

Caterpillars in Crops



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West Florida Research and Education center



Southeastern Coastal Plains

- Peanuts and cotton - profitable crops – peanut-winter fallow-cotton rotation
- 5-7 weeks of variability from year to year - plant and occurrence of pests
- Survival and impact of the pests



Ecological transition zone - temperate and subtropical climates



Southeastern Coastal Plain and Piedmont

Entomology Program – row crop pests

2017 Crop Protection and Pest Management Extension Implementation Project for the University of Florida

- Knowledge pests and beneficial insects associated with cotton in the Florida Panhandle
- Evaluate stage-specific occurrence and abundance of the pests and beneficial insects
- Produce management guides for the region

Sentinel plots
at Jay, FL



Pest
samplings

Sampling in
commercial fields



flacrops.com

Entomology Program – row crop pests

2017 Crop Protection and Pest Management Extension Implementation Project for the University of Florida

- Survey of caterpillars in Florida Panhandle
- Pheromone traps – occurrence of moths in the region



Entomology Program – row crop pests

How does the pheromone trap work?



Entomology Program – row crop pests

How does the pheromone trap work?

Fall
armyworm

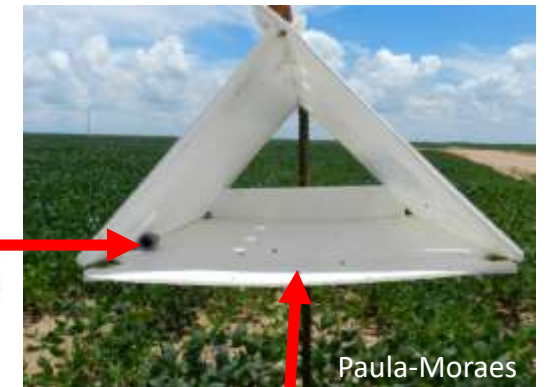
Corn
earworm

Soybean
looper



Sexual pheromone of the
female moth

Paul Verschure



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Farmer survey

-Voluntary participation



Baldwin



Paula-Moraes

Entomology Program – row crop pests

**Corn earworm
CEW**

**Fall armyworm
FAW**

**Soybean looper
SBL**

**Why these
species?**



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Fall armyworm

- **duration of adult life – 7 to 21 days**
- **disperses long distances annually - during the summer months**
- **strong flier - all states east of the Rocky Mountains**

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Fall Armyworm

- **Present in all American continents – not in Alaska and Canada**
- **Minnesota and New York – One generation**
- **Kansas – two generations**
- **South Carolina – three generations**
- **Louisiana – four generations**
- **Coastal areas of north Florida - moths are abundant**

from April to December

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Fall armyworm

- Larva causes damage by consuming foliage and burrow into the ear, pods and bolls



Valicente

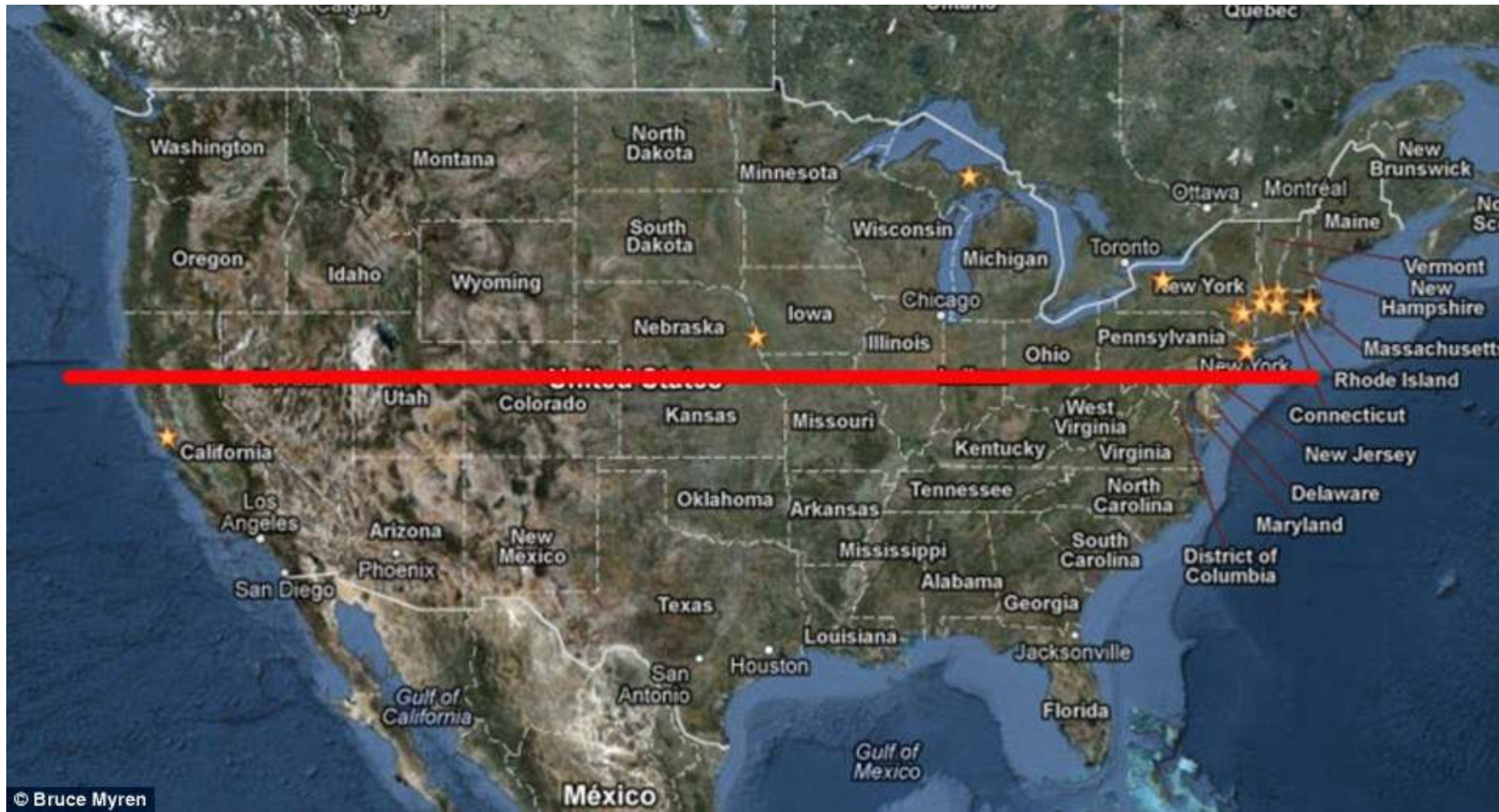
Entomology Program – row crop pests

Corn earworm or cotton bollworm

- **duration of life – around 30 days**
- **disperses long distances annually**
- **during the summer months**
- **strong flier**

Entomology Program – row crop pests

Corn earworm or cotton bollworm



Migration in
the summer

40°N
latitude -
survival in
the winter

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Corn earworm or cotton bollworm

- **Canada, Minnesota, and western New York – one generation**
- **Northeastern states – two generations**
- **Louisiana and southern California – four to five generations**
- **Florida – seven generations**

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Corn earworm or cotton bollworm

- **Larva causes damage by burrowing into the ear, pods and bolls**

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Identification of caterpillars

Fall armyworm

- **Larva does not feel rough to the touch - lacks the microspines**

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Corn earworm

- Larva does feel rough to the touch – presence of the microspines

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Soybean looper

- **Duration of life – around 26 days**
- **Survival during the winter**
- **South Florida and south Texas**

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Soybean looper

Caterpillar makes a loop or hump when crawling
two abdominal prolegs

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University of Georgia

Pest Management

Silverleaf whiteflies

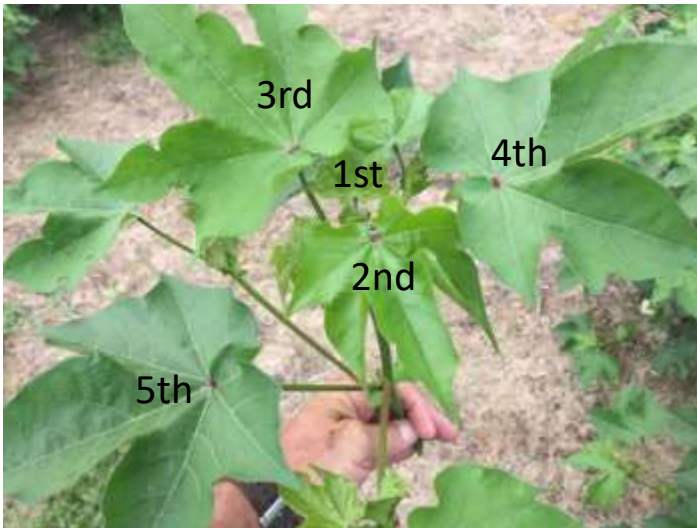
- Risk for SLWF problems: Hairy leaf > smooth leaf cotton
- Late planted > early planted cotton
- Hot and dry > rainy conditions
- Source of infestation – vegetables and melon crops
- Management decisions – routine sampling

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Silverleaf whiteflies in cotton Pest Management

Routine sampling

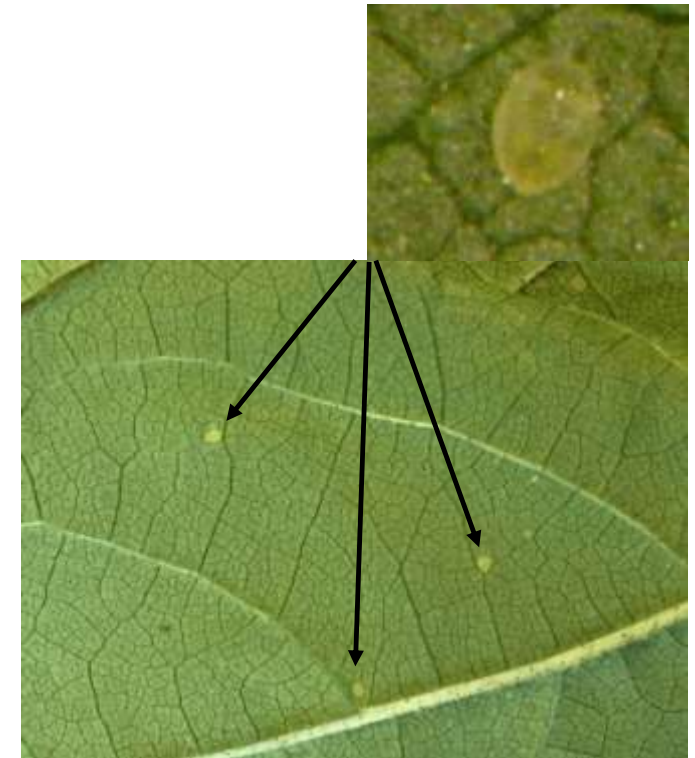
- 25 plants – 10 paces apart
- Turn the 5th main stem leaf – slowly
- Leaves are considered infested:



Find the 5th main stem leaf
below the terminal



if 3 adult SLWFs are
observed



if 5 immatures are
observed

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Silverleaf whiteflies in cotton **Pest Management**

Treatment - when 50 percent of sampled leaves are infested with immatures

Insecticides	Safety to Beneficials	Control Interval ¹	Life Stages Affected
<i>Pyriproxyfen</i> - Knack	Excellent	14-30 days	Eggs and mature nymphs
<i>buprofezin</i> - Courier	Excellent	14-30 day	Nymphs
<i>acetamiprid</i> - Assail, other	Moderate	14-21 day	All stages
<i>flupyradifurone</i> - Sivanto	Good	7-21 days	All stages
<i>dinotefuran</i> - Venom	Moderate	7-14 days	All stages
<i>spiromesifin</i> - Oberon	Good	14-21 ddays	Primarily nymphs

¹Control interval dependent on rate, timing of application, reinfestation rate and pest pressure, and beneficial insect populations

Backbone of SLWF management

Slow effect – IGRs

Long residual activity

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Caterpillar management - Peanut

Sampling methods

Beat cloth



Plant inspection



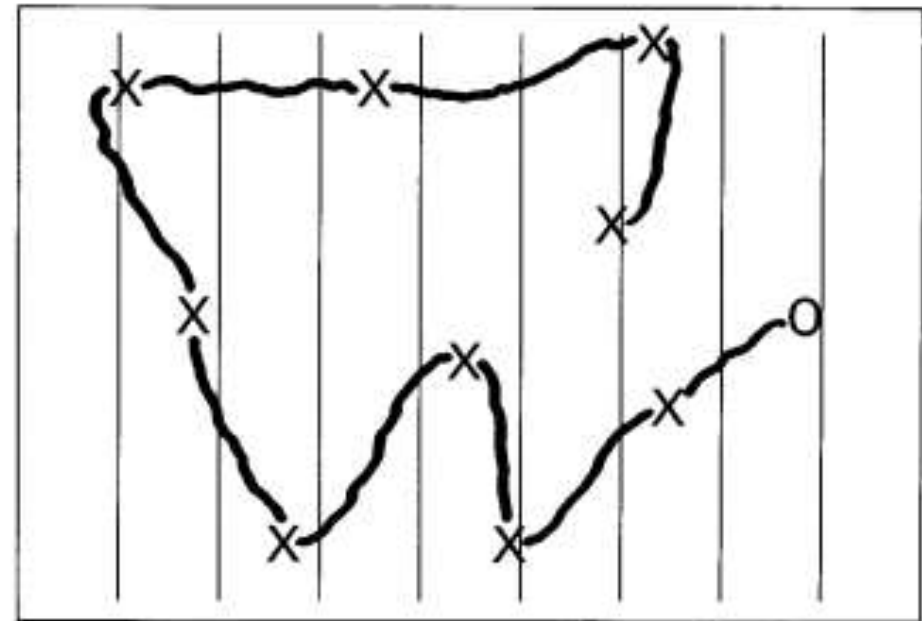
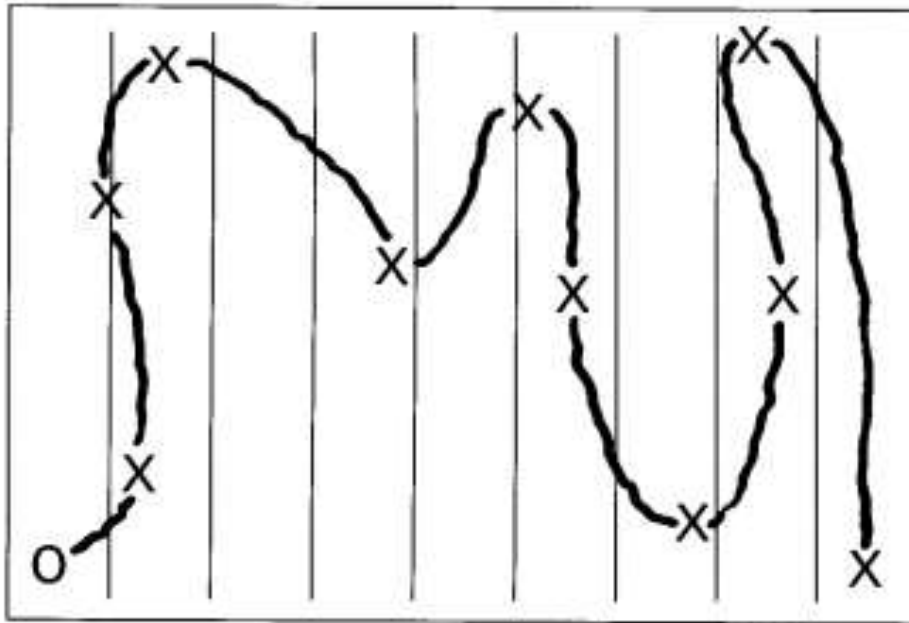
Sweep net



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Caterpillar management - Peanut

- Scout weekly or more often
- Sampling area - divide the field in areas with 20 acres



O = Start X = Scouting Site

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Caterpillar management - Peanut

- Caterpillar thresholds – 4-8 caterpillars/foot

Examples of insecticides	Rates
<i>Indoxiacarb</i> – Steward EC	9.2 – 11.3oz.
<i>Methomyl</i> – Lannate 2.4LV	0.75-1.5pt
<i>Spinosad</i> – Tracer 4SC	1.5-3fl.oz
<i>Bifenthrin</i> - 2EC	2.1-6.4fl.oz.

Extension - Alabama A&M Auburn Universities

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Caterpillar management - Peanut

Sampling methods – beat cloth

Soybean looper

- Feed and hold tenaciously - bottom of the peanut canopy
- On the leaf underside
- Difficult to control
- Spray coverage – key point

Beat cloth



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Caterpillar management - Peanut

- Insecticides
- Rotate synthetic pyrethroids with selective insecticides
- Hot summer months
- Prevent spider mite outbreaks



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Caterpillar management - Cotton

Transgenic Technology - GMO

HT – Herbicide Tolerant

- **GT – glyphosate tolerant**
- **LL Liberty Link – glufosinate-tolerant**
- **RR2 Roundup Ready 2 - glufosinate-tolerant**

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Caterpillar management - cotton

Transgenic Technology - GMO

IR – Insect Resistance – Bt technology

Caterpillar management in cotton

Bt Cotton

Paula-Moraes & Specht, 2017

Comercial name	Company	Variety Brands	Bt toxins					
			Cry1Ac	Cry1F	Cry1Ab	Cry2Ab2	Cry2Ae	VIP3Aa20
Bollgard®	Monsanto	Deltapine	X					
Bollgard II®	Monsanto	Deltapine	X			X		
Bollgard III®	Monsanto	Deltapine	X			X		X
Widestrike II ®	Dow	Phytogen	X	X				
Widestrike III ®	Dow	Phytogen	X	X				X
TwinLink ®	Bayer	FiberMax, Stoneville			X		X	
TwinLink Plus ®	Bayer	FiberMax, Stoneville			X		X	X

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Transgenic Technology - Bt



Level of control of Bt toxins in cotton - cotton bollworm

Reports of escapes – NC

>2nd instar

Non-high dose to
cotton bollworm

high dose to
cotton bollworm

Comercial name	Company	Variety Brands	Bt toxins					
			Cry1Ac	Cry1F	Cry1Ab	Cry2Ab2	Cry2Ae	VIP3Aa20
Bollgard II®	Monsanto	Deltapine	X			X		
Bollgard III®	Monsanto	Deltapine	X			X		X
Widestrike II ®	Dow	Phytogen	X	X				
Widestrike III ®	Dow	Phytogen	X	X				X
TwinLink ®	Bayer	FiberMax, Stoneville			X		X	
TwinLink Plus ®	Bayer	FiberMax, Stoneville			X		X	X

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Transgenic Technology - Bt

DP1538 B2 XF

DP = Deltapine

Cultivar number

Bolgard II = Cry1Ac + Cry2Ab2

Herbicide resistant trait



UF Startup funds

Peanut Check-OFF Funds - 2017-18 Funding Cycle

2017 - NIFA CPPM EIP

Thank you