



Cotton Insect Pest Management Update

Phillip Roberts, Entomologist – Cotton

Georgia Cotton Commission Annual Meeting

January 25, 2023



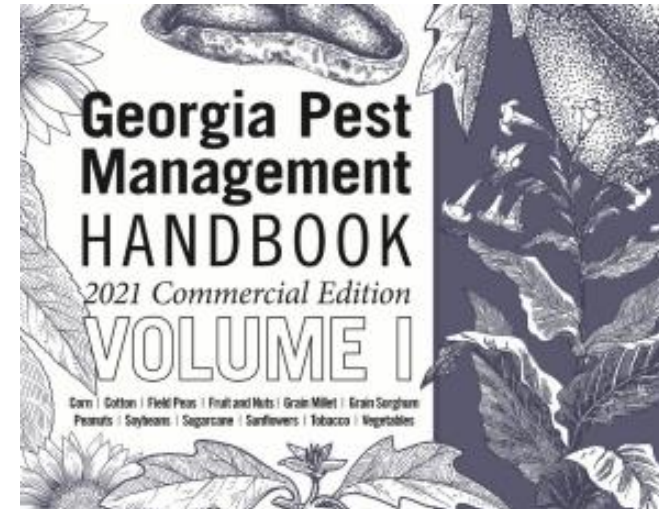
Scouts/Consultants

- Offers great value to growers.
- **IPM:** all available control tactics.
 - Cultural Practices
 - Beneficial Insects
 - Insecticides
- Must know insect pest populations and species makeup to make Good Decisions.
 - Economic Thresholds
 - Insecticide Selection
 - Timing of Applications
 - Evaluation of Sprays
 - Detection of Potential Problems
 - Insects/Weeds/Fertility/
 - PGRs/Diseases/etc.

2023 Scout Schools

Tifton: June 5th

Midville: June 13th



Dr. Mike Toews, 2007

Pest Patrol (Insect Updates)

Growers and other users can subscribe for text message alerts when you post an update in two easy steps.

- Step one:** Register online at www.syngentapestpatrol.com or register via text message by texting the corresponding short code word listed in the chart below to **97063**.
- Step two:** reply to the confirmation text they receive by texting the letter “y”, to complete their registration.

Entomologist	University or Region	Short Code Word
Phillip Roberts	University of Georgia	pestpat10
Jeremy Greene	Clemson University	pestpat7
Scott Graham	Auburn University	pestpat11

County Agent Newsletters

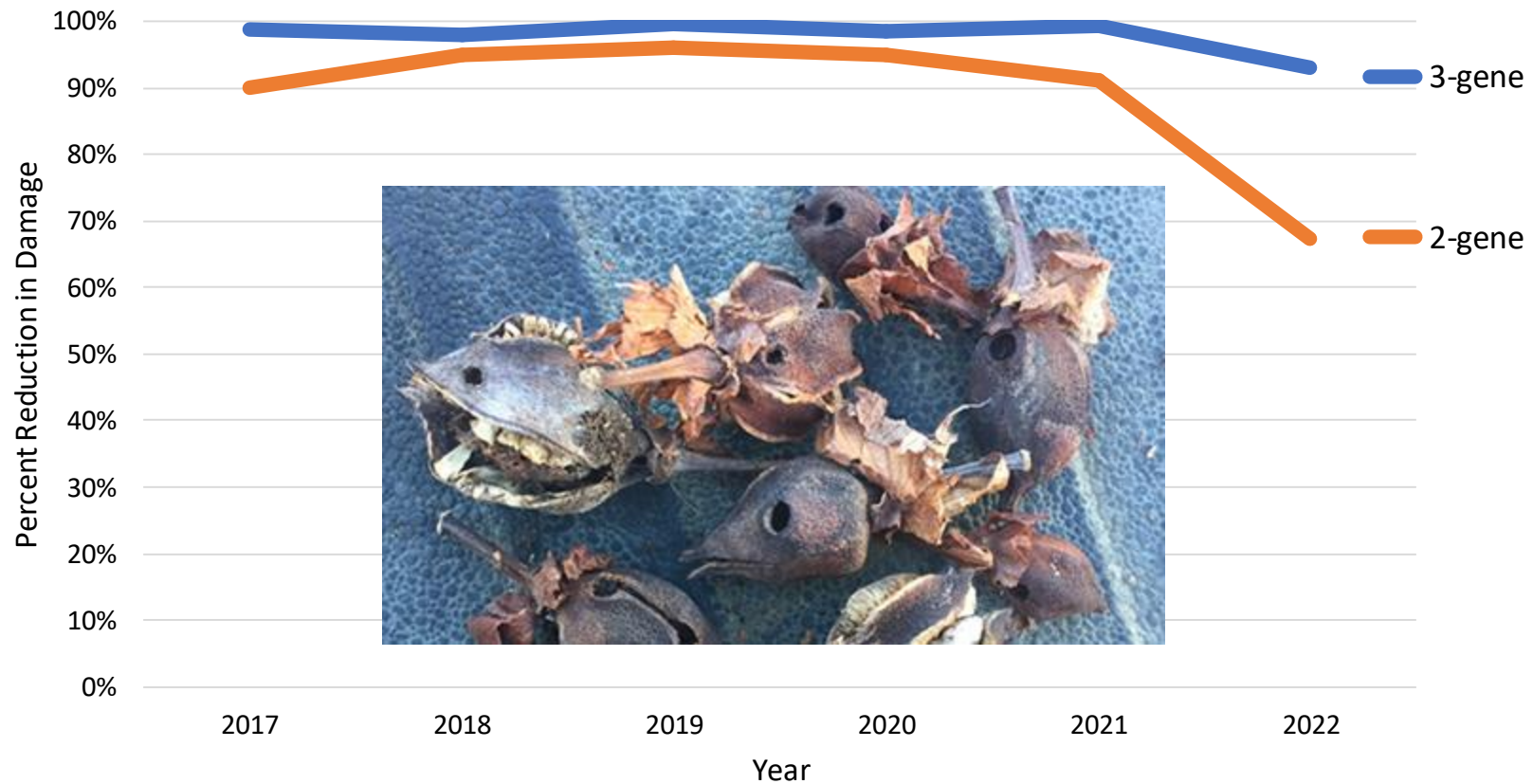
UGA Cotton Team Newsletter (<http://www.ugacotton.com>)

Corn Earworm Concerns



- Bt Cottons
 - Especially 2-gene
 - 3-gene
- Pyrethroid Susceptibility
- Low CEW infestations in recent years.

Georgia (Midville/Plains/Tifton) Mean: 2017-2022



Year-end Lep Damage

Problem Field 2022



Problem Field 2022



Problem Field 2022



Problem Field 2022

- Lab bioassays suggested CEW population was still susceptible.
- My opinion, there was a problem with expression or production of the toxin.
- A similar observation was made in two fields in Louisiana a couple of years ago.
- Bottom line is that BG3 is not bulletproof.
- Annual collections of CEW and TBW important.
- If you have a problem, call County Agent ASAP.
 - Need to quantify injury and collect larvae for bioassay.

Bt Cottons are not IMMUNE to caterpillar pests!

IPM principles and practices are needed and provide value to the grower!

Bt Traits	TBW Tobacco Budworm	CEW Corn Earworm
Bollgard 3 (Cry1Ac+Cry2Ab+Vip3A)	+++	+++
TwinLink Plus (Cry1Ab+Cry2Ae+Vip3A)	+++	+++
WideStrike 3 (Cry1Ac+Cry1F+Vip3A)	+++	+++
Bollgard II (Cry1Ac+Cry2Ab)	+++	++·
TwinLink (Cry1Ab+Cry2Ae)	+++	++·
WideStrike (Cry1Ac+Cry1F)	+++	+

o=no activity, +++=very good

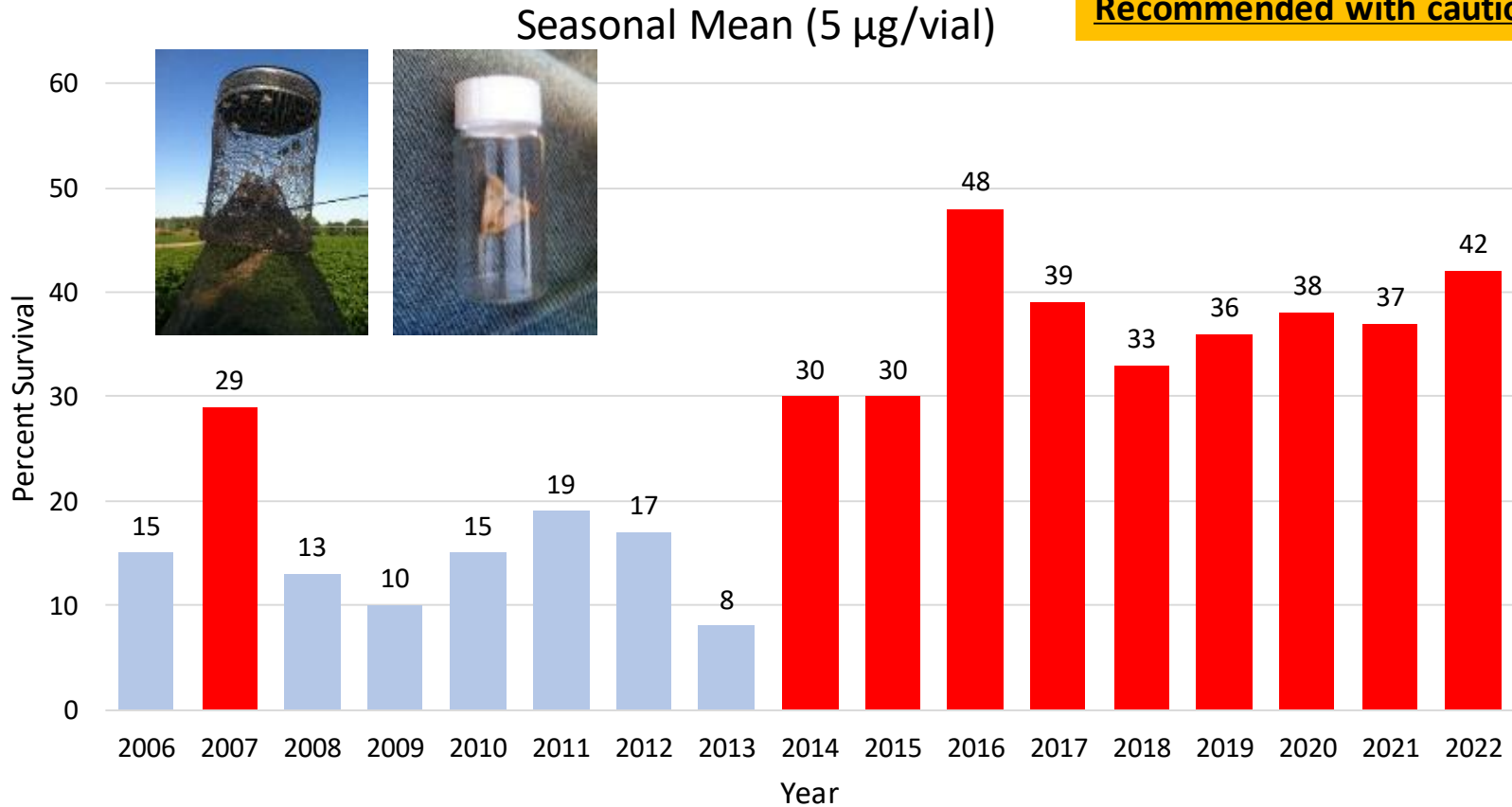
3-gene Bt Cotton (July 2022)



CEW Pyrethroid Susceptibility

Georgia 2006-2022

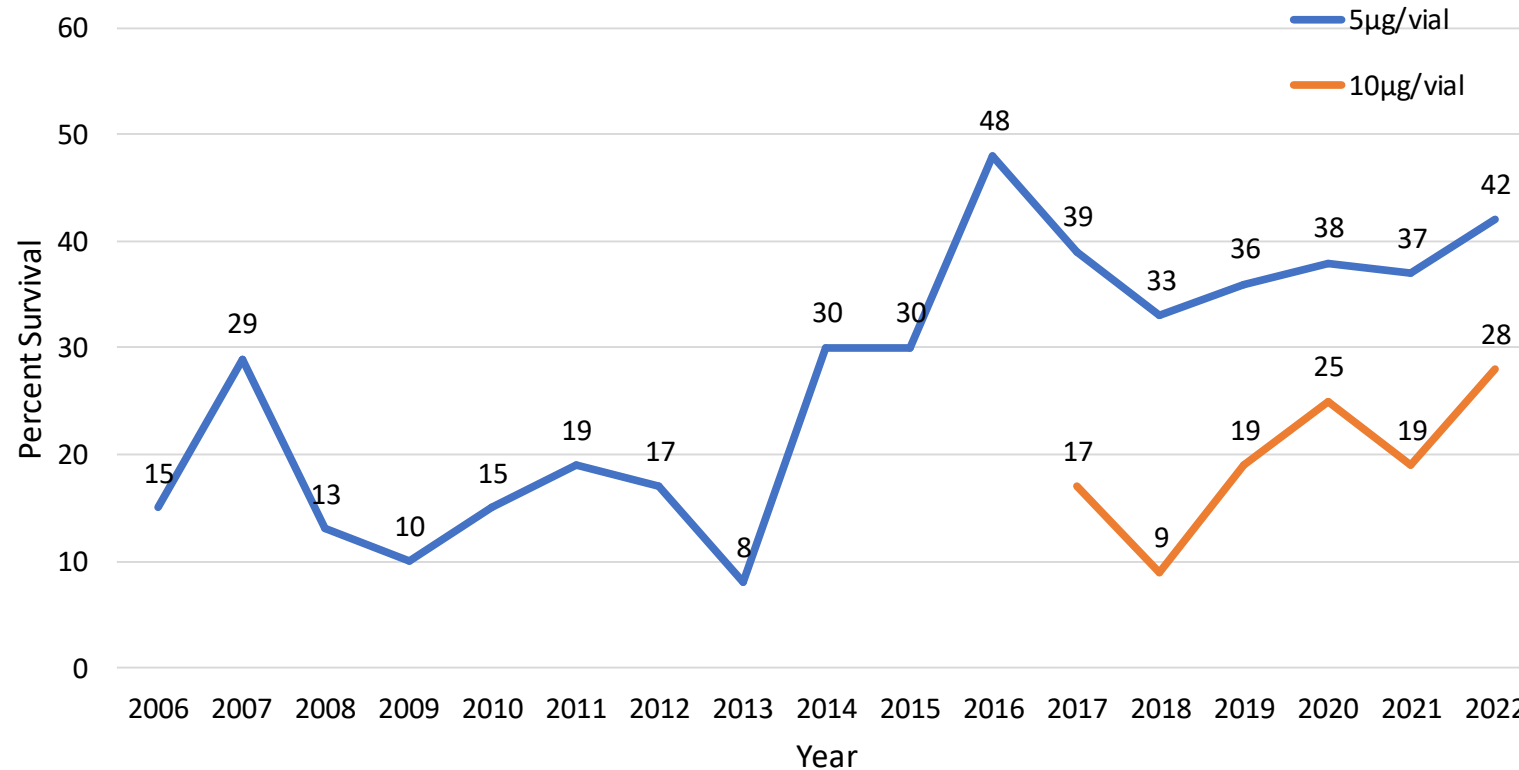
**Please contact County Agent
if field control issue!
Recommended with caution.**



CEW AVT

Tift County Georgia 2006-2022 (Seasonal Mean)

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Recommended with caution.**

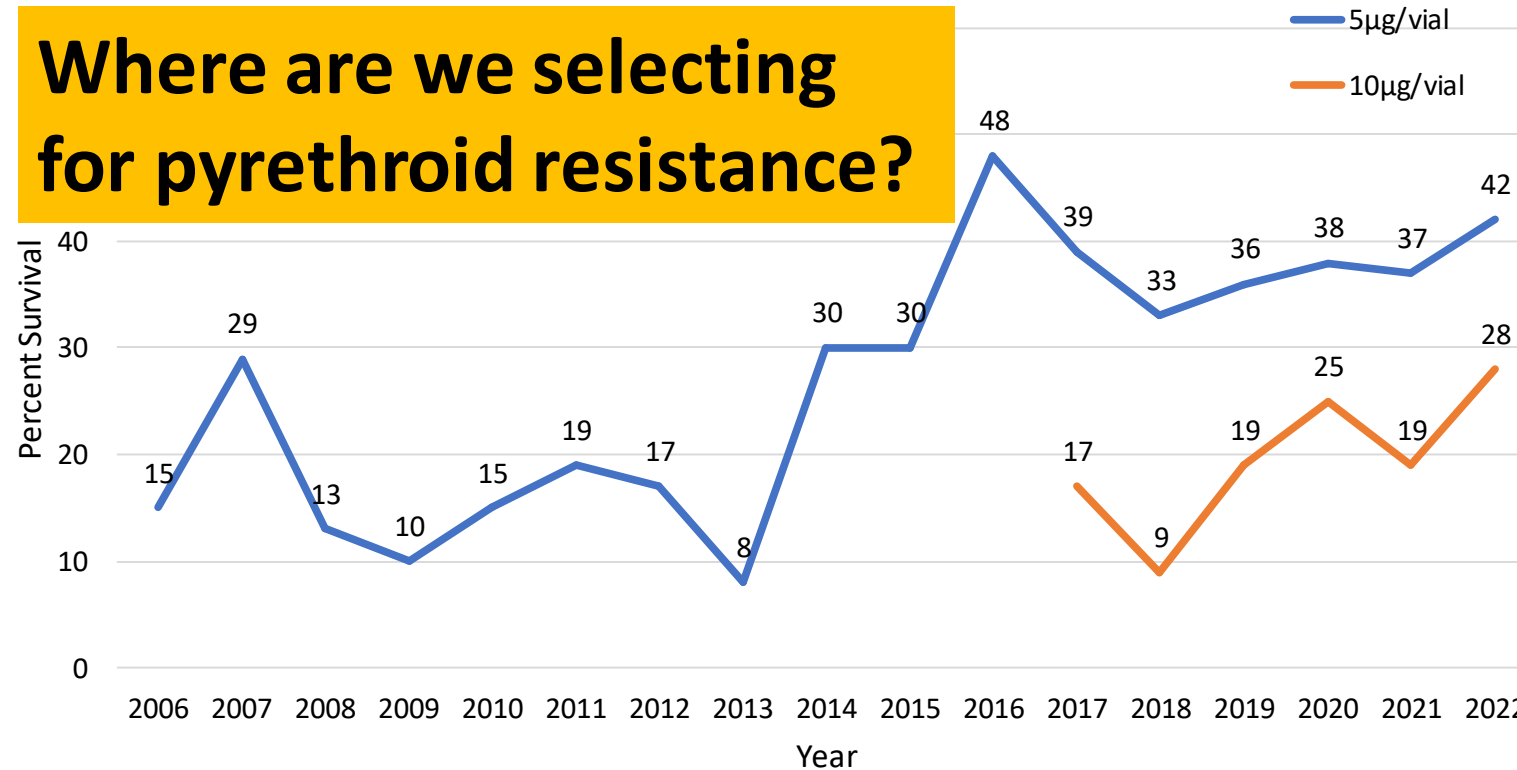


CEW AVT

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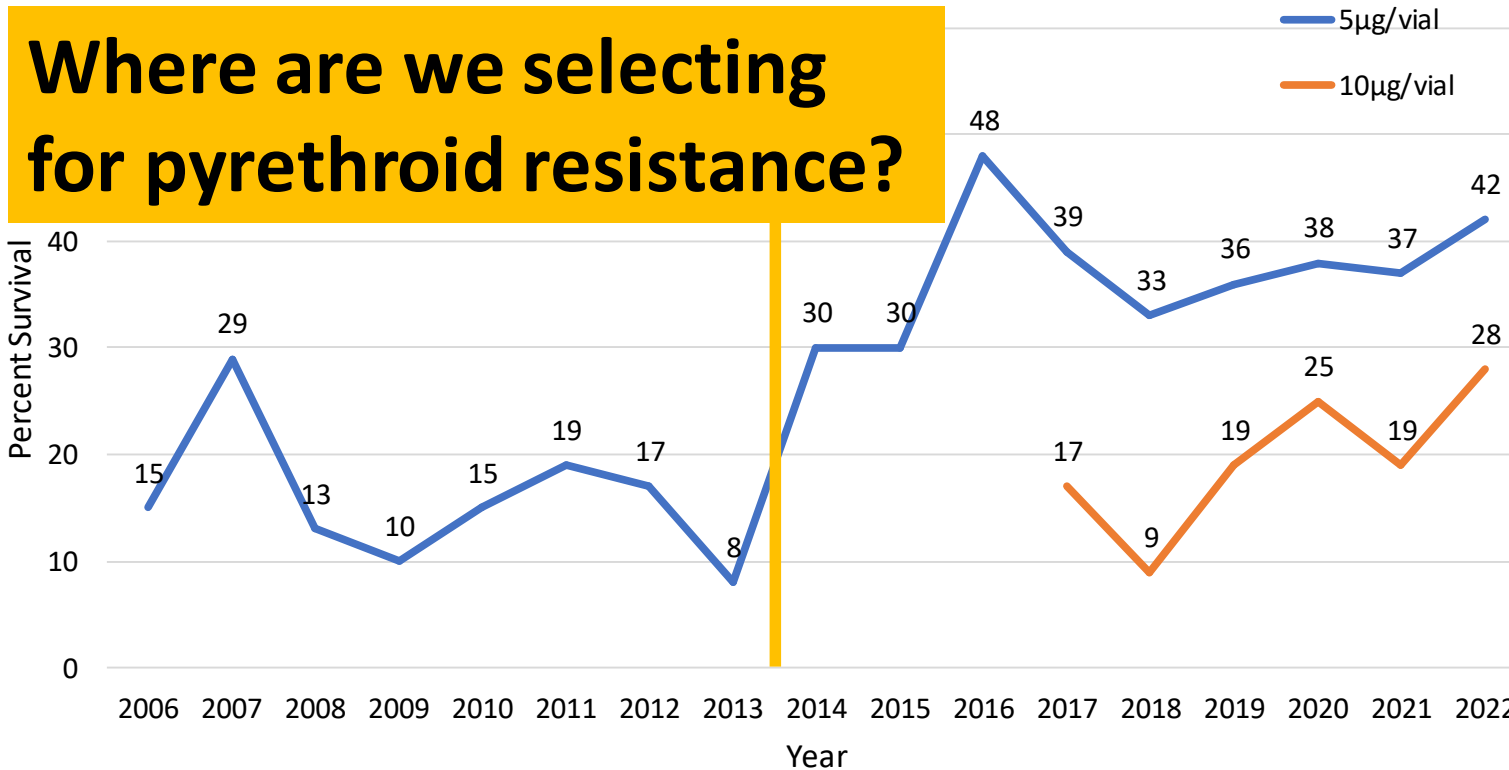
**Where are we selecting
for pyrethroid resistance?**



CEW AVT

Tift County Georgia 2006-2022 (Seasonal Mean)

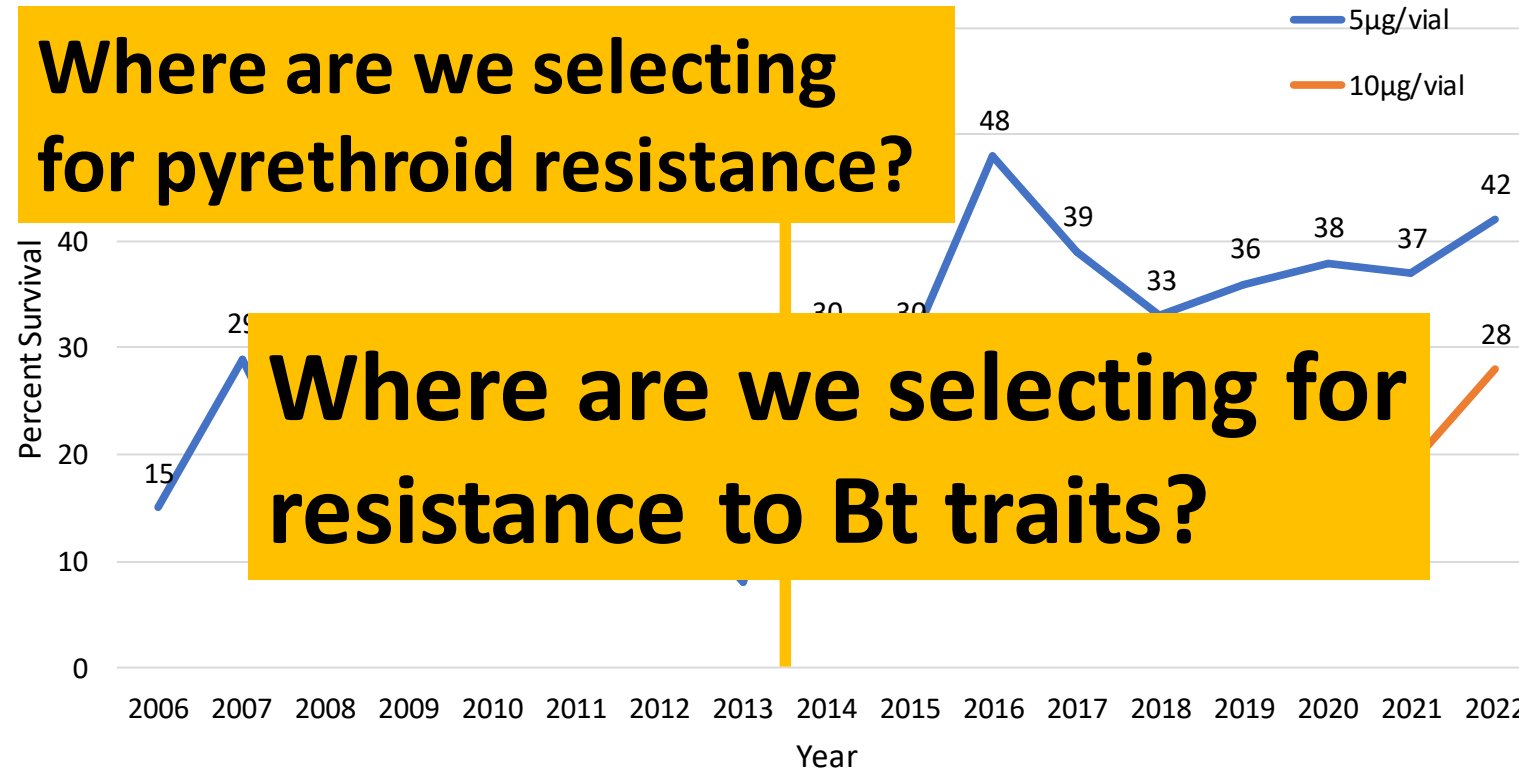
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CEW AVT

Tift County Georgia 2006-2022 (Seasonal Mean)

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Non-Pyrethroid Alternatives for Corn Earworm Control

- Must have high infestations to observe resistance issues in the field (Bt cottons/pyrethroids).
- Coverage and penetration of the canopy with insecticide is critical for success.

Bollworm/ Tobacco Budworm	NON-PYRETHROIDS					On non-Bt cotton apply when 8 small larvae are found per 100 terminals prior to first insecticide treatment, or when 5 larvae are found after first spray. Due to the threat of pyrethroid resistance, non-pyrethroid insecticides are recommended for control of tobacco budworm. Resistance management: Do not treat successive generations with insecticides that have the same mode of action. Bt cotton containing Bt genes are effective tools for use in bollworm and tobacco budworm management programs. Apply insecticide on Bt cotton when 8 larvae (¼" or greater in length) are found per 100 plants.
	Active Ingredient	Rate	Concentration	Application	Pre-harvest Interval	
	<i>indoxacarb</i> Steward 1.25EC	22	11.3 oz	0.11	12 H/ 14 D	
	<i>methomyl</i> Lannate 1V 2.4	1A	1.5–2 pt	0.45–0.6	72 H/ 15 D	
	<i>spinetoram</i> Radiant 1 SC	5	4.25–8 oz	0.0332–0.0625	4 H/ 28 D	
	<i>chlorantraniliprole</i> Vantacor 5SC	28	1.2–2.5 oz	0.077–0.098	4 H/ 21 D	
	<i>spinosad</i> Blackhawk	5	2.4–3.2 oz	0.054–0.072	4 H/ 28 D	

Corn Earworm Concerns

- Corn
 - Pyrethroid selection
 - Bt selection
- If CEW populations low we will not see the problem.
- Why are CEW populations Low?
 - Cotton Corn Ratio
 - Plant Bugs
 - Conserve Beneficial Insects!
 - Only spray when thresholds exceeded.



Tarnished Plant Bug Thresholds

- **UGA Threshold (Square Retention):** Apply when plants are retaining less than **80%** of pinhead squares and numerous plant bugs are observed.
- **Sweep Net/Drop Cloth Thresholds**
 - **First 2 weeks of squaring:**
 - 8 bugs/100 sweeps – 1 bug / 6 row feet
 - **Third week of squaring through bloom:**
 - 15 bugs/100 sweeps – 3 bugs / 6 row feet





Bollgard³
ThryvON™
With XTENDFLEX
TECHNOLOGY



- New Bt trait under development by Bayer
 - *Bacillus thuringiensis* (Bt) Cry51Aa2.834_16 toxin expressed in MON 88702 cotton
 - No activity on caterpillar pests
 - No apparent activity on stink bugs
 - Tarnished Plant Bug
 - Not immune, but reduces needed sprays
 - Slows development, some mortality of small nymphs
 - Thrips (*Frankliniella fusca*)
 - Minimal toxicity
 - Avoidance
 - Ovipositional deterrent
- Stewarded: seed not approved for export

High Thrips Injury Potential

Planted April 1, 2023 (Tift County GA)



No Foliar



Orthene 1-Leaf

Gaicho Seed Treatment

Threshold: 2-3 thrips per plant and immatures present.



No Foliar



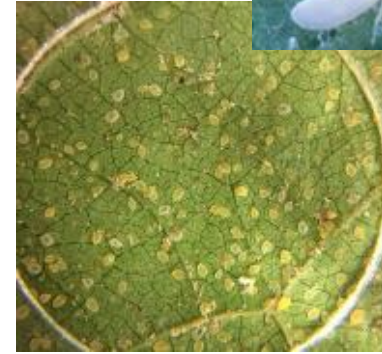
Orthene 1-Leaf

ThryvOn+ Gaicho Seed Treatment

Supplemental foliar sprays based on plant injury ,NOT thrips counts

Stewarded: seed not approved for export

SLWF Damage on Cotton



- YIELD

- Removing plant sap
 - General leaf decline
 - Reduced plant vigor
 - Reduced plant growth
 - Premature defoliation
 - Bolls do not properly mature
 - Compounded by other stresses
 - *Timing of infestation (stress)*
 - *Duration of control required*



- QUALITY

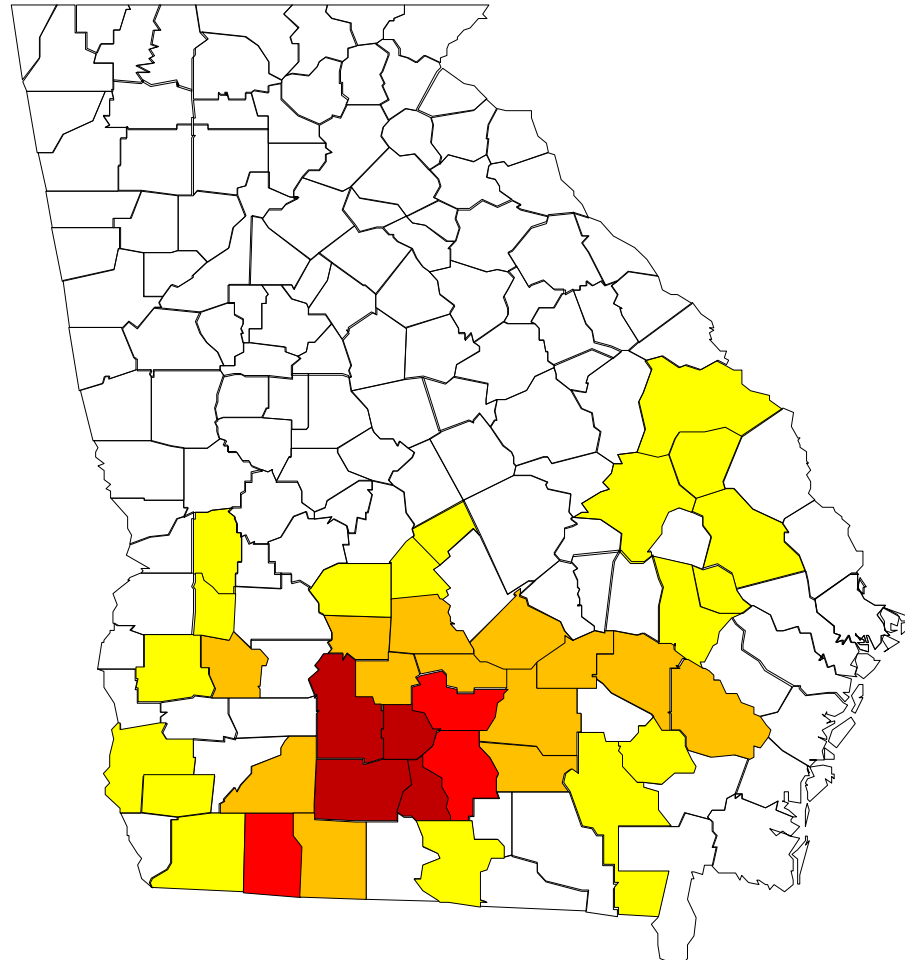
- Honeydew
 - Accumulation on lint
 - Sooty molds
 - Sticky Cotton
 - (potential spinning problems)

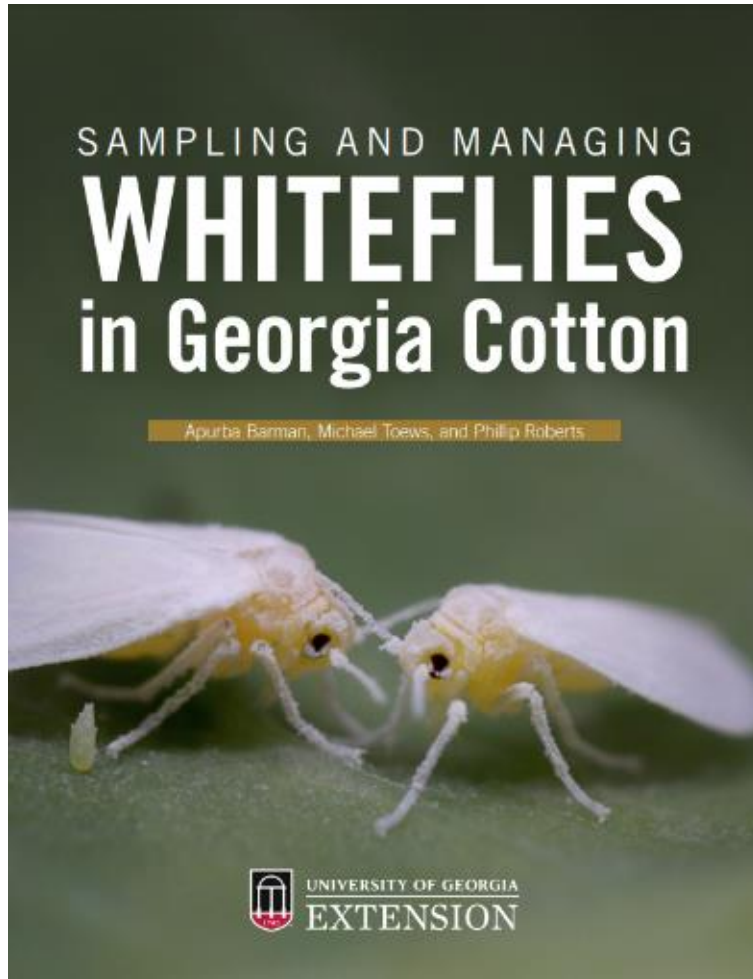


Silverleaf Whitefly in Cotton

Week ending September 2, 2022 (includes previous reports)

- No SLWF
- Low levels present
- Few fields treated (<10%)
- Moderate number fields treated (11-50%)
- Many fields treated (>50%)





<https://extension.uga.edu/publications/detail.html?number=C1184>

Cross-Commodity Management of Silverleaf Whitefly in Georgia

Alton Sparks, Phillip Roberts, Apurba Barman, David Riley, and Mike Toews

The silverleaf whitefly (SLWF), *Bemisia tabaci*, is an economic pest of numerous crops in Georgia, including cotton and a wide variety of vegetables. Also known as the sweet potato whitefly, immature and adult SLWF (Figure 1) have piercing, sucking mouthparts and damage crops by feeding within vascular tissues and removing plant sap. As they feed, SLWF excrete honeydew, a sticky, sugary solution that accumulates on plants and serves as a food source for sooty mold. Honeydew can cover the plant and block sunlight, resulting in reduced photosynthesis. In cotton, the accumulation of honeydew on lint can have negative impacts on fiber quality and spinning efficiency at mills. In some vegetable crops, SLWF is a vector of viral diseases that can decimate fields, particularly in the fall.


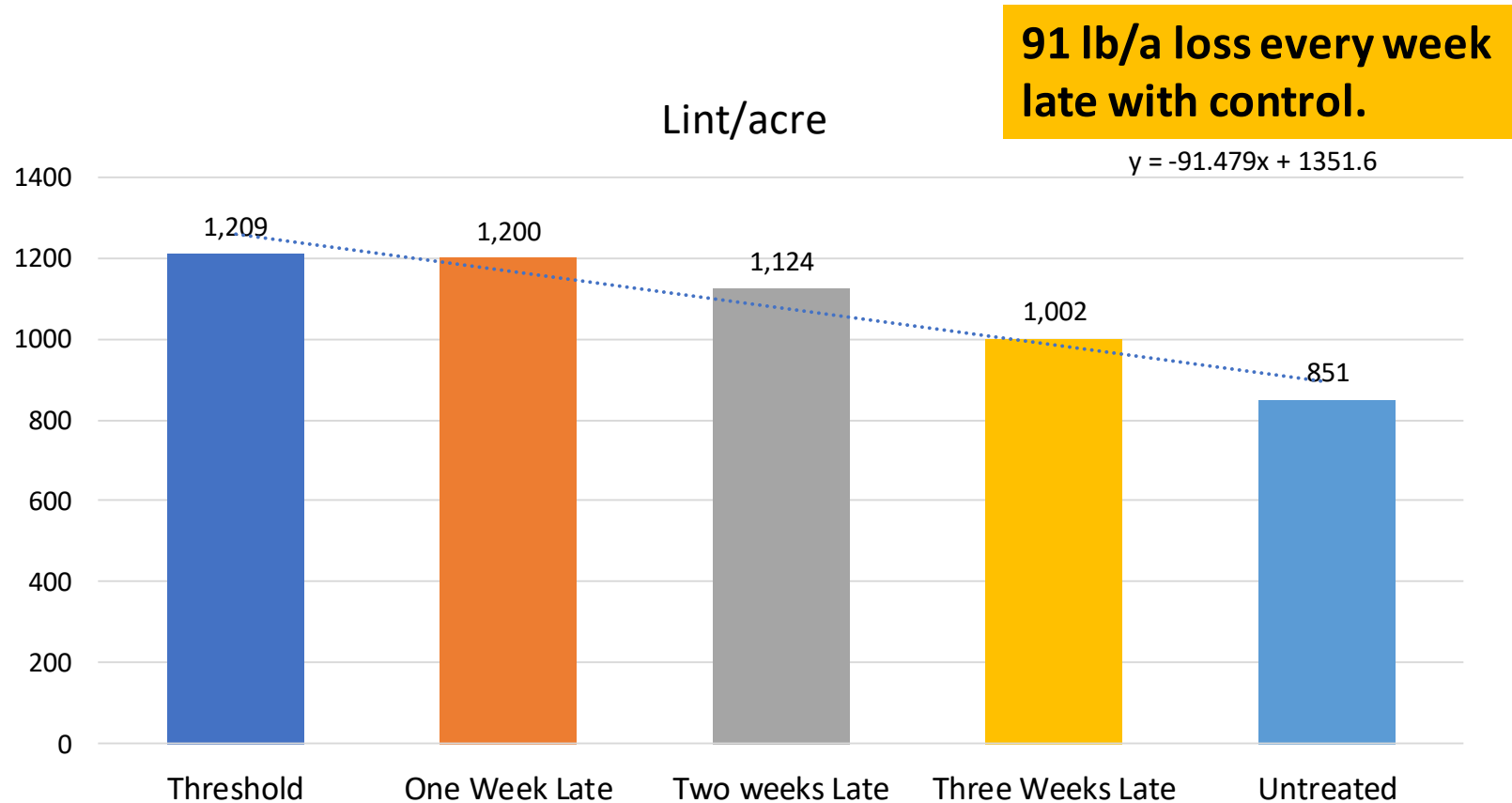


Figure 1. The silverleaf whitefly in immature (left) and adult (right) stages.

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<https://extension.uga.edu/publications/detail.html?number=C1141>

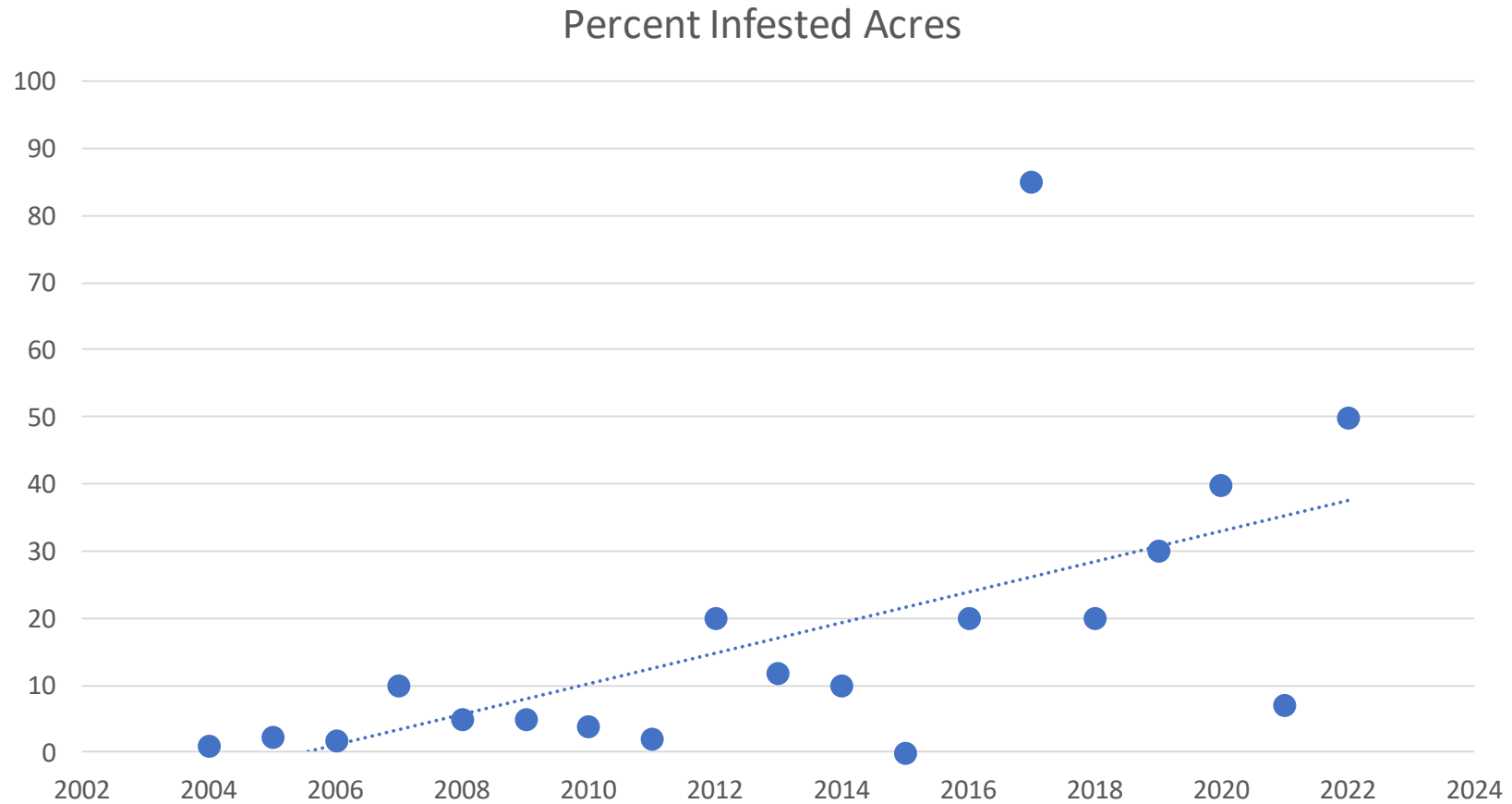
Phenological Susceptibility of Cotton to SLWF 2017-2022 (8 trials above threshold)



Time Aggressive Control Initiated (Sivanto 14 ozs/acre)
Goal was too eliminate SLWF for remainder of season, weekly sprays.

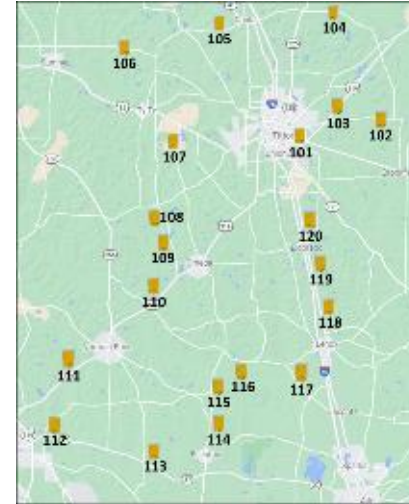
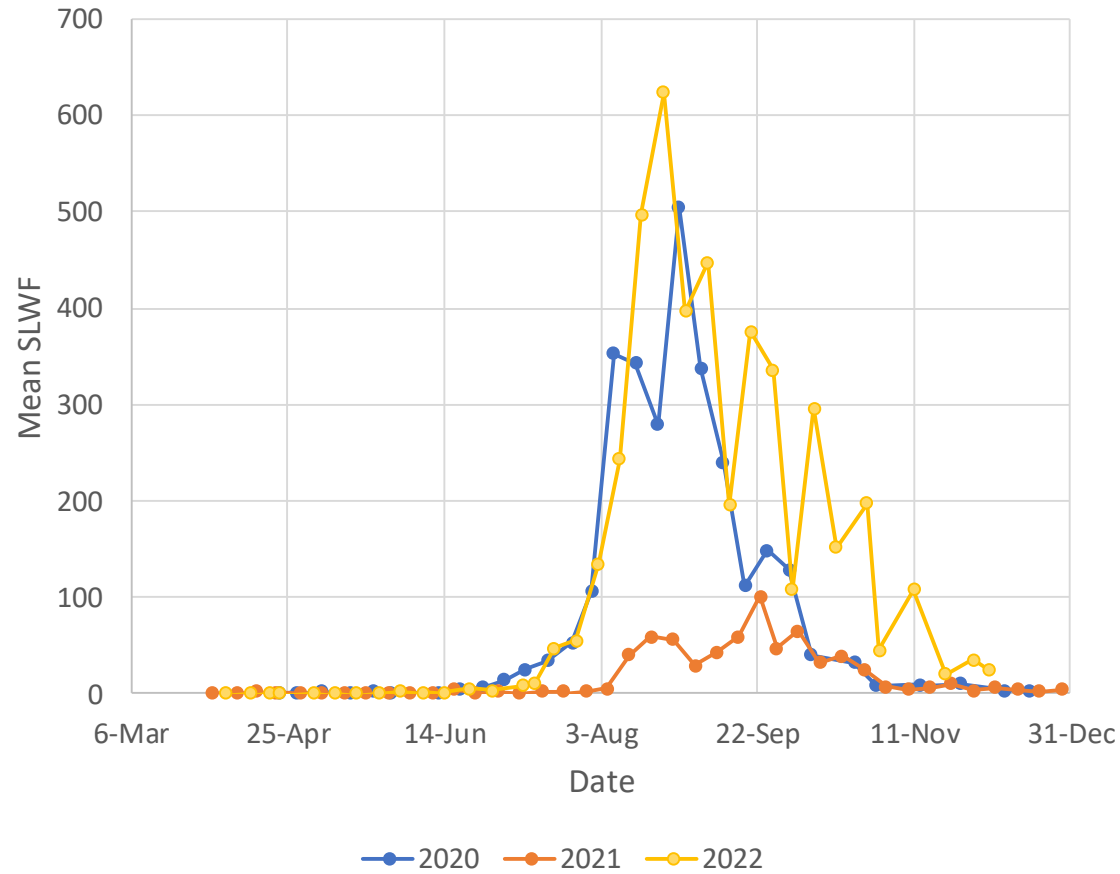
Silverleaf Whitefly

Georgia 2004-2022

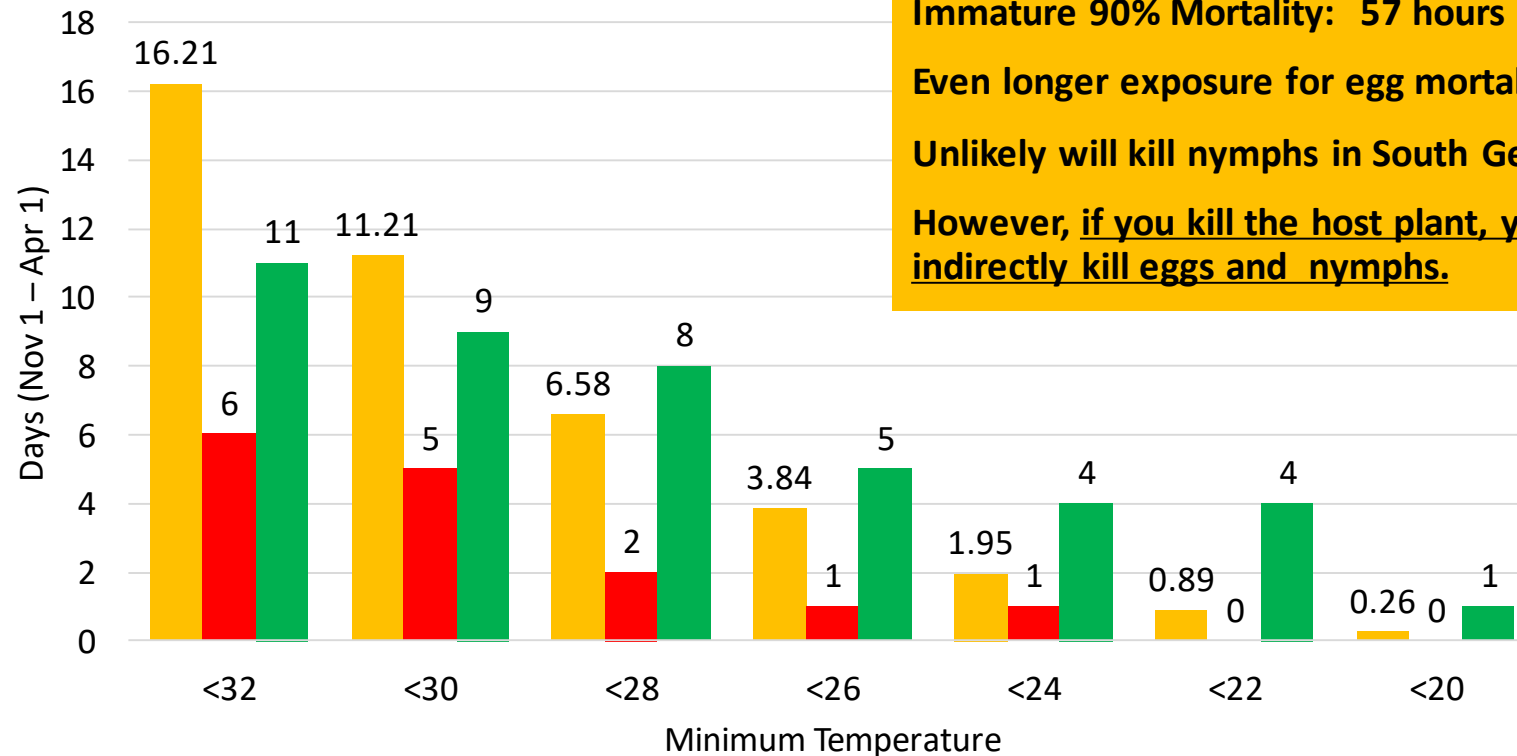


SLWF Sticky Card Captures

Georgia 2020-2022



SLWF and Winter Mortality

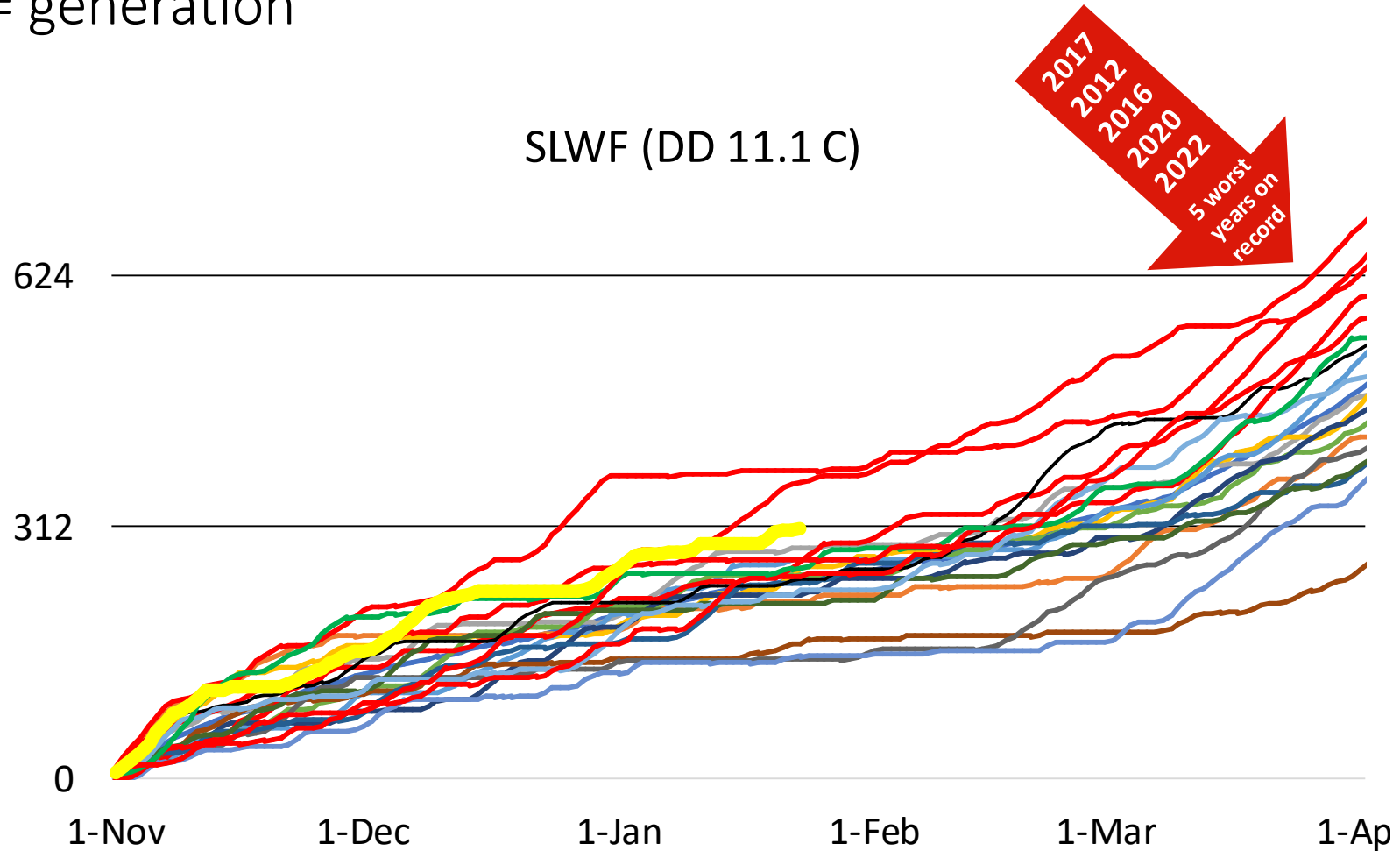


Adult 90% Mortality: 3 hours 21°F
Immature 90% Mortality: 57 hours of 21°F
Even longer exposure for egg mortality.
Unlikely will kill nymphs in South Georgia.
However, if you kill the host plant, you indirectly kill eggs and nymphs.

■ mean (2004-2022) ■ 2017 ■ 2023 as of Jan 17

11.1°C Degree Days (Nov 1 – Apr 1, Tifton)

312 DD = generation



11.1°C = 52°F

Manage RISK: Silverleaf Whitefly

Cotton	Low ← SLWF RISK → High			
Winter Weather	Very Cold		Mild	
Variety Selection	Smooth	Semi-Smooth	Light Hairy	Hairy
Planting Date	April	early May	late May	June
Location: (proximity to SLWF infested crops)	Isolated		Near	
Beneficial Insects	High	Moderate		None
Weather (in-season)	Rainy		Hot and Dry	
IPM	Scouting Threshold		Not Timely	
Irrigation	Irrigated		Drought Stress	



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