Insect Identification, Seasonal Occurrence and Management

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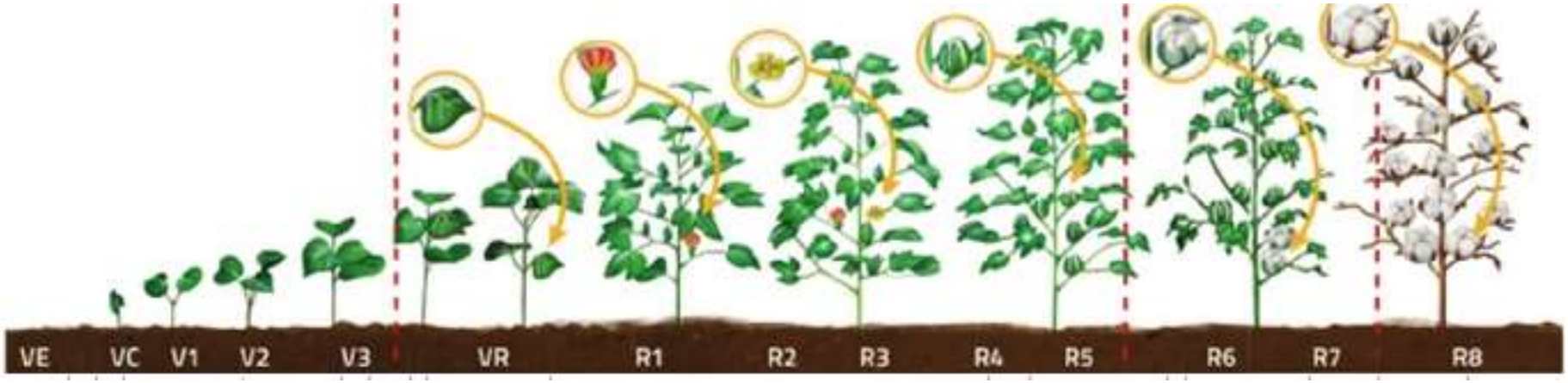
Cotton

Cotton growth stages and associated pests












Cotton growth stages and associated pests

Emergence to seedling establishment

From seedling emergence until the development of first full leaf.

WATCH FOR

Cotton aphid | Flower thrips | Black cutworm | Twospotted spider mites | Snails

Leaf area and canopy development

The formation of individual true leaves and branches in a spiral around the main stem.

WATCH FOR

Cotton aphid | Soybean looper | Southern armyworm | Yellowstriped armyworm | Garden armyworm | Cabbage looper | Beet armyworm | Whiteflies | Plant bugs | Snails

First square to first bloom

Squares begin to grow on the main stem and branches.

WATCH FOR

Cotton bollworm | Tobacco budworm | Fall armyworm | Flower thrips | Cotton aphid | Soybean looper | Southern armyworm | Yellowstriped armyworm | Garden armyworm | Cabbage looper | Beet armyworm | Whiteflies | Stink bugs | Plant bugs | Snails

First bloom to open boll

At least one bloom is visible.

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Fiber maturity

A field should be considered mature as soon as white fibers are visible.

WATCH FOR

Cotton aphid | Whiteflies | Snails

Pest Cotton App in Florida: keep simple with identification and IPM information

COTTON PESTS IN FLORIDA APP

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Thrips

Aphids

Snails

TAMU.edu

Cotton thrips

TAMU.edu

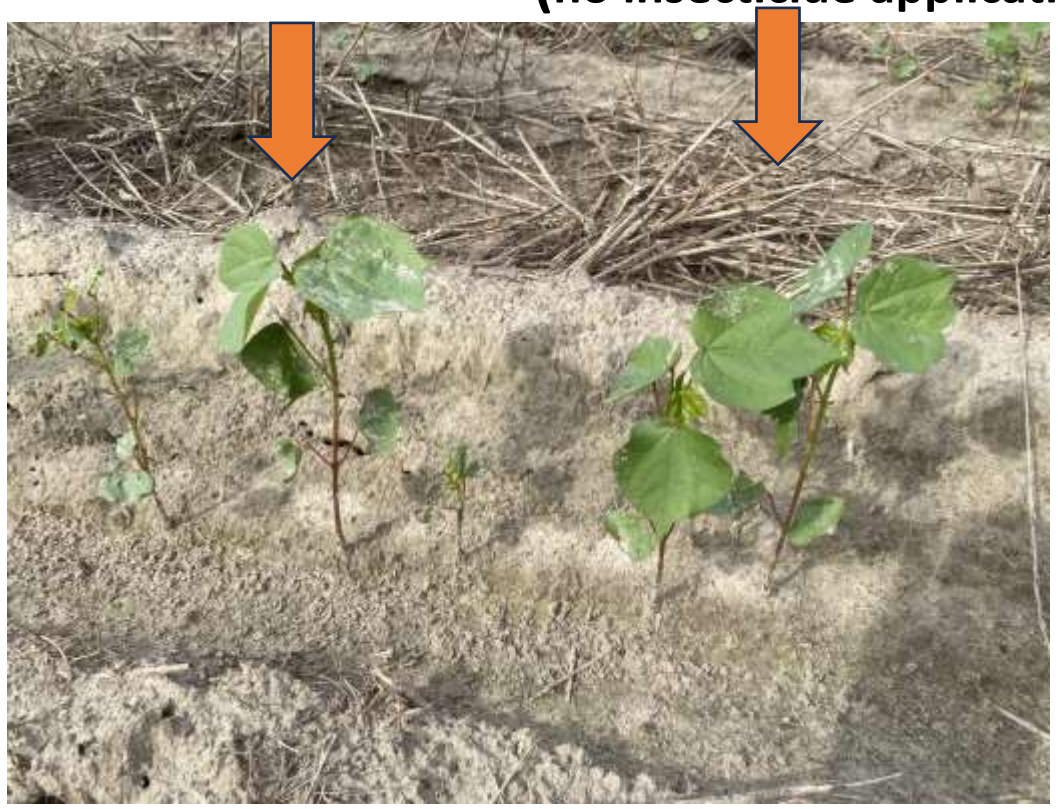
NCSU

WinField

Cotton thrips management

ThryvOn Cotton – Bt cotton

- Does not result in high levels of pest mortality
- Avoid adult thrips to feed on and deposit eggs
- Less immature thrips and less injury
- Company is providing seed with seed treatment already – imidacloprid
- No need for additional insecticide spray



Alabama Extension

Tarnished plant bug management

ThryvOn Cotton – Bt cotton

- Less adult feeding and egg deposition
- FL Panhandle – low pest density – Infestation in June
- Proper scouting and insecticide timing
- Key point – reduce immatures in early-bloom growth stage

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First square to open boll

Cotton bollworm *(Helicoverpa zea)*

Cotton bollworm

- Spines present
- Orange-tannish head capsule
- Alternating dark and light stripes

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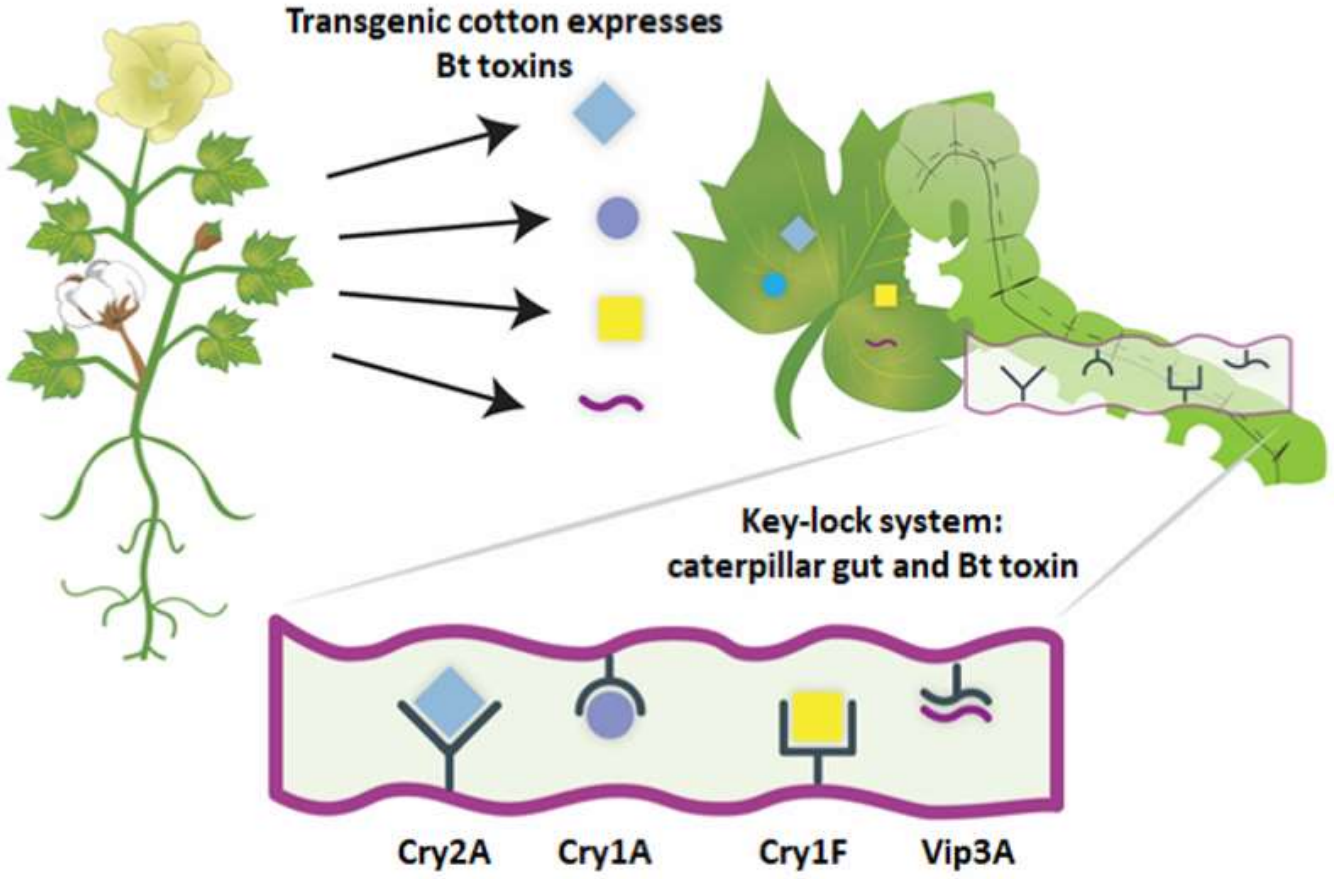
Cotton bollworm management

- Transgenic plants expressing *Bacillus thuringiensis* toxins

How does Bt cotton kill target caterpillars?



Design by S. Rodriguez

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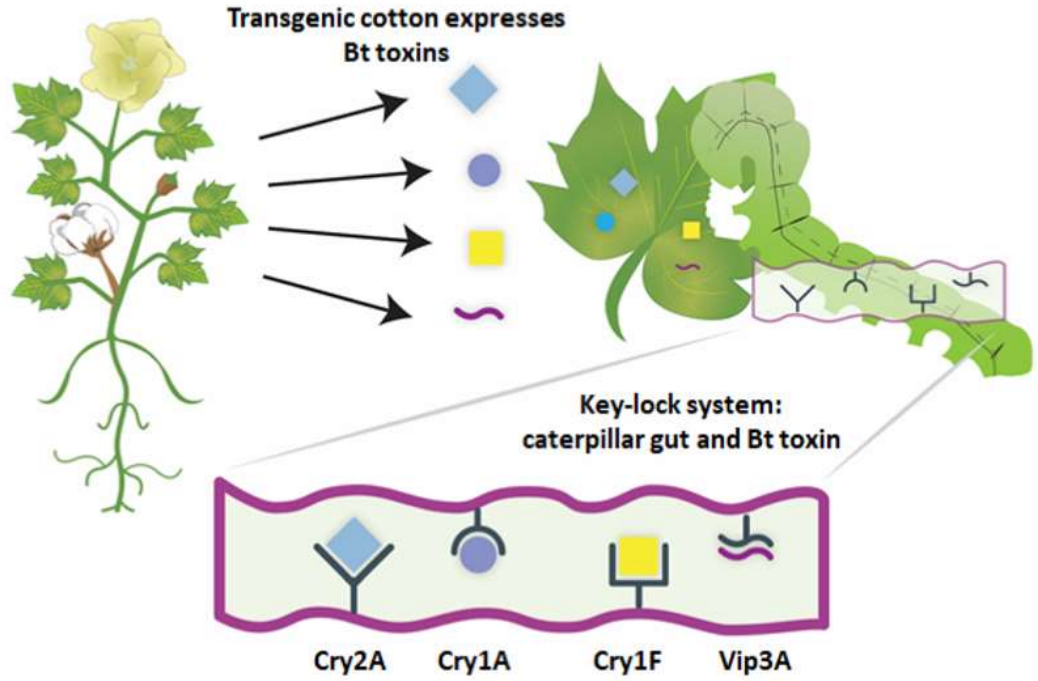
Transgenic Bt cotton

Example of cultivars	Family	BT toxin
DP 1646B2XF	Deltapine	Cry1Ac, Cry2Ab
PHY 444WRF	Phytogen	Cry1Ac, Cry1F
DP 1851B3XF	Deltapine	Cry1Ac, Cry2Ab, Vip 3Aa19
PHY480W3FE	Phytogen	Cry1Ac, Cry1F, Vip3A a19
ST 5471GLTP	Stoneville	Cry1Ab, Cry2Ae, Vip 3Aa19
ST 5610B3XF	Stoneville	Cry1Ac, Cry2Ab, Vip 3Aa19
ST 4990B3XF	Stoneville	Cry1Ac, Cry2Ab, Vip 3Aa19

Bt-cotton II

Bt-cotton III



Design by S. Rodriguez

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Cotton bollworm management

- Risk of resistance to Bt cotton
  - Escapes in Bt cotton

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Cotton bollworm management

- Monitoring fields
  - Target initial cotton infestation
  - Supplement control with insecticide

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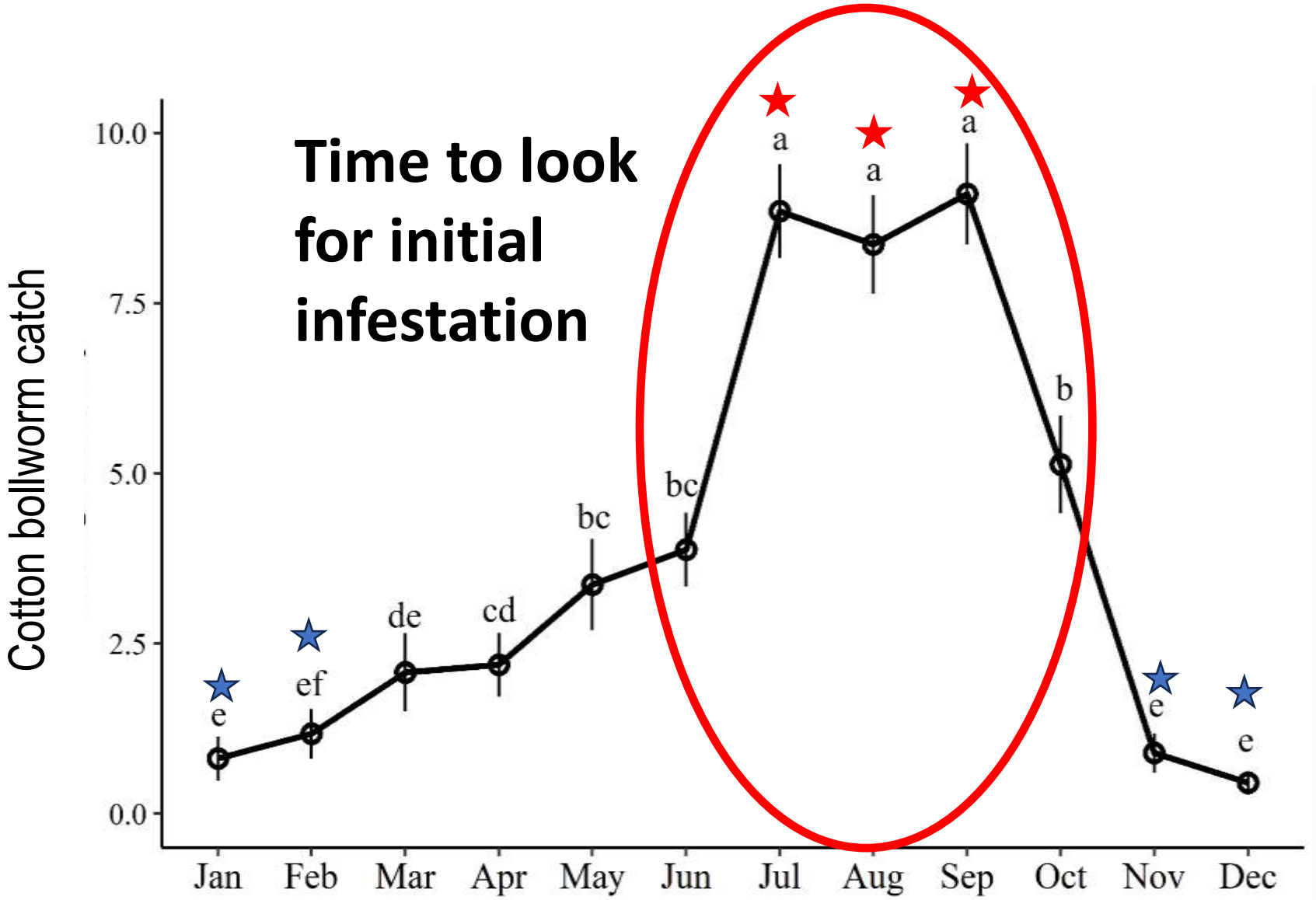
Cotton bollworm moth flight in the region



Monthly abundance of *H. zea* moths in the WFREC, Jay, FL

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Cotton bollworm management

- Risk of resistance to Bt cotton
  - Escapes Bt technology

Unexpected injury (UXI)

- 18% injury to Bt-cotton II with 3rd instars present

- 12% injury to Bt-cotton III with 3rd instars present

Contact us if you see escapes of cotton bollworm in the region

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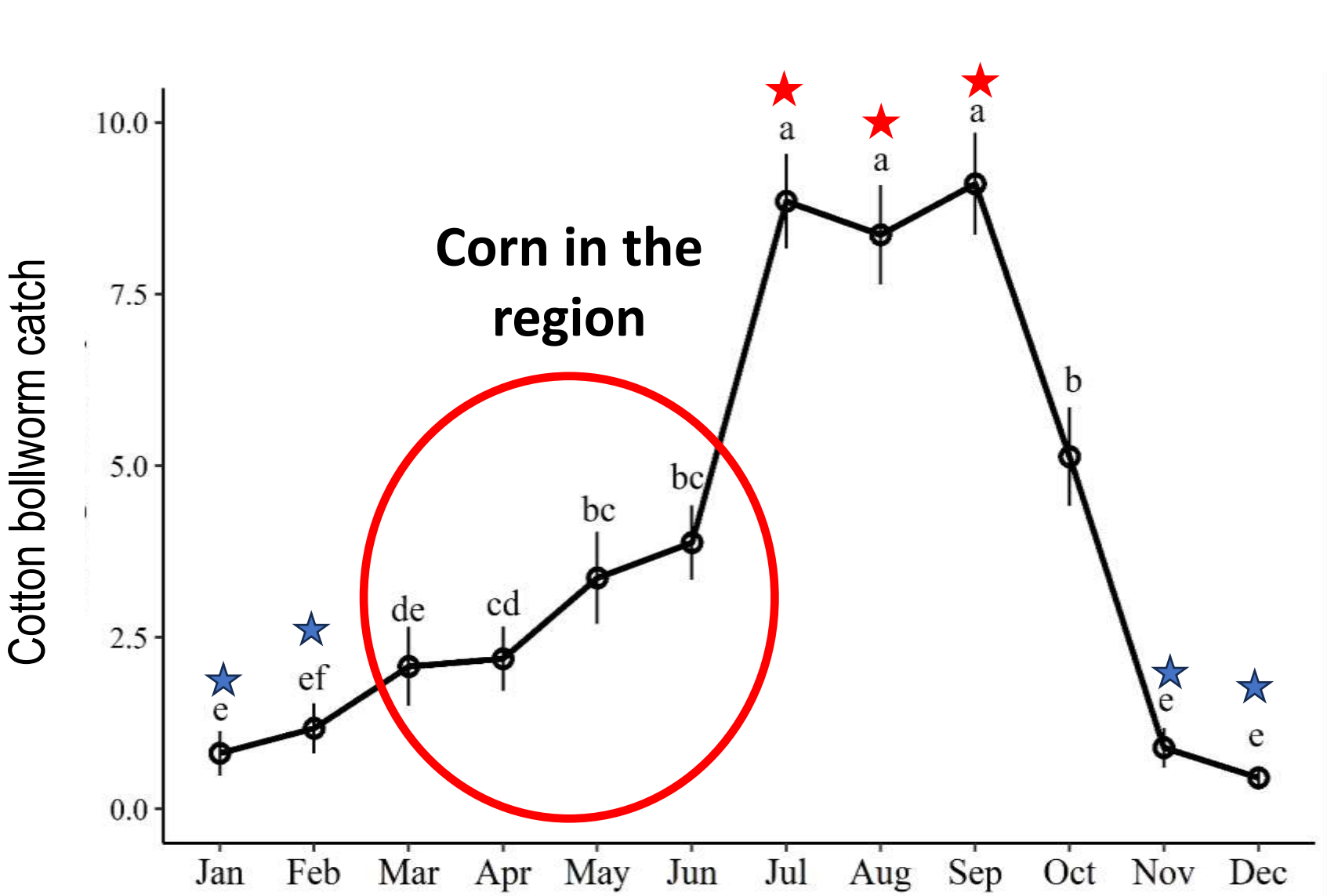
Corn

- Corn earworm

- Fall armyworm

Corn earworm moth flight in the region



Monthly abundance of *H. zea* moths in the WFREC, Jay, FL

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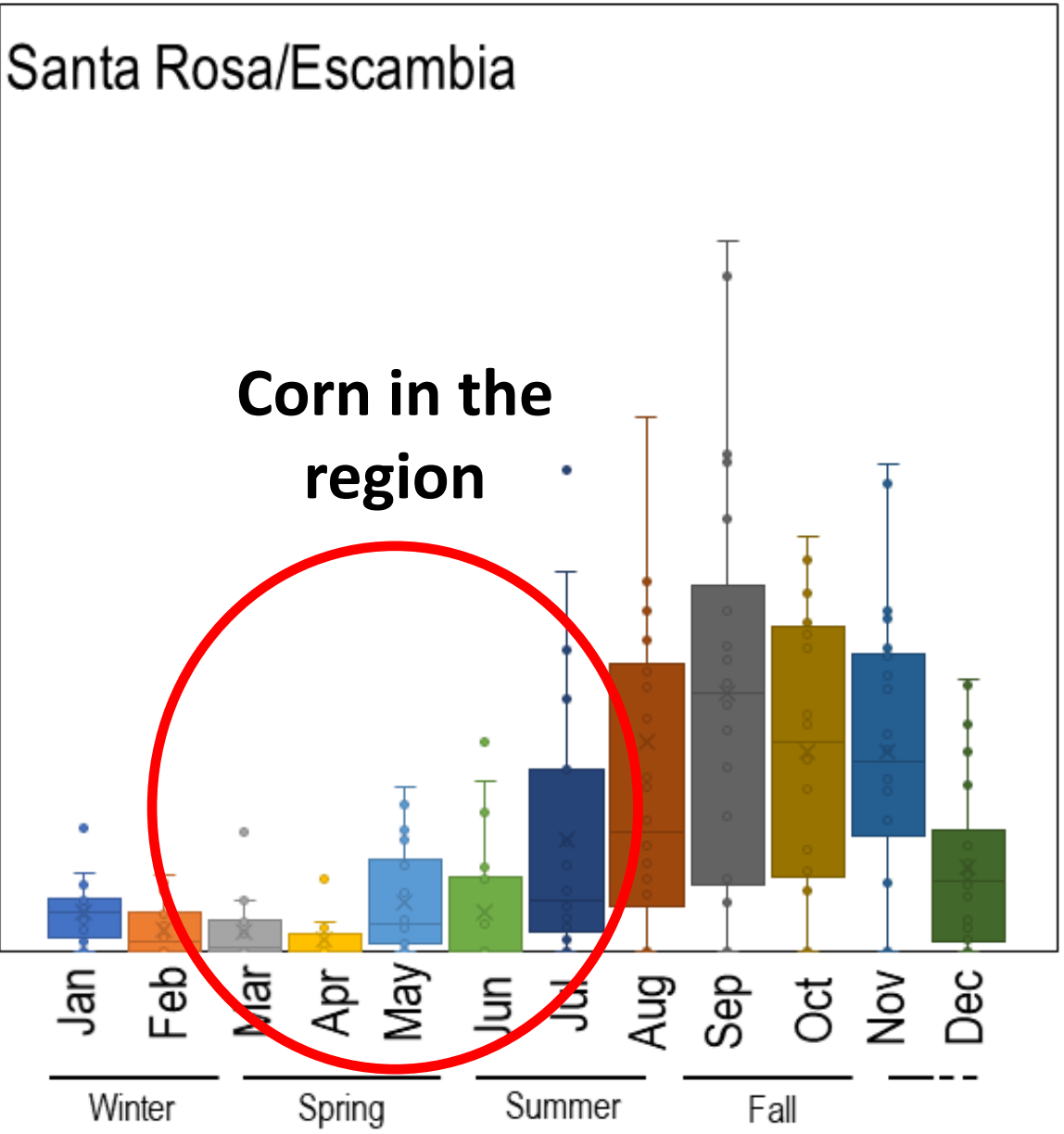
Fall armvworm moth flight in the region



Barbosa et al., *unpublished data*

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Caterpillars in soybean and peanut

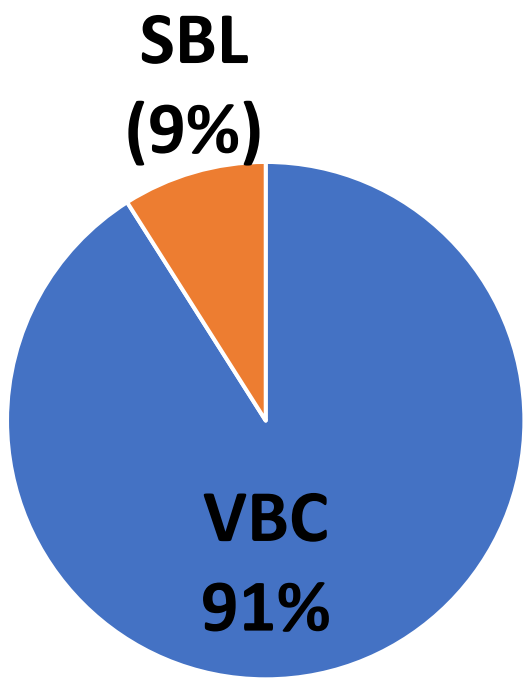
Management of caterpillars

Soybean

- Action threshold: 30% defoliation – until blooming (R1)
  15% defoliation – from blooming until filled pods (R7-R8)

High proportion of velvetbean caterpillar

Proportion of lepidopteran pests in soybean – WFREC/UF – 2019 and 2020

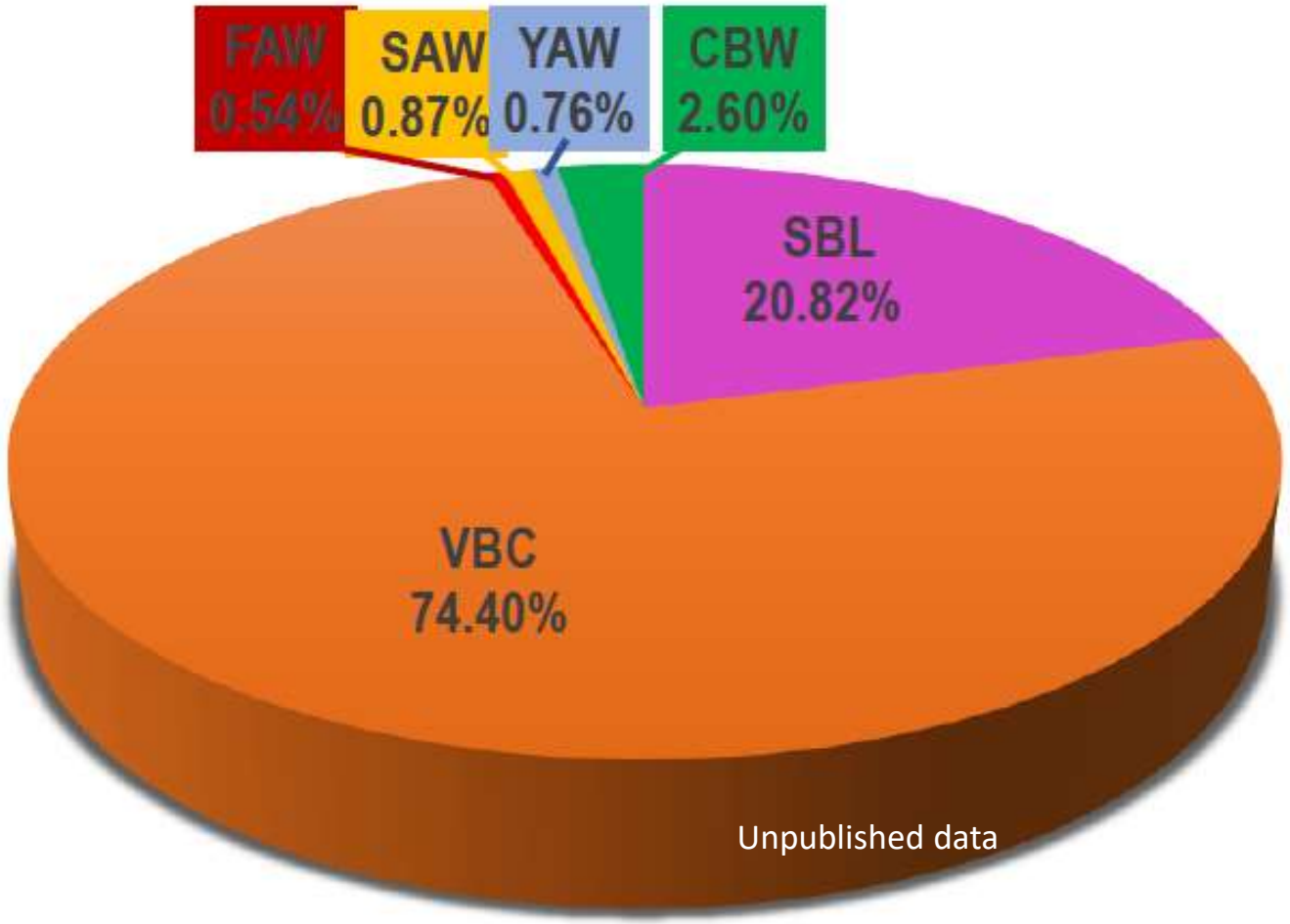


Unpublished data

Management of caterpillars

Peanut

- **Action threshold foliage-feeding caterpillars - four caterpillars/foot row**



Unpublished data

High proportion of velvetbean caterpillar

Management of caterpillars

- **Selective and/or reduced-risk insecticides:**

  Flubendiamide (Belt) – Diamide (MoA 28)

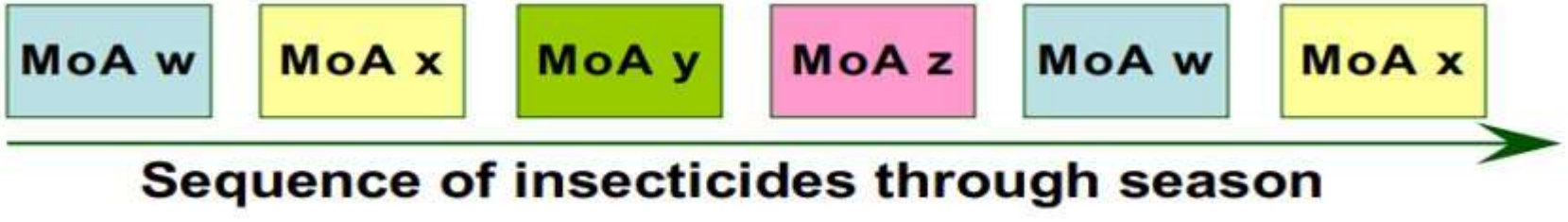
  Chlorantraniliprole (Vantacor, Besiege) – Diamide (MoA 28)

  Spinetoram (Radiant) – Spinosyns (MoA 5)

  Diflubenzuron (Dimilin) – Inhibitor of chitin (MoA 15)

  Novaluron (Diamond) - Inhibitor of chitin (MoA 15)

Rotation of Mode of Action – windows of treatment



Soybean looper – harder pest to control

- SBL eggs deposited on lower canopy
- Larval distribution in the peanut canopy

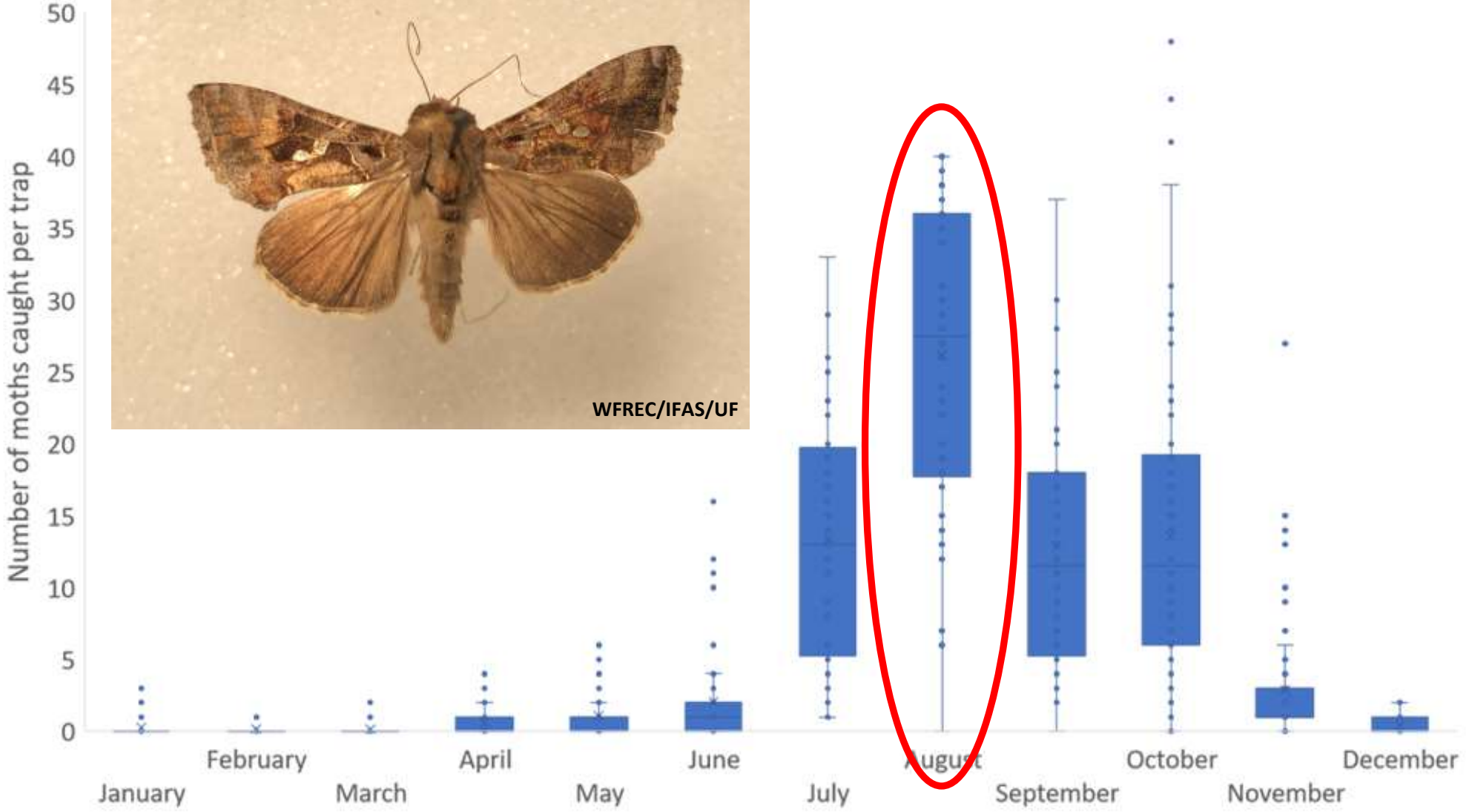
✓ 2nd instar – lower canopy

✓ 3rd & 4th instar - upper canopy

✓ 6th instar - middle canopy

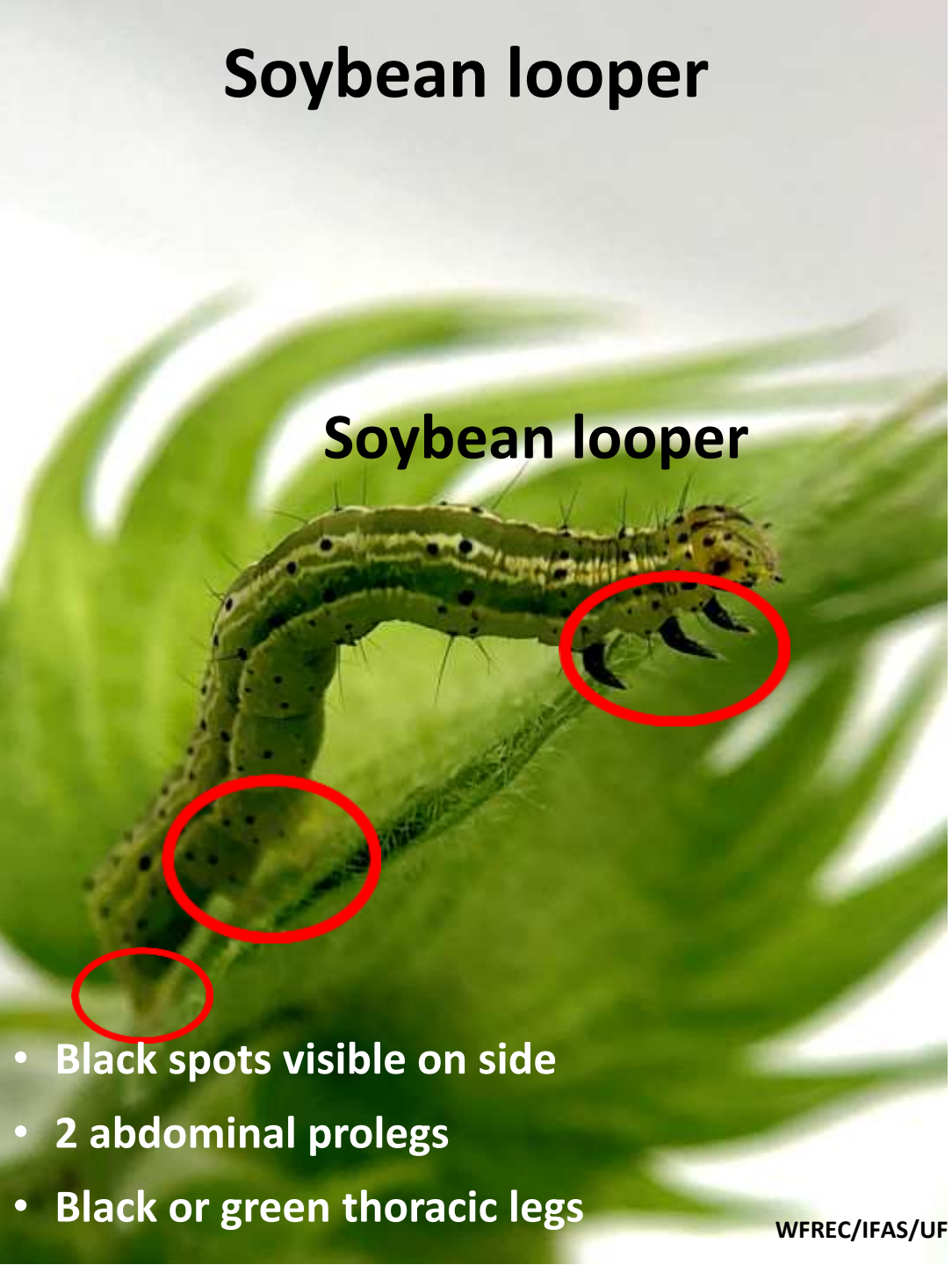
Unpublished data

Soybean looper moth flight in the region



Shaw et al., 2020

Soybean looper



- Black spots visible on side
- 2 abdominal prolegs
- Black or green thoracic legs

WFREC/IFAS/UF

How to ID the caterpillar

Velvetbean caterpillar

4 abdominal prolegs

Green with white- yellow body stripes

wikimedia.org

Stinkbugs

- Southern green stink bug
- Critical time – pod filling stage
- Delay plant maturity and seed damage
- 1 stinkbug per foot of row
- More along field edge
- Insecticides only when necessary - pyrethroids

Cotton thrips and plant bug

Take-home message

ThryvOn Cotton

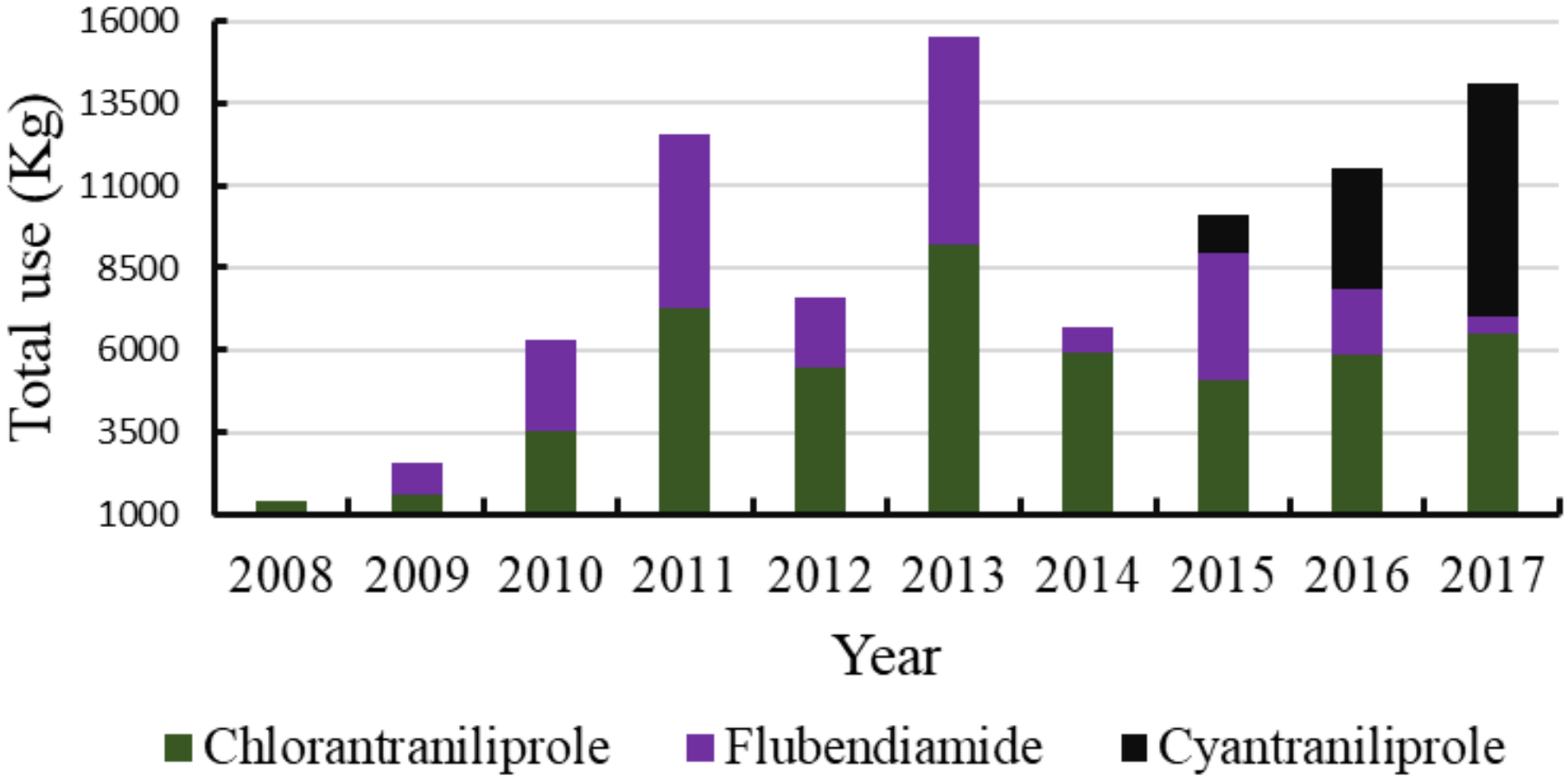
- **Does not result in high levels of thrips mortality**
- **Avoid adult thrips feeding**
- **Avoid thrips egg deposition**
- **Seed treated with imidacloprid**
- **No need for additional insecticide spray**

Caterpillars

Take-home message

- July to September – August critical time
- Flight of moths: SBL, FAW, CBW
- Sample before spraying
- Identification of the caterpillars
- Rotation of mode of action – avoid resistance
- Insecticide application – coverage is a key point

Introduction: Diamides use in Florida



https://www.sciencebase.gov/catalog/item/5e95c13a82c

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Spodoptera exigua – Beet armyworm

First resistance report BAW to diamide Chlorantraniliprole in the U.S. – Florida Panhandle

Rabelo et al., 2021

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BAW resistance to chlorantraniliprole

- Resistance to bifenthrin and chlorantraniliprole
- Peanut and soybean commercial fields from Florida Panhandle
- 2024 field population collections

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Acknowledge

Florida Peanut Check off

National Peanut Board℠

Cotton Incorporated

USDA United States Department of Agriculture

National Institute of Food and Agriculture

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