario (Limay & Schaafsma, 2013)

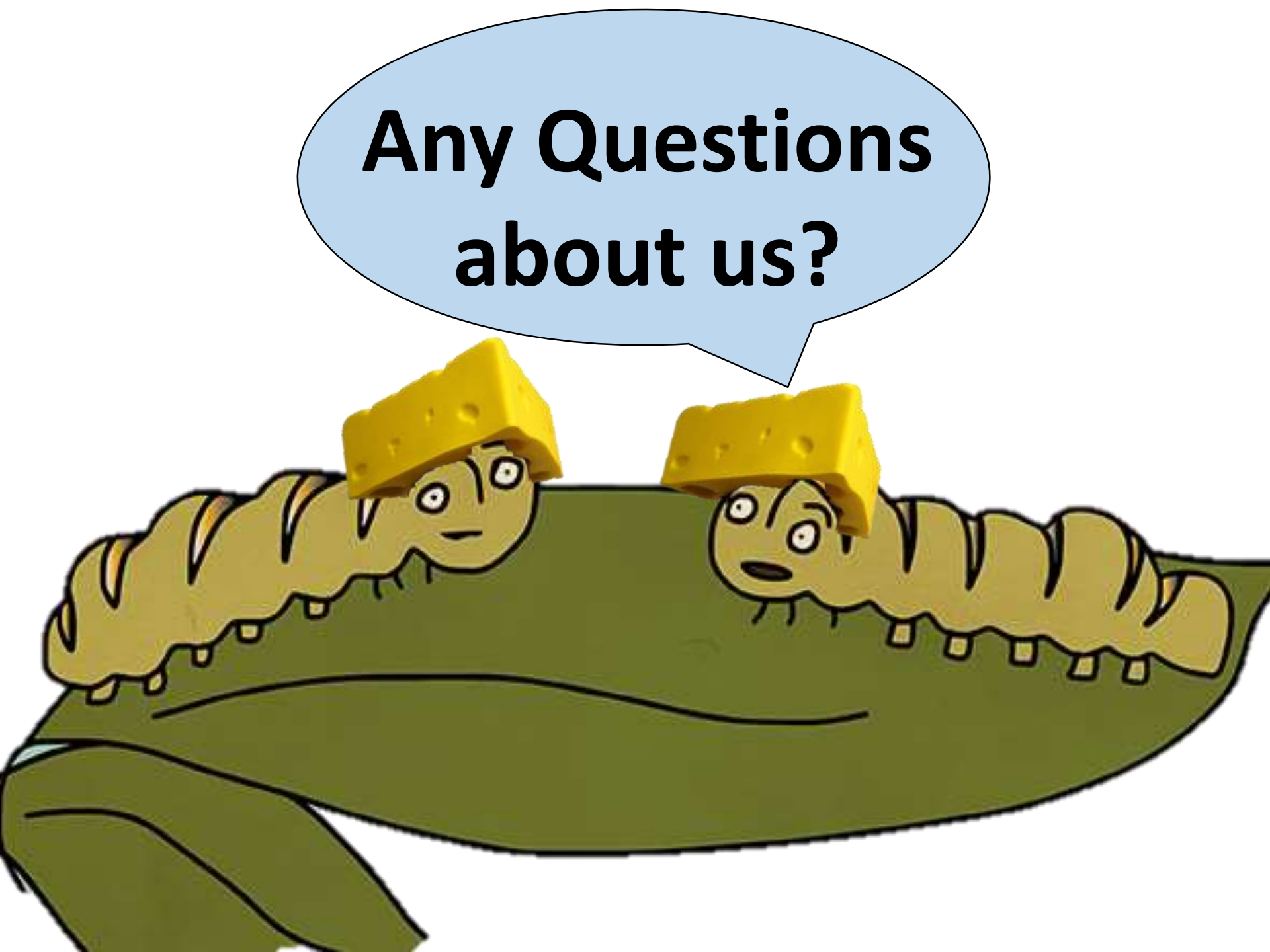



No yield difference (bars), but DON levels decreased with proper timing *(full silk)*

# WBC control also requires the management of **Unrealistic Expectations**

- requires scouting, maybe twice
- egg laying can extend for several weeks
- spraying tall corn is a pain
- % control will never be 100%
- WBC damage, yield, & DON are hard to correlate

***Nothing will ever match the amazing control of corn borer by Bt corn***


Any Questions about us?