THE OHIO STATE UNIVERSITY

COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

Insect Trends from 2016: Western Bean Cutworm and Stink Bugs

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Trends We Saw in 2016

- Western bean cutworm damage in corn
- Frequent failure of Bt to control it
- Stink bug damage in soybean -- discovered *after* harvest

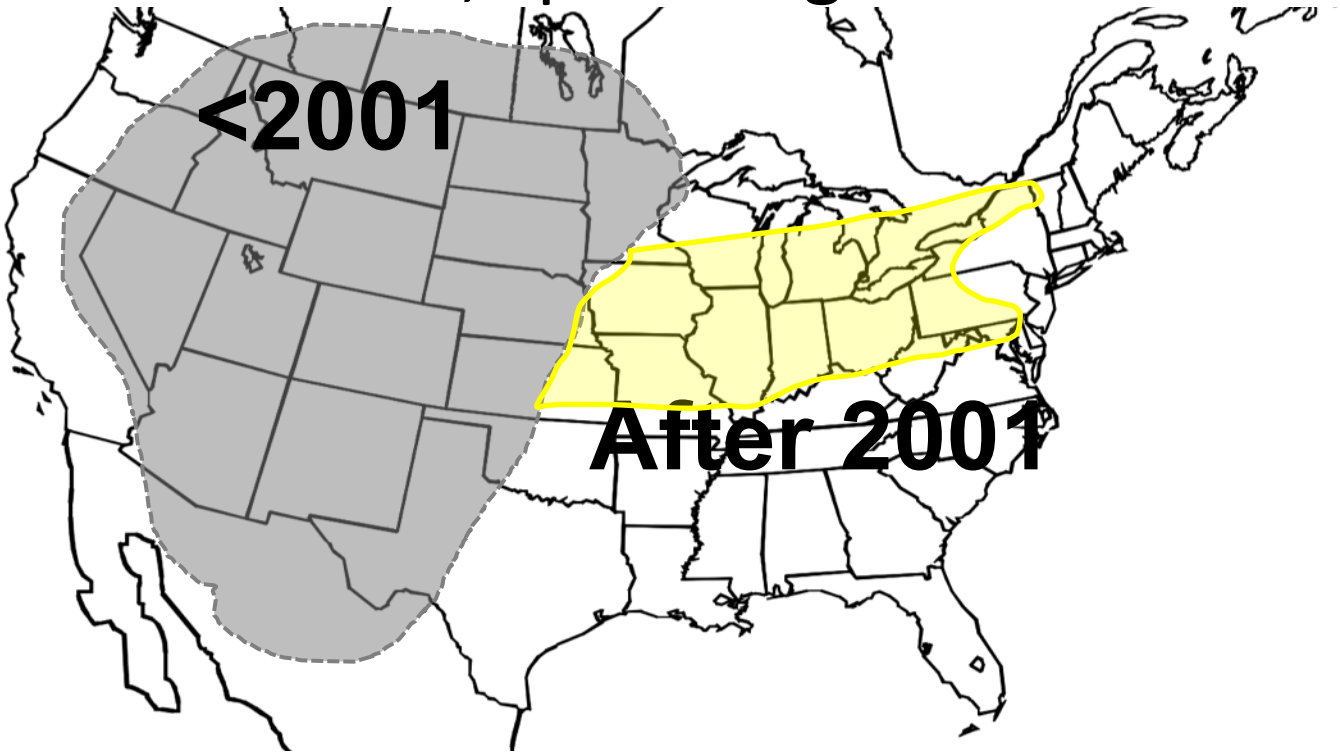
Western Bean Cutworm: Why Care?

- This pest has been spreading in the eastern corn belt
- Noteworthy 2016 damage in Ohio, Michigan, Indiana, New York, Ontario
- Bt hybrids with Cry1F are no longer providing adequate control in many places

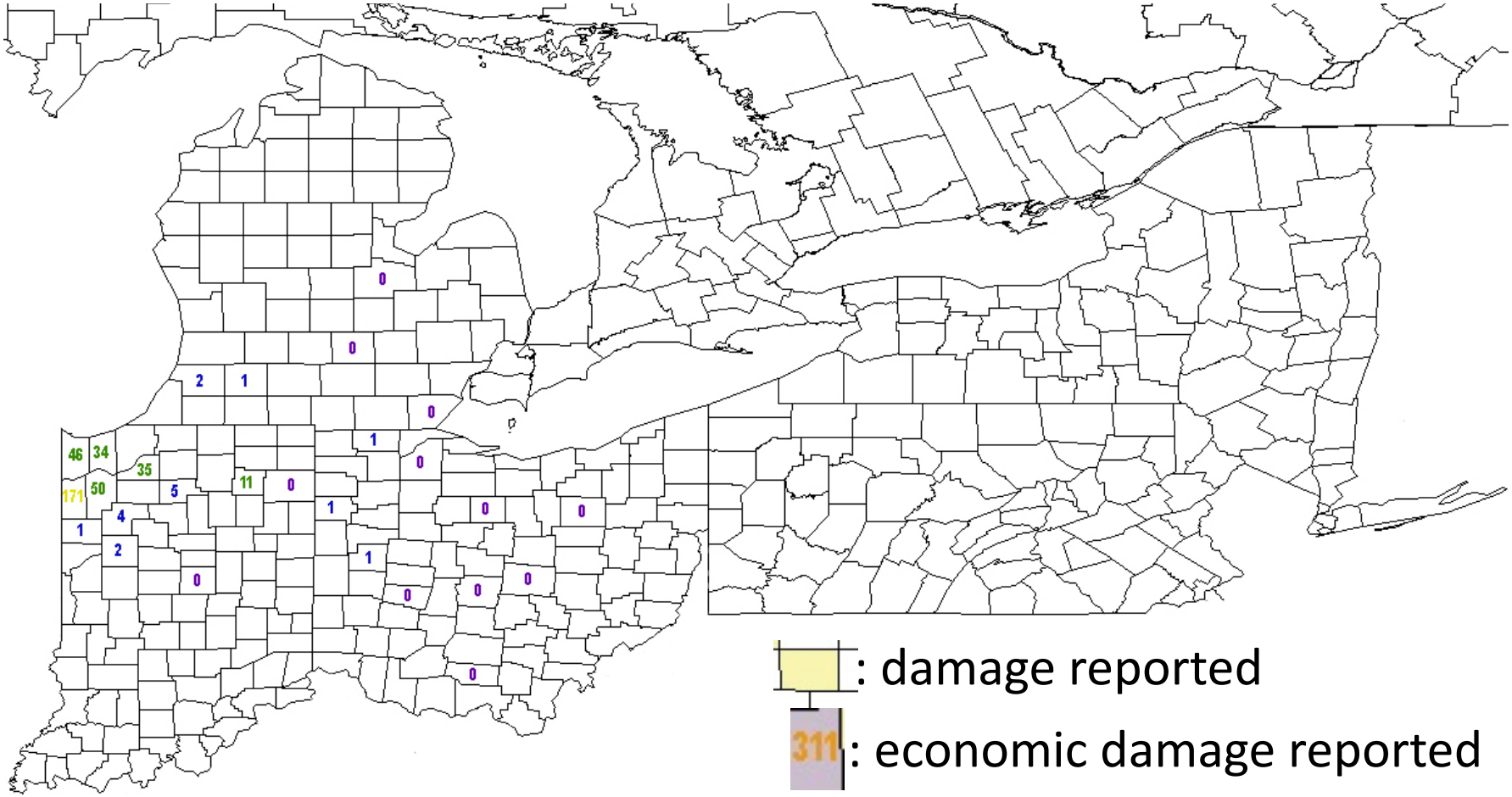
Photo credit: Chris Di Fonzo, MI State

Western Bean Cutworm

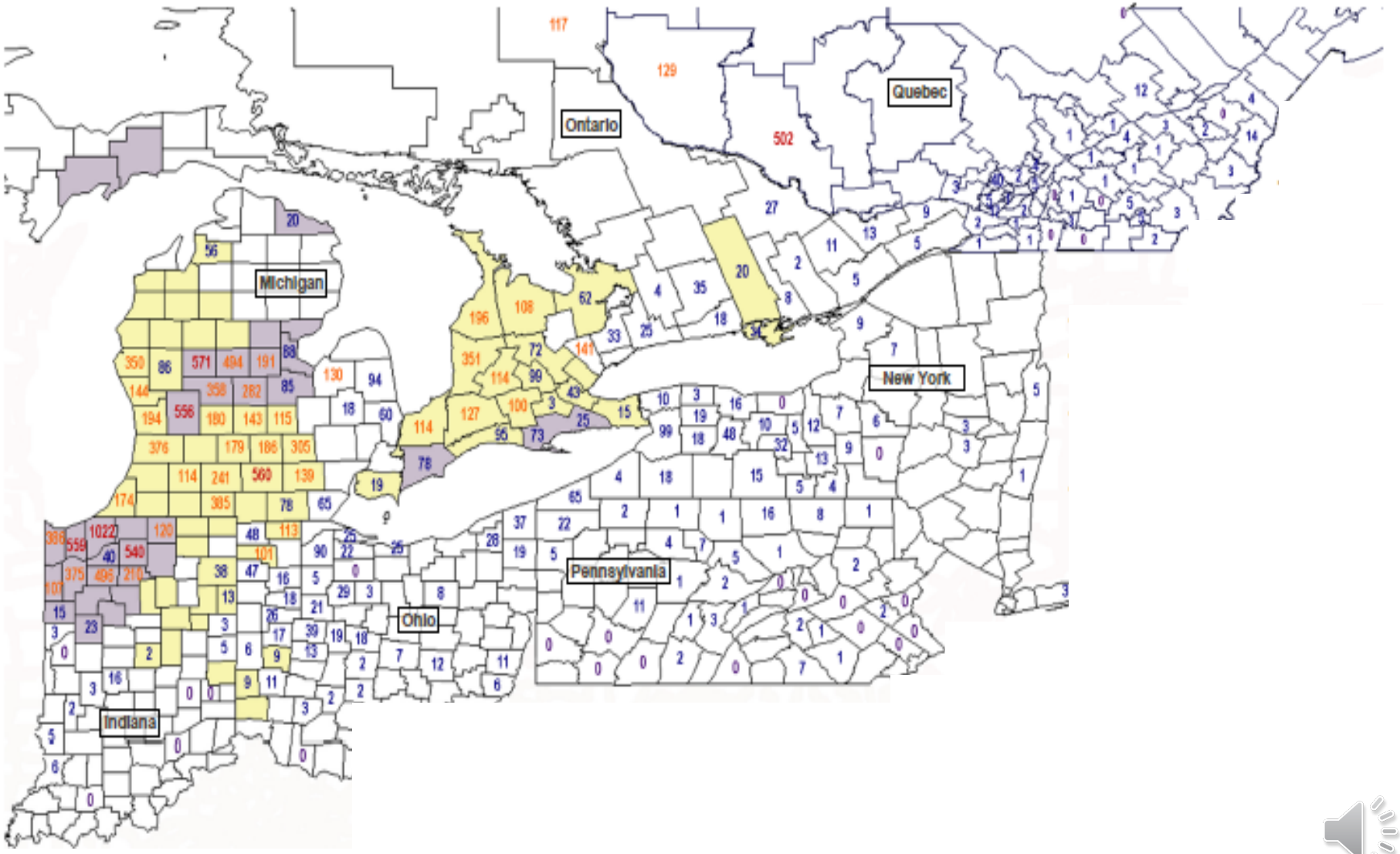
- Native species first found in Western states
- Feeds on dry beans and corn
- Found in IA 2001, spreading ever since



Western Bean Cutworm 2006

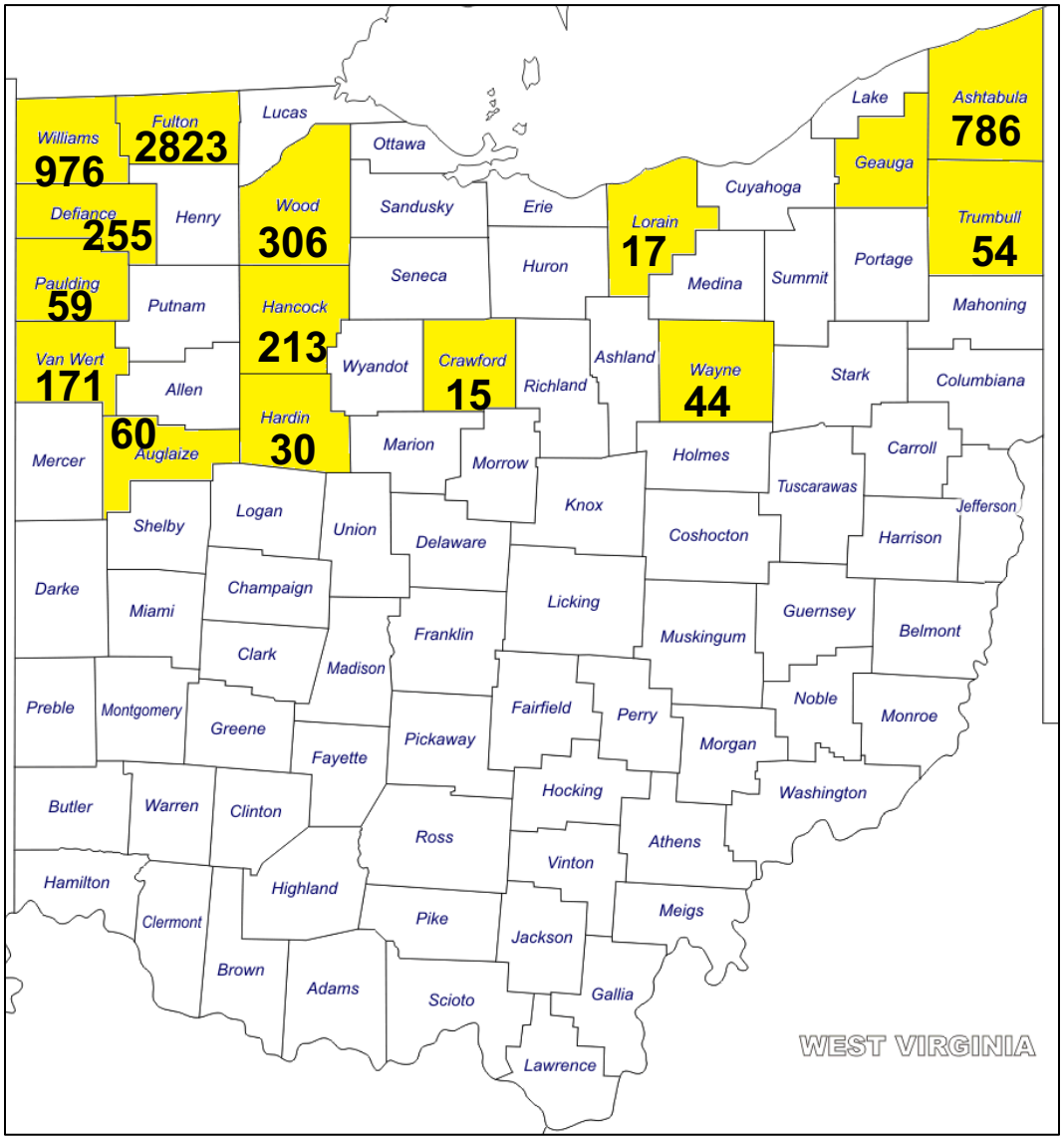


Western Bean Cutworm, 2010



Map credit: Tracey Baute, OMAFRA

WBC Trapping in Ohio, 2016

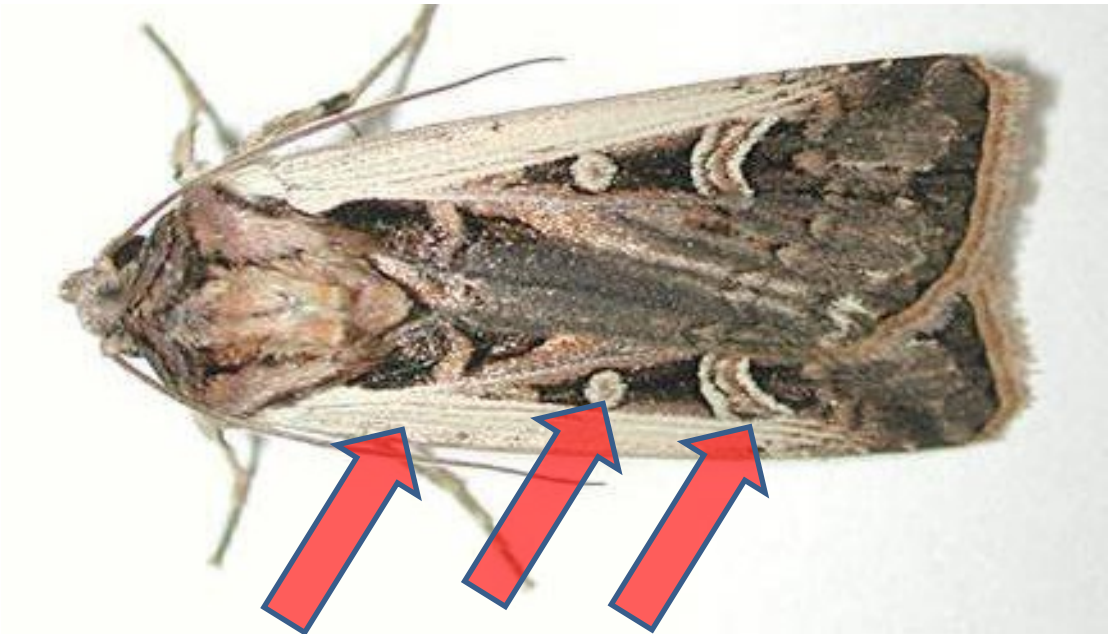


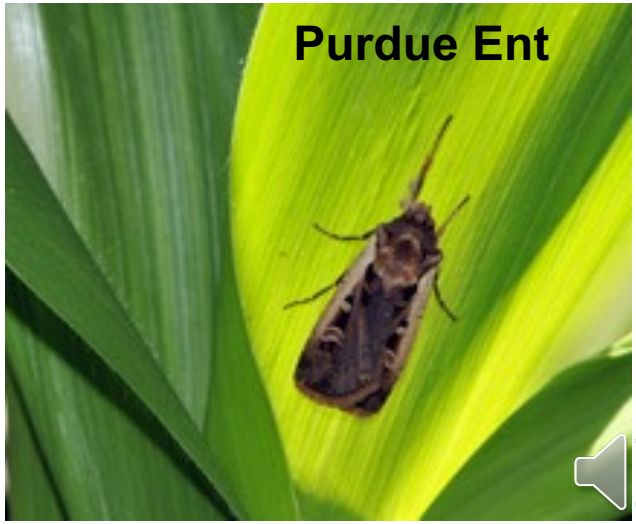
= participated in WBC Trapping

= total WBC trapped, all summer

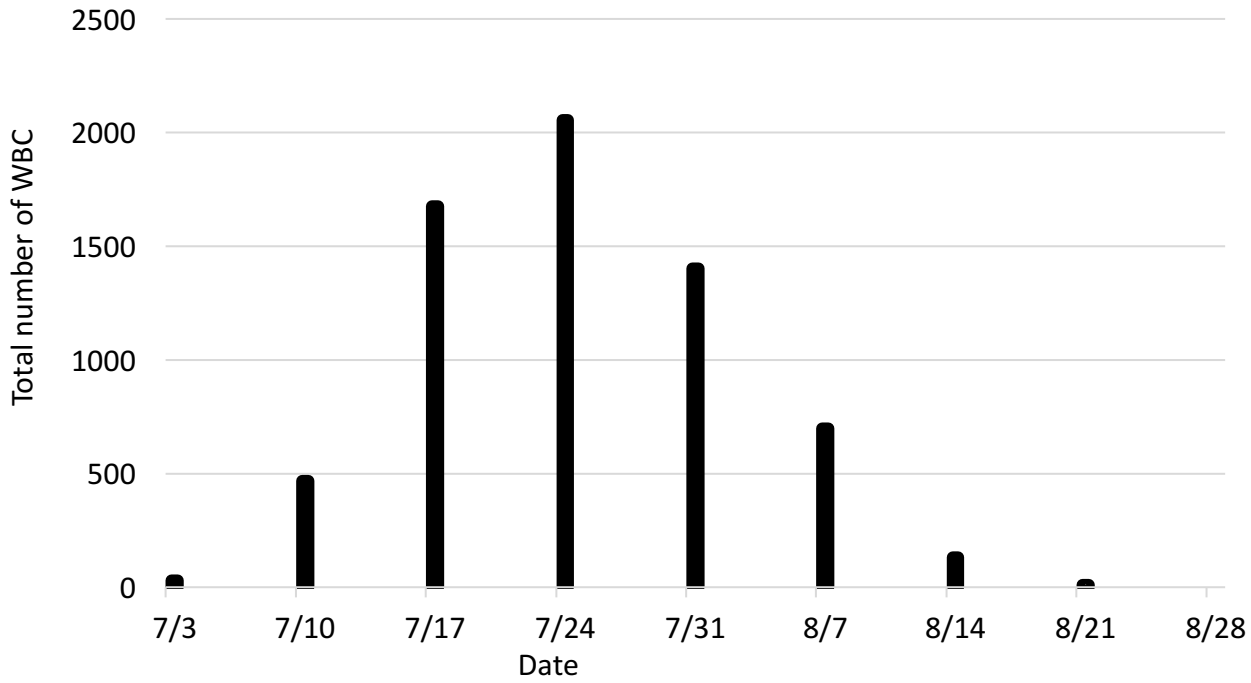
WBC Biology-Adults

- 1 generation per year
- Adults emerge in late June/early July
  - Fly at night, rest during day
- Fly until late August/Sept





WBC Trap Catch in Ohio, 2016

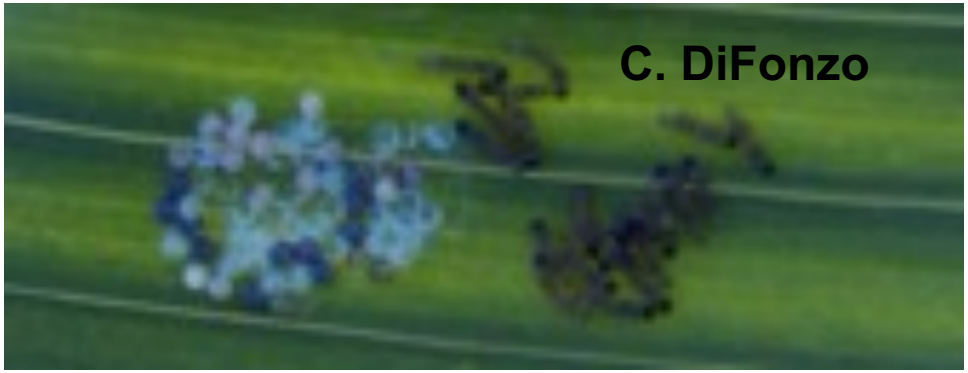


WBC Biology--Eggs

- Eggs laid from July until August
- Clumps of 25-100; 5-7 days to hatch
- Start white, then tan/pink, then purple
- Hatch within 24-48 hrs when purple

WBC Biology--Larvae

- 5-6 larval stages
- 1st: Very small, spotty, black heads
- Hatch, eat shells, move to pollen and tassel



First Instars

WBC Biology--Larvae

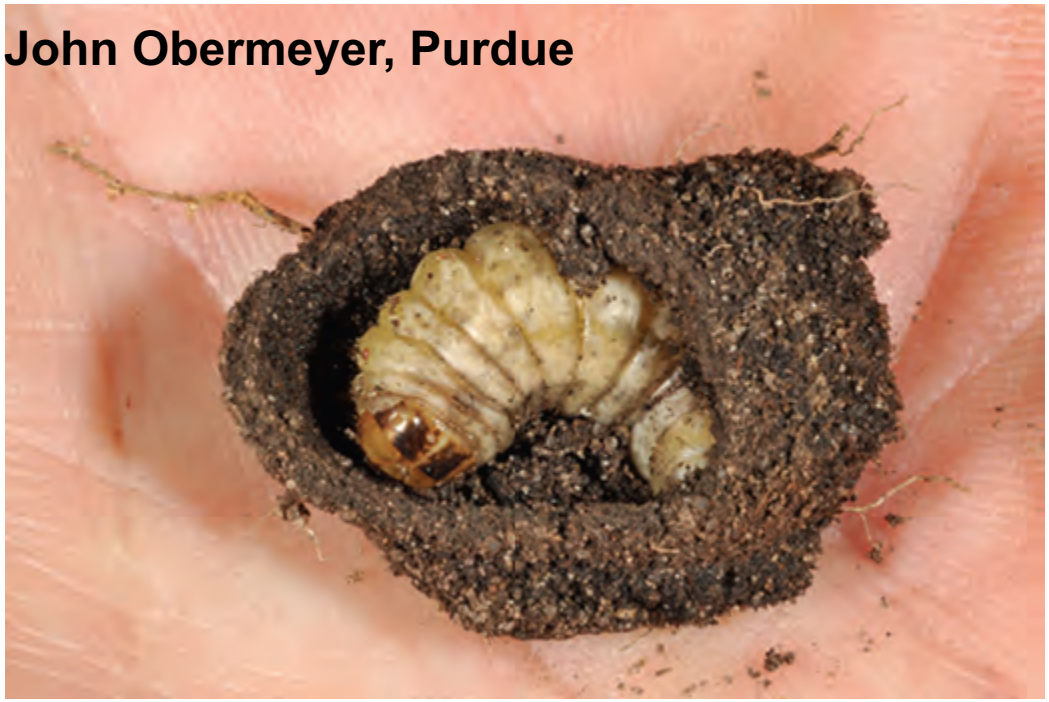
- Later stages move to ear
- ID by 2 brown stripes behind head
- Chew on silk and enter ear through tip or side

- Brown stripes not always apparent in earlier stages

John Obermeyer, Purdue

WBC--Pupae

- Larvae last until late Sept
- Fall out and form earthen chamber deep in soil, pre-pupa stage
- Pupate in May, start emerging as adults in June



WBC--Damage

- Most damage occurs on ear
  - Some leaf feeding, but unimportant
- Tip and the middle
- Multiple larvae can be found

WBC--Damage

- Gouged-out kernels
- "White Scraping"

WBC-Damage

- Prone to molds of different types – reduces quality

Management Options

- Bt hybrids with the Cry1F protein (e.g., Herculex I and XTRA, SmartStax brands, and others)
  - Has been the main Bt option for WBC
  - No longer provides adequate control in some places
  - Ohio, Michigan, Indiana, New York, and Ontario have all had problems with Cry1F recently

Test strips show that these ears were Cry1F, not refuge

Management Options

- Bt hybrids with Vip3A protein (e.g., Agrisure Viptera)
  - Appears to provide adequate control of WBC
  - Not widely available in our area

Management Options

- Pesticide application (many chemicals available, e.g., pyrethroids like Warrior)
- Timing is very important
  - Must hit the window between egg hatch and when larvae move into whorls or ears (protected from product)
- Because timing is important, scouting is important

WBC Scouting: Two-pronged approach

1) Trapping to know when moth flight is high
   - Adult moths flying → egg laying time
   - Lets you know when to start field-scouting and when adults are peaking
   - OSU Extension runs a trapping network and reports the results weekly
   - Build-your-own trap
2) Field scouting for eggs and clues on when hatch will occur

Scouting

- Pheromone traps (use lure)
  - Store-bought traps
  - DIY milk jug traps with bought lure
  - Hang near edge of field
  - Check at least weekly

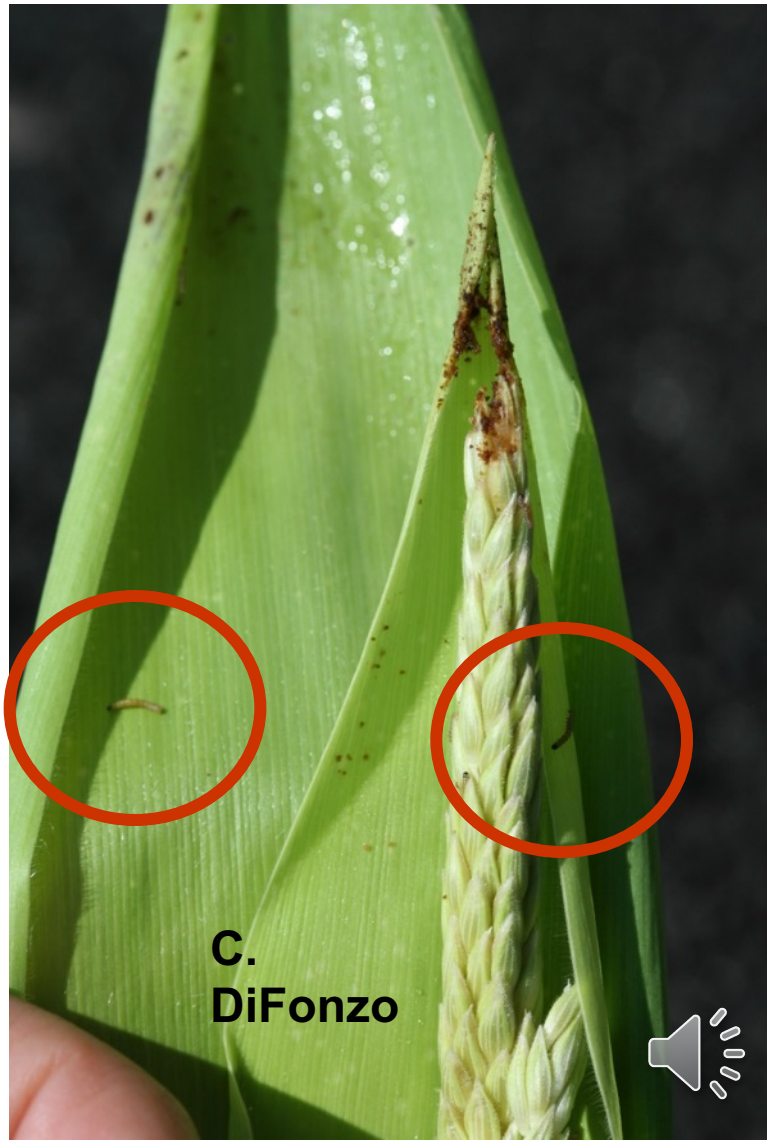
Egg Scouting

- When >1 adults are caught/night—scout!
- Focus on pre-tassel corn
  - Females preference
- Eggs are laid on uppermost 2-3 leaves
- In vertical position

- **Where's the Egg Mass?**
- Use shadow method

Economic Thresholds

- Inspect 10 plants in 10 locations
  - Across rows, too
  - Check pre-tassel corn, replant areas
- If ≥5%-8% have egg mass, treatment necessary
  - Simple pyrethroid, spinosad
  - Many chemicals available
- Spray after egg hatch, but before larvae can enter ear
  - Watch for eggs to turn purple (they will hatch in 24-48 hours)
  - Use products with good residuals



Stink bugs in soybean

- Many species; vary with geography

Redbanded Stink Bug

Brown Marmorated Stink Bug

Brown Stink Bug

Red-shouldered Stink Bug

Green Stink Bug

Photo credits: Mo Way, Texas A&M (Redbanded); Amy Raudenbush, Ohio State University (all others)

What happened in 2016?

- No more than average reports/questions about stink bugs during the growing season
- More than average reports of damage after harvest
- Suggests scouting efforts should have been greater!

Stink bugs in soybean

- Similar damage among species
- Piercing/sucking mouthparts puncture pod wall
- Feed directly on seed
- Results in shriveled or aborted seeds

Photo credits: Lyle Buss, University of Florida (mouthparts); Amy Raudenbush, Ohio State University (all others)

- Heavy feeding can cause delayed plant maturity
- Populations often start at field edges and can move inwards

Photo credit: Andy Michel, Ohio State University

Stink bug scouting and management

- Scout from R1 through early R6
- Focus scouting on field edges until stink bugs are confirmed present – then scout the whole field
- Sweeping works for most species
  - Take 10, 10-sweep samples around field
  - Count all species and juveniles/adults together
  - Threshold
    - average 4 bugs per 10-sweep set for grain
    - average 2 bugs per 10-sweep set for seed or food-grade
- Brown marmorated stink bugs are harder to sweep (they are skittish)
  - Rely on visual scans while walking, 2 per row-foot

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Thank You

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