Scout School
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Corn

Stinkbugs

- Damage on corn seedlings
- Late-vegetative stages - highest population around the tasseling stage

Stunned plants

Crooked ears and missing kernels

Reduction in kernel size and fungus

Kernel abortion
Fungal growth from stinkbug feeding

Stinkbugs

Predator
Thick antenna and rostrum

Pest
Thin and long antenna and rostrum

Stinkbug Pests

Brown Stink Bug
(*Euschistus servus*)

Southern Green
(*Nezara viridula*)

Green Stink Bug
(*Chinavia hilaris*)

B. Marmorated
(*Halyomorpha halys*)

Stinkbugs

Brown marmorated stink bug
Alternate white and brown segments

Brown stink bug
Lack of white-colored segments on the antennae

Stinkbugs

Scouting

- start close tasseling stage
- Goal – protect the primary ear
- Scout on the edge of the field – all edges
- If 13 insects in 100 plants are detected – spray
- No-till fields – high populations
- Wood areas – overwintering sites

Brown stinkbug feeding on stalks and hiring at the base of leaves

Management

- Bifenthrin
- Coverage of canopy - critical

Helicoverpa zea

Corn earworm

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Spodoptera frugiperda

Fall armyworm

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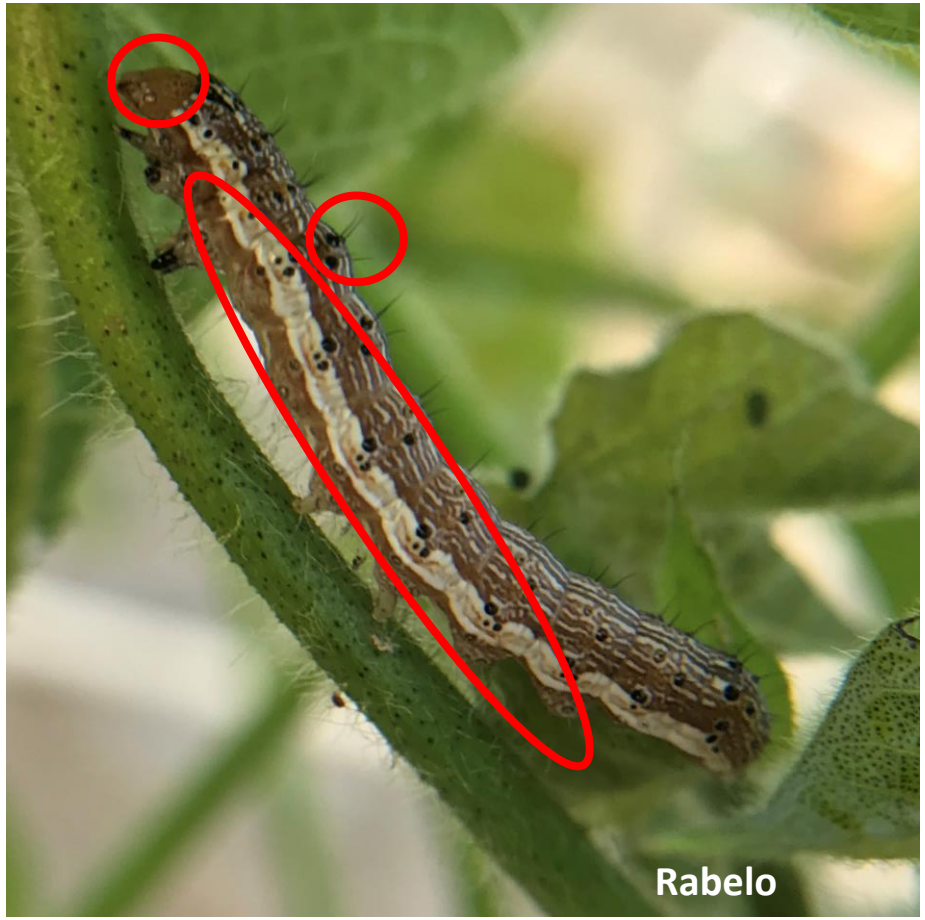
Corn earworm

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



Armyworms (*Spodoptera spp.*)

- **Upside down “Y” on forehead**
- **Variety of colors**
- **Smooth body**

Malcohn, E., Flickr.com

Baldwin, J

Corn earworm vs FAW

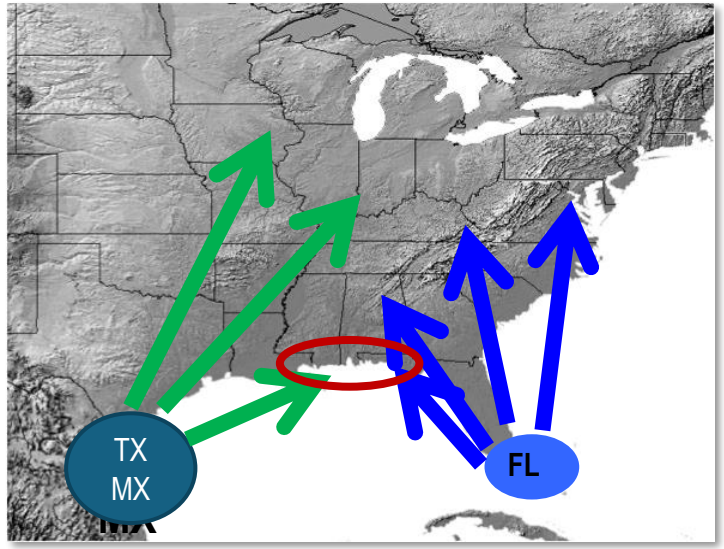
Corn earworm

FAW

Upside down “Y” on forehead

Phenology of flight CEW/FAW in the Florida Panhandle

- Year-round pheromone trapping - since 2017
- Corn, peanut, and cotton
- Delta Pherocon® VI traps (Trécé Incorporated)
- Scentry PSU pheromone lures (Scentry Biological Inc.)



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Pheromone Traps and Lures

www.coopermill.com

www.scentry.com

www.trece.com

Corn earworm

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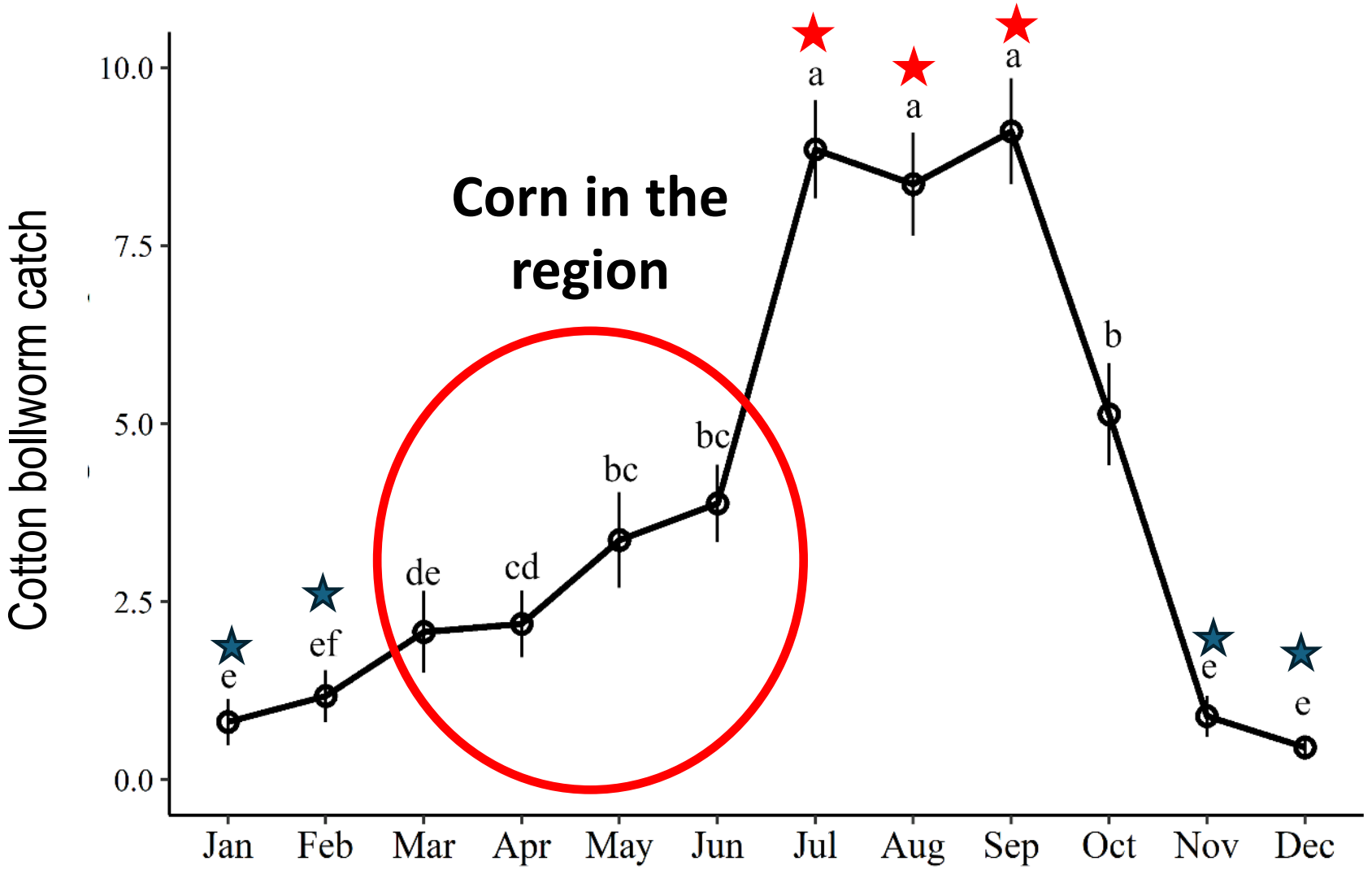
Corn earworm moth flight in the region



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

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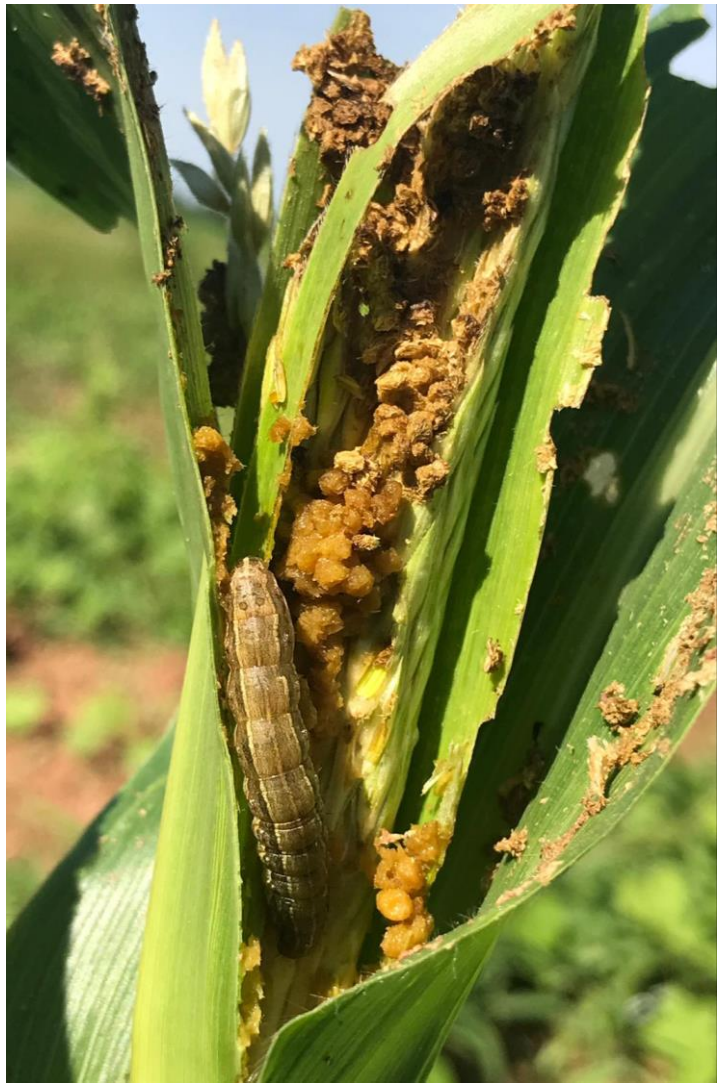
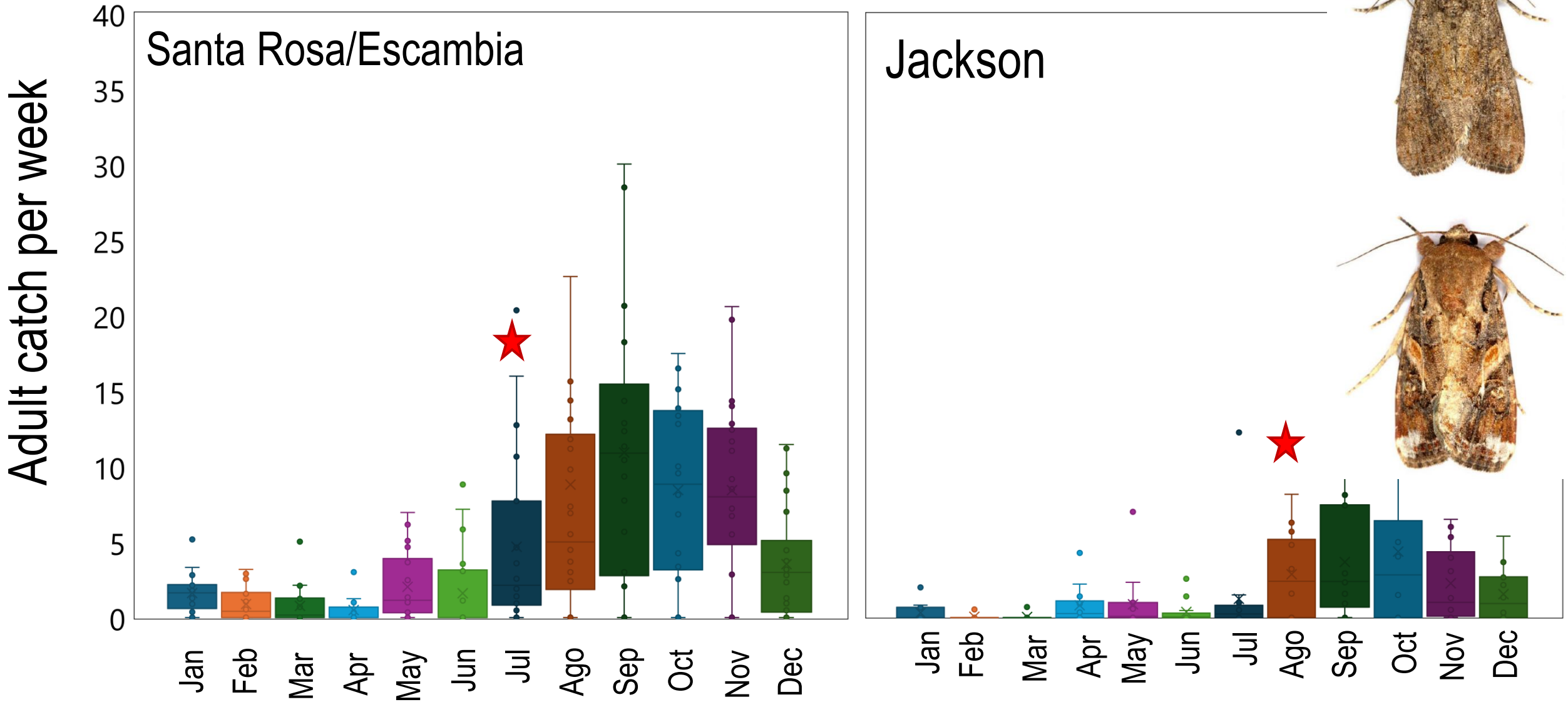
Fall armyworm

Egg mass



Year-round FAW light in the Florida Panhandle



Fall armyworm

Feeding site defined by young larvae

Pest – vegetative and reproductive crop stages

Corn in vegetative stage:

- **Leaf consumer**
- **Seedlings – dead heart**

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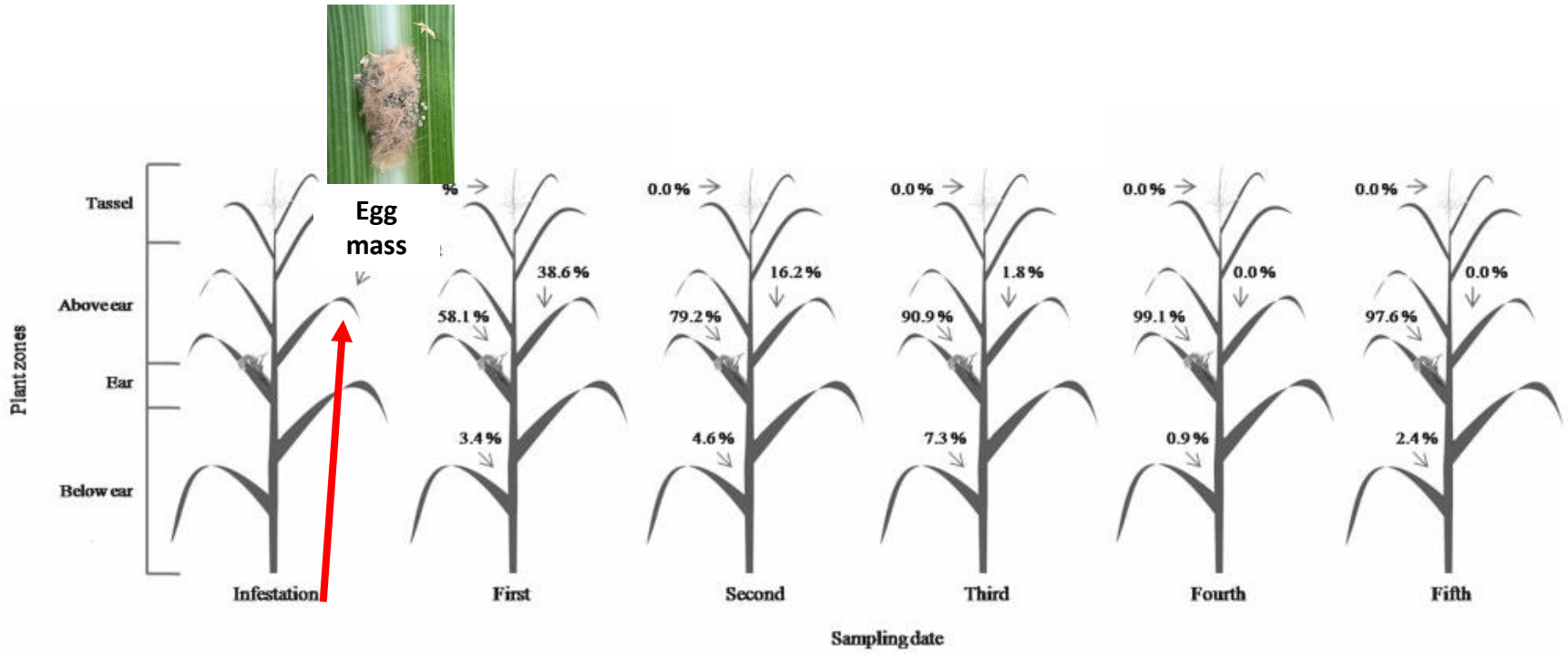
FAW IPM/IRM

- **FAW larval plant-to-plant movement** Pannuti et al., 2016



0.76 m btw corn rows
0.18 m within corn row

- **FAW management**

Short time window before larval establishment

Key points when spraying - coverage feeding sites, spray volume, flat nozzle

Paula-Moraes et al. 2017

Fall armyworm

Feeding site defined by first-instar

Pest – vegetative and reproductive crop stages

Maize in reproductive stage:

- **Feeding size - ear zone site**
- **Silk not suitable – growth**
- **Feeding on kernels – faster development**

Bentivenha

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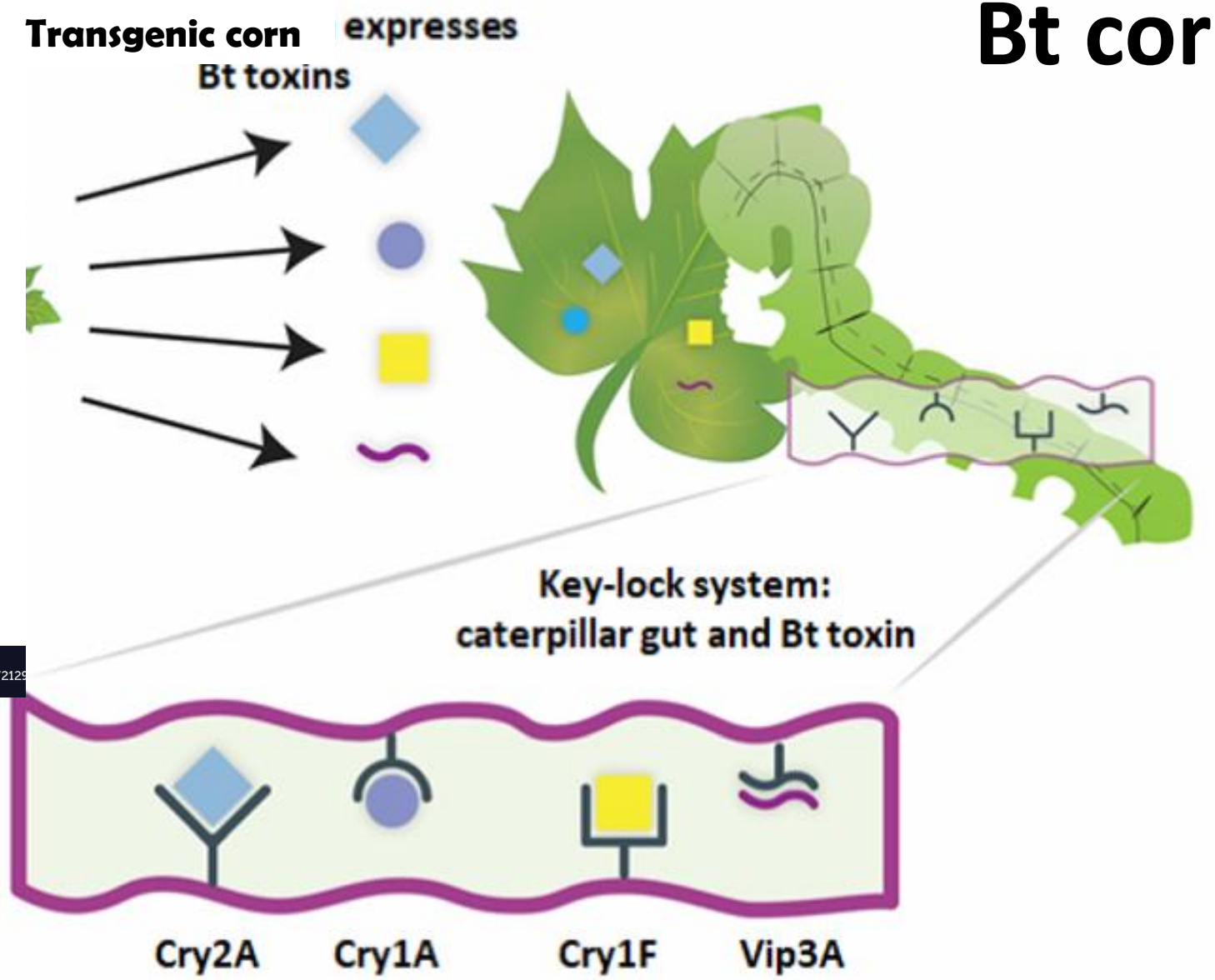
Bt corn



Design by S. Rodriguez

Bt corn commercial traits

Trademark	Abbreviation	Proteins/Traits	Target Insect Pest(s)
Trecepta	TRE	Cry1A.105 + Cry2Ab2 + VIP3A + glyphosate tolerance	corn borer spp., corn earworm, fall armyworm
Genuity SmartStax	VT3P/HXX	Cry3Bb1 + RR2 + Cry1A.105 + Cry2Ab2 + Cry34Ab1 + Cry35Ab1 + Cry1F + LL	corn rootworm, corn borer spp., corn earworm, fall armyworm
Genuity VT Triple Pro	VT3P	Cry3Bb1 + RR2 + Cry1A.105 + Cry2Ab2	corn rootworm, corn borer spp., corn earworm, fall armyworm
Genuity VT Double Pro	VTPRR2	Cry1A.105 + Cry2Ab2 + RR2	corn borer spp., corn earworm, fall armyworm
Roundup Ready Corn 2	RR2	RR2	---
PowerCore	PW/LL/RR2	CryA.105+Cry2Ab2+Cry1F+glufosinate tolerance+glyphosate tolerance	corn borer spp., corn earworm, fall armyworm
Agrisure 3122	RW/CB/LL/HX1/HXRW/GT	Modified Cry3A + Cry1Ab + Cry1F + Cry34Ab1 + Cry35Ab1 + LL + RR2	corn rootworm, corn borer spp., fall armyworm
Agrisure Viptera 3110	CB/LL/Viptera/GT	Cry1Ab + Vip3A + glufosinate tolerance + glyphosate tolerance	corn borer spp., corn earworm, fall armyworm
Agrisure Viptera 3111	CB/LL/RW/Viptera/GT	Cry1Ab + modified Cry3A + Vip3A + glufosinate tolerance + glyphosate tolerance	corn rootworm, corn borer spp., corn earworm, fall armyworm
Agrisure Viptera 3220	CB/LL/GT/Viptera/HX1	Cry1Ab + Vip3A + glufosinate tolerance + glyphosate tolerance + Cry1F	corn borer spp., corn earworm, fall armyworm
Agrisure GT	GT	glyphosate tolerance	---
Optimum Intrasect	YGCB/HX1/LL/RR2	Cry1Ab+Cry1F+LL+RR2	corn borer spp., fall armyworm
Optimum Leptra	HX1/YGCB/Viptera/LL/RR2	Cry1F+Cry1Ab+Vip3A+glufosinate tolerance+glyphosate tolerance	corn borer spp., corn earworm, fall armyworm
Optimum TRIsect	RW/YGCB/HX1/LL/RR2	Modified Cry3A+Cry1Ab+Cry1F+LL+RR2	corn rootworm, corn borer spp., fall armyworm

Transgenic Bt sweet corn

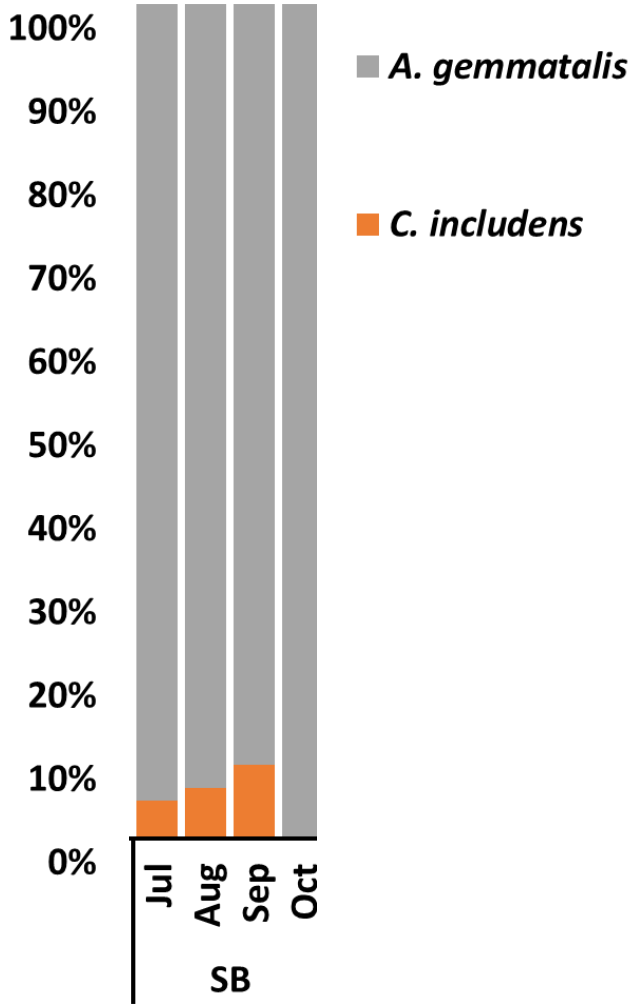
Hybrid	Bt trait
Remedy	Cry1Ab+Vip3Aa
Obsession II	Cry1A.105+Cry2Ab2
BC0805	Cry1Ab

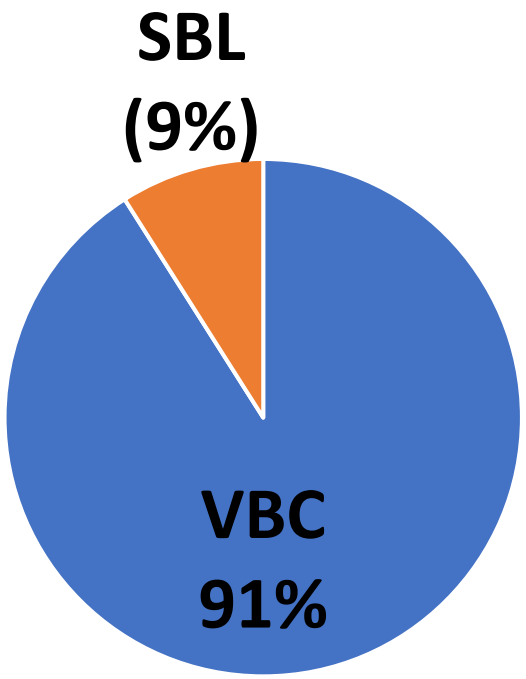
Attribute II Trait – Syngenta – Vip3Aa toxin

Soybean

Management of caterpillars

High proportion of velvetbean caterpillar



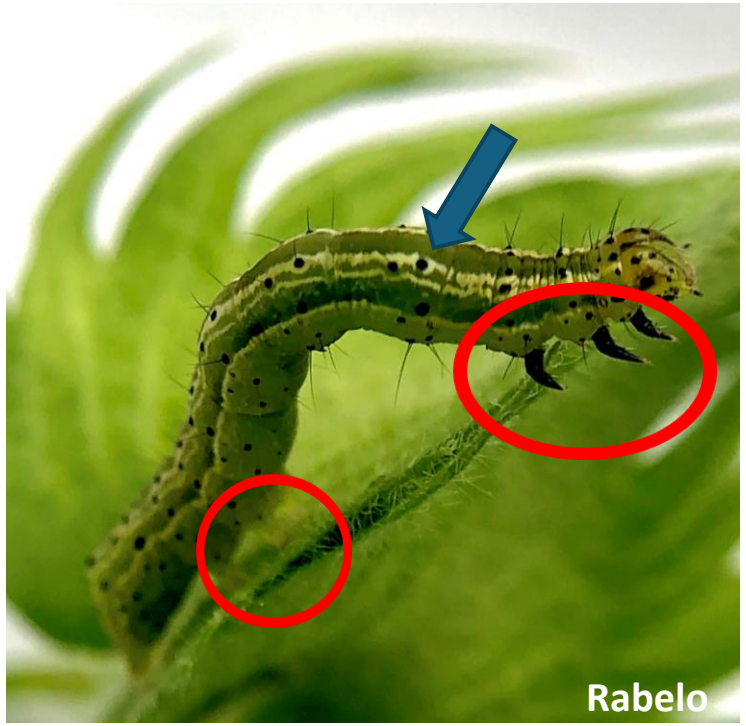


Proportion of lepidopteran pests in soybean – WFREC/UF – 2019 and 2020

Unpublished data

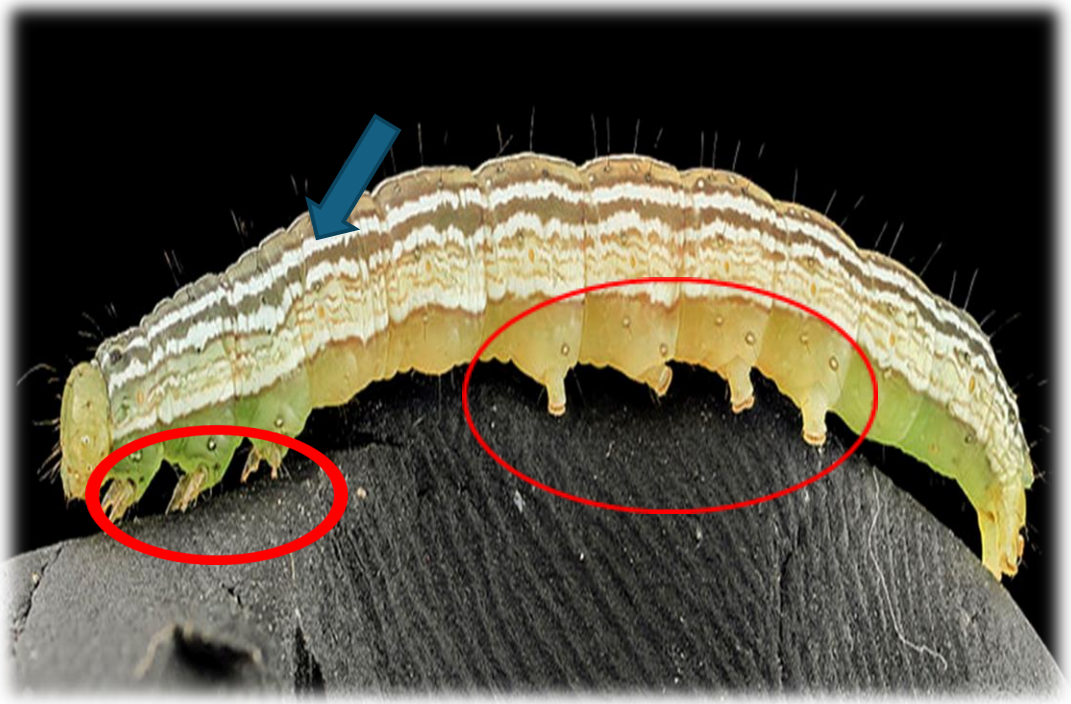
Soybean looper vs velvetbean caterpillar

Soybean looper



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

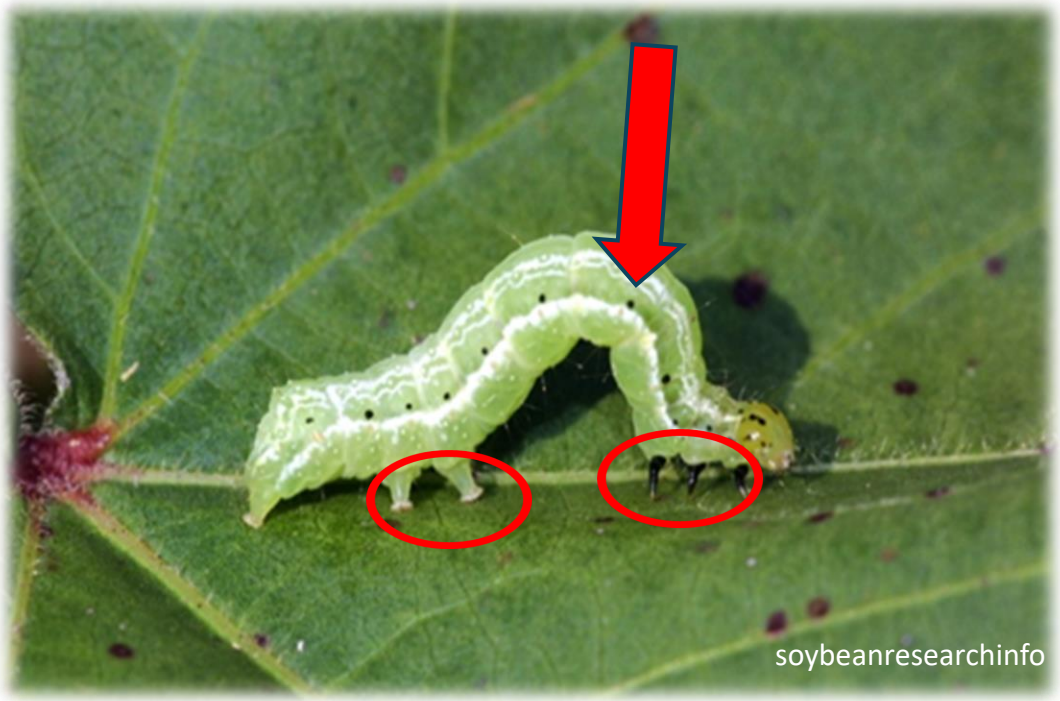
Velvetbean caterpillar



- No black spots visible on side
- 4 abdominal prolegs
- No black thoracic legs

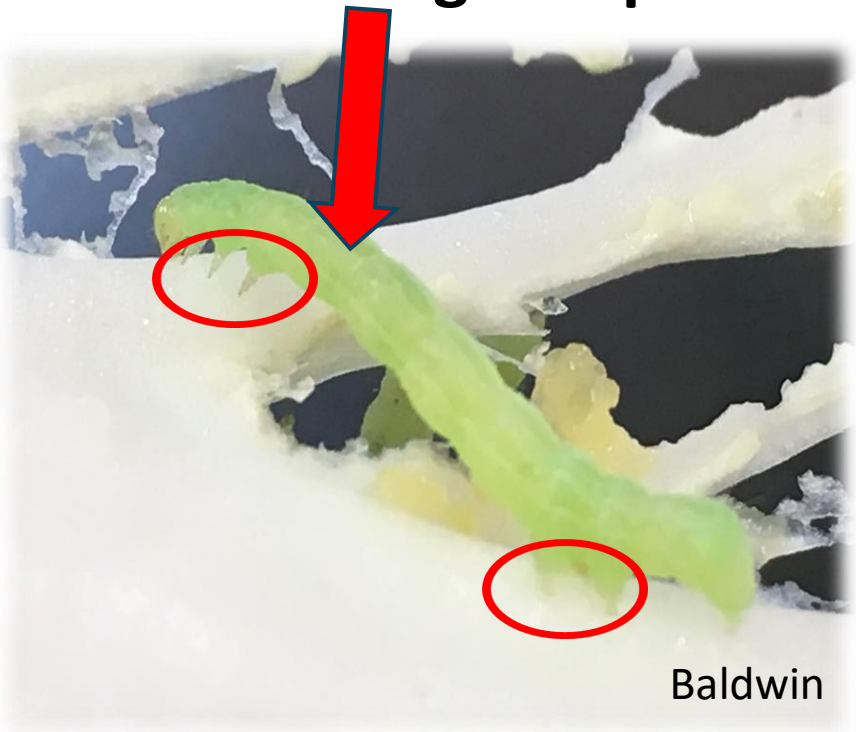
Soybean looper vs cabbage looper

Soybean looper



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

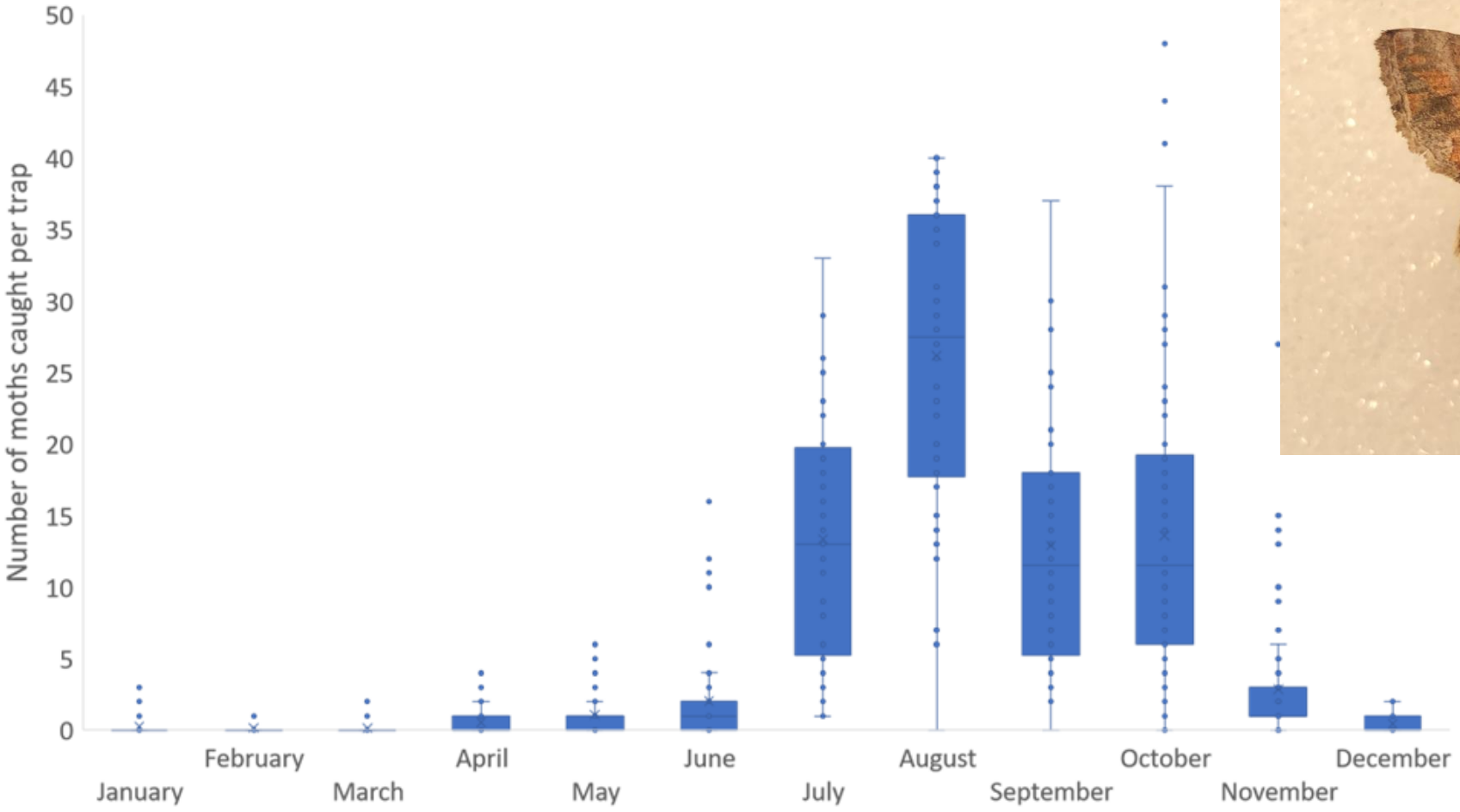
Cabbage looper



- Green thoracic legs
- 2 abdominal prolegs
- No black spots visible on side

Soybean looper

Flight of the Moths

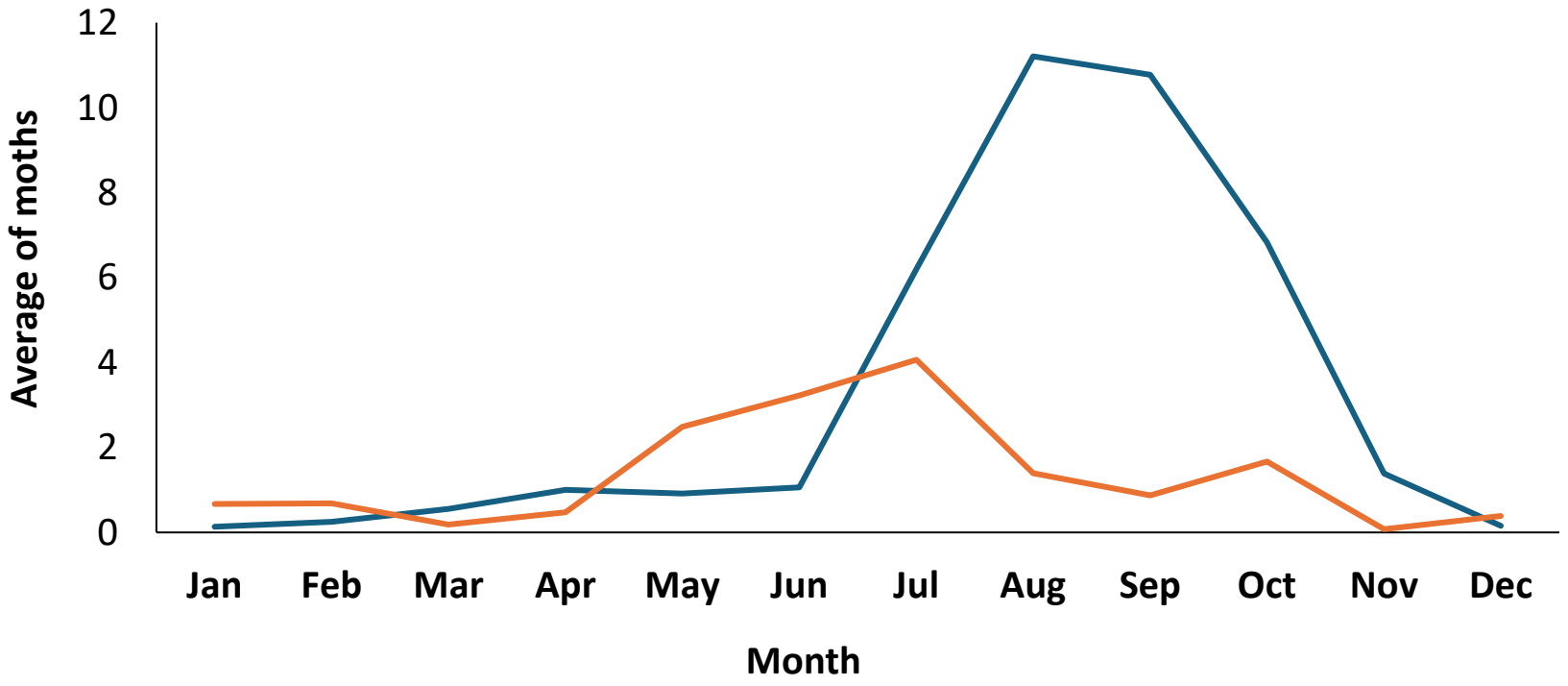


Shaw et al., 2020

Soybean looper

- **SBL Pheromone lure - cross-attraction – other Plusiinae**

Timing of *C. includens* flight – after *Ctenoplusia oxygramma*



C. includens

Ctenoplusia oxygramma
blade-like stigma

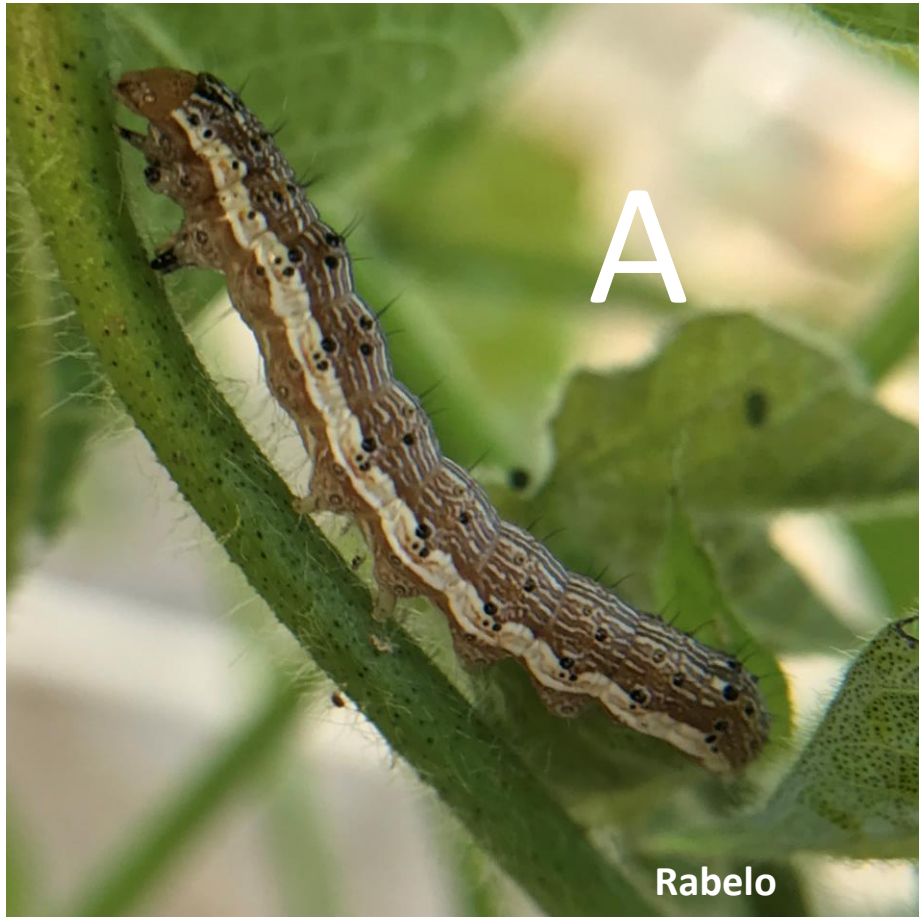
Scouting of caterpillars

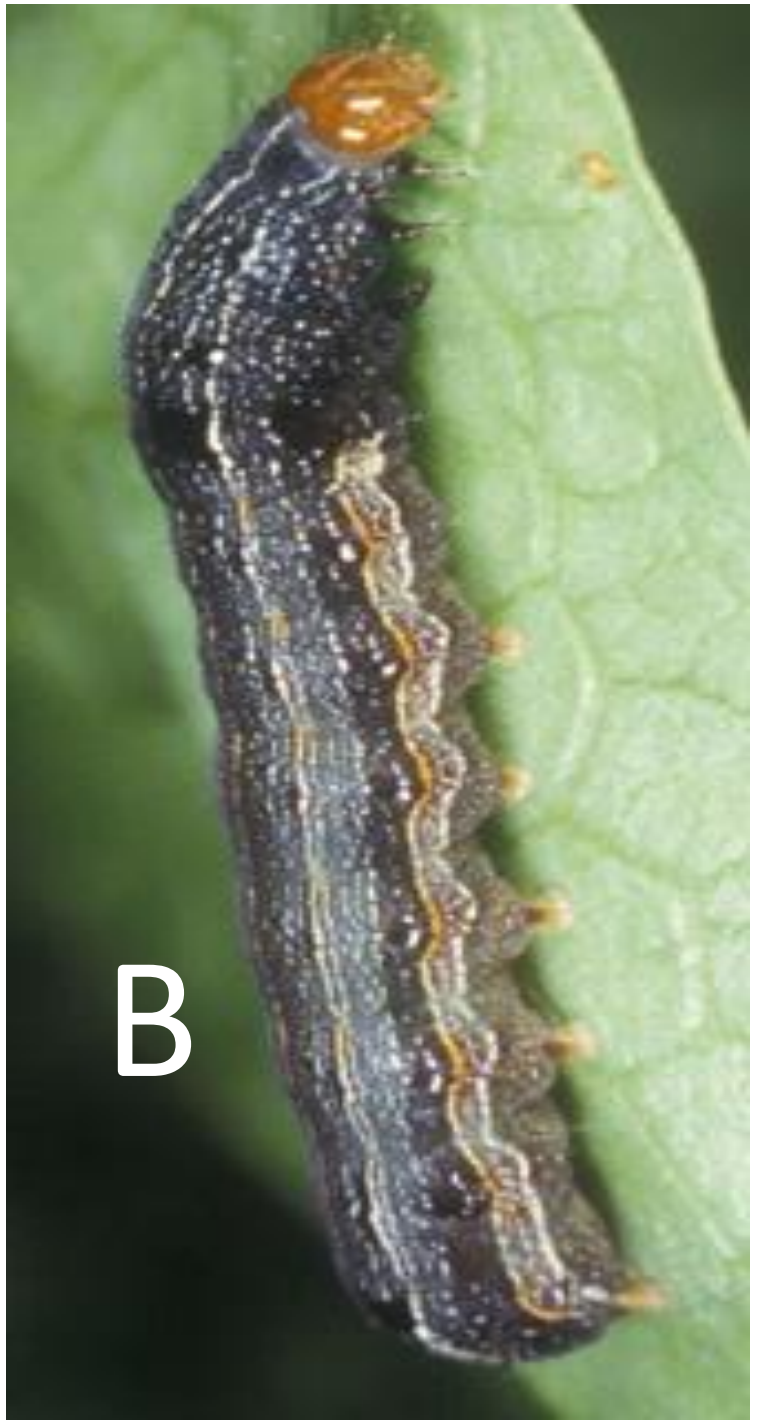
Beat cloth

Four or more caterpillars per row

Which caterpillar is soybean looper:

1) A
2) B
3) A and B





Which caterpillar is corn earworm:

1) A
2) B
3) A and B

Management of caterpillars in soybean

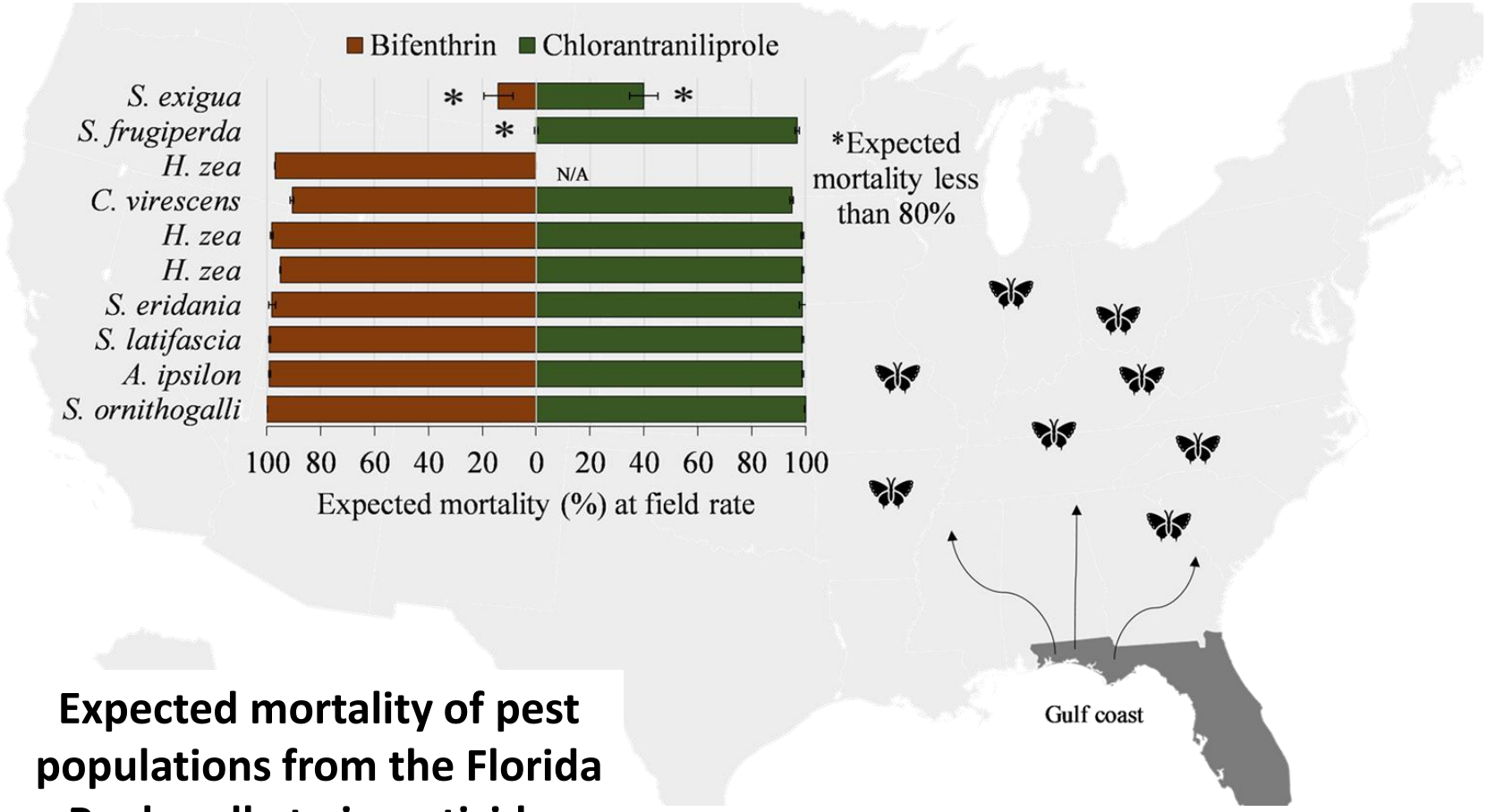
Scouting:

- **Prior brooming – soybean tolerates 30-35% defoliation**
- **From bloom through pod set - loss should not exceed 20-25%**
- **Reproductive stage 15-20%**

A B C D E D

Performance of insecticides to caterpillars in the Florida Panhandle

- **Insecticide susceptibility monitoring**



Expected mortality of pest populations from the Florida Panhandle to insecticides

- **Pyrethroid – low performance FAW, SBL**
- **First resistance report of beet armyworm to diamide in the U.S.**

Management of caterpillars in soybean in the context of Insect Resistance Management

Scout and only use insecticide when necessary

Rotate different modes of action:

- **Vegetative to early bloom**

Diamides (Vantacor, Besiege) and IGH – chitin inhibitors (Dimilin, Diamond) – caterpillar is small

- **Bloom to early pod filling**

Spinosyns (Radiant, Blackhawk) and Pyrethroids (Bifenthrin)

- **Pod filling – if needed**

Indoxacarb (Steward)

Coverage is a key point

Soybean looper

Insecticide delivery in the lower plant canopy

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

2nd instar - lower

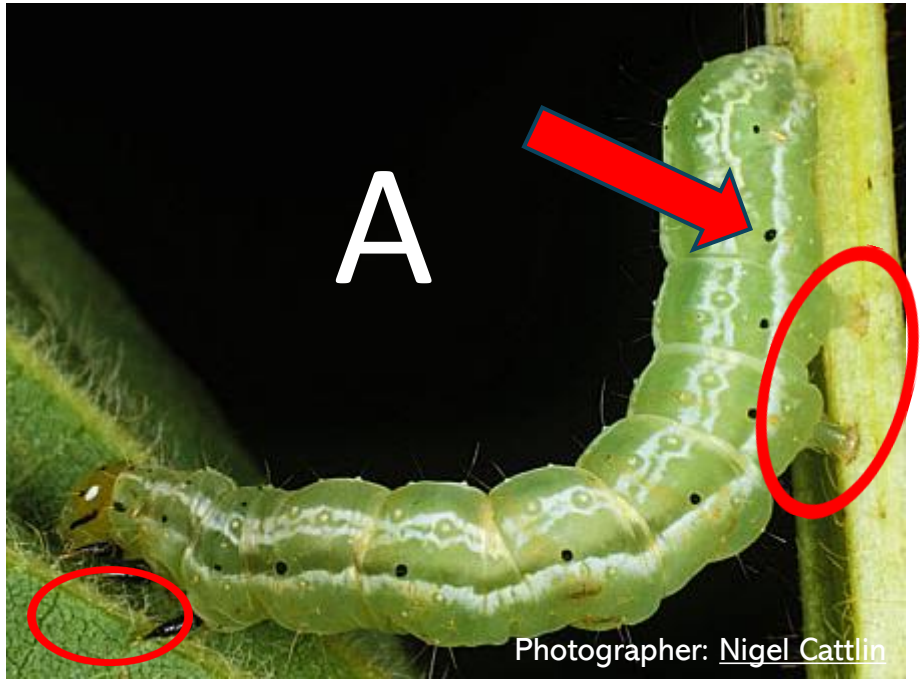
3rd & 4th instar - upper canopy

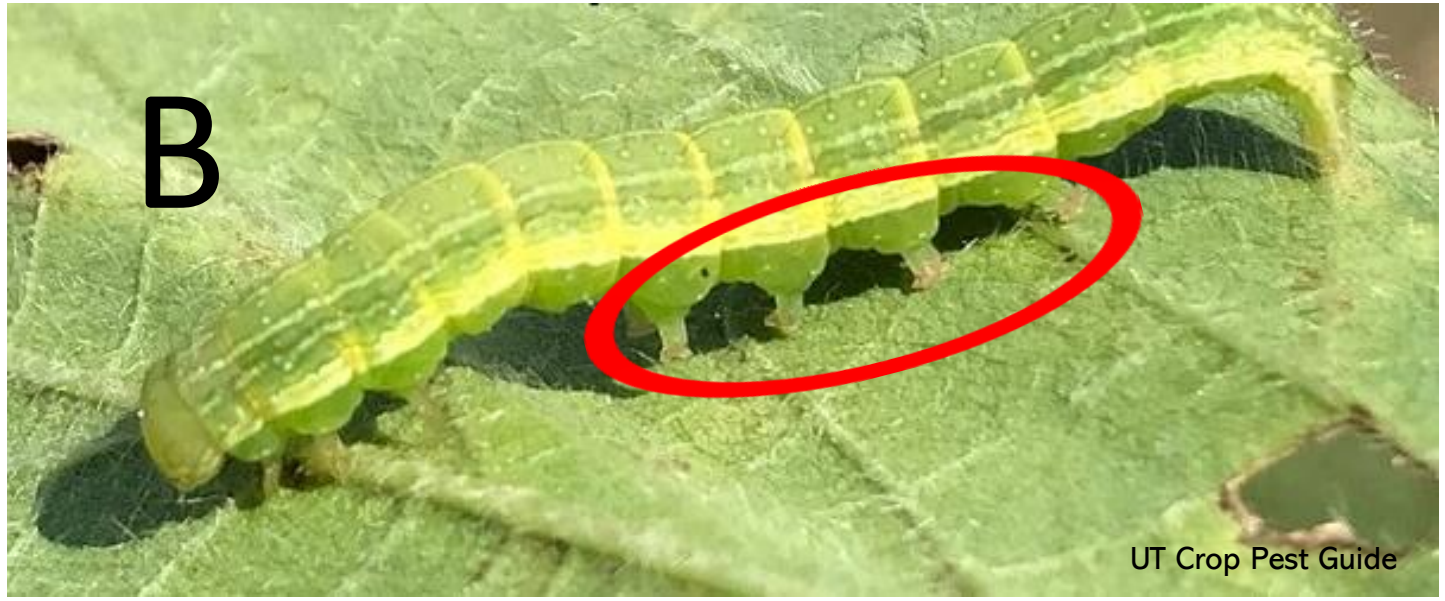
6th instar - middle canopy

Caterpillars

Take-home message

- End July – End September – August critical time
- Flight of moths: SBL, FAW, CEW
- Sample before spraying
- CEW – ear tip feeding – not damage in corn field
- Identification of the caterpillars – soybean
- Soybean: selection of the right insecticide – cases of resistance
- Insecticide application – coverage is a key point





Which caterpillar is soybean looper:

1) A

Black thoracic legs

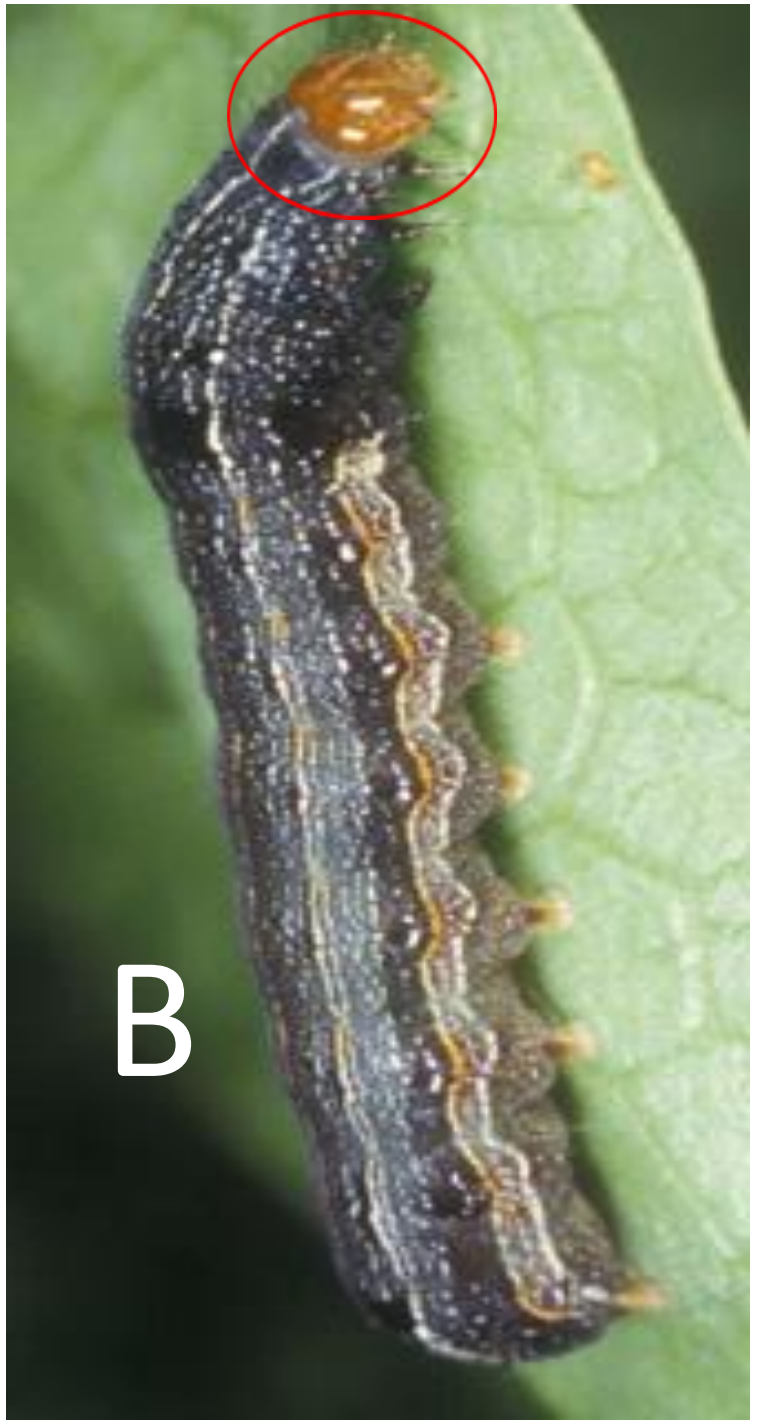
2 abdominal prolegs

Black spots visible on side

Which caterpillar is corn earworm:

1) A

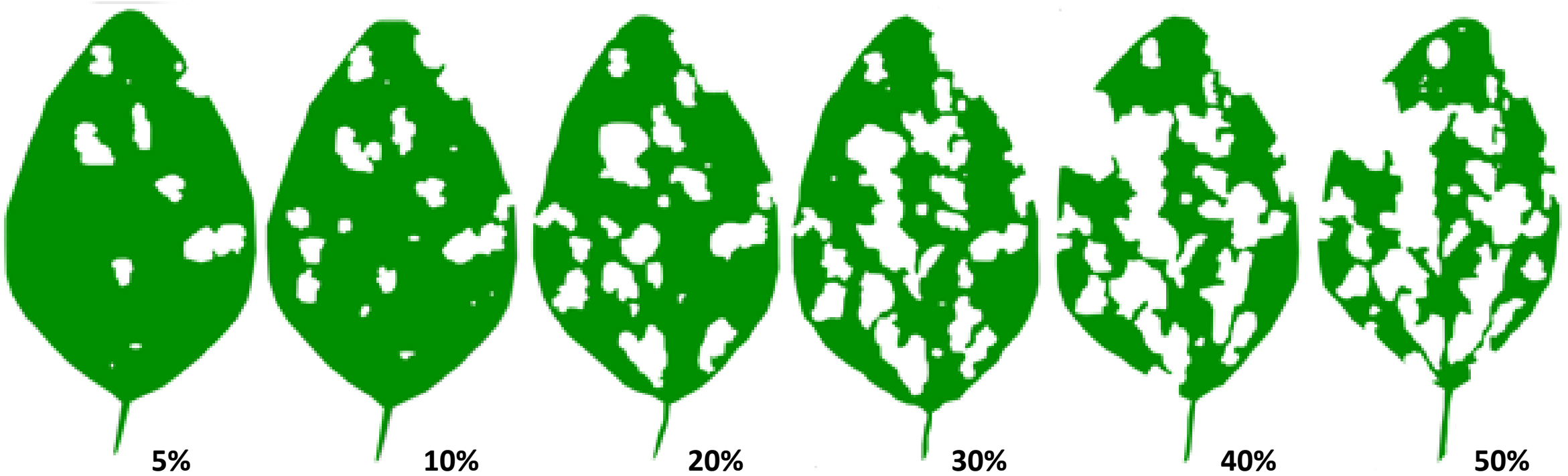
Spines present



Upside down “Y” on forehead

And

Smooth body



People used to overestimate defoliation levels

Tip:

Focus in the area you have

Questions?

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