Insect Pest Management Update from 2021

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Southeast Regional Fruit & Vegetable Conference

Savannah, GA

2022

UNIVERSITY OF GEORGIA

CLEMSON UNIVERSITY

Outline

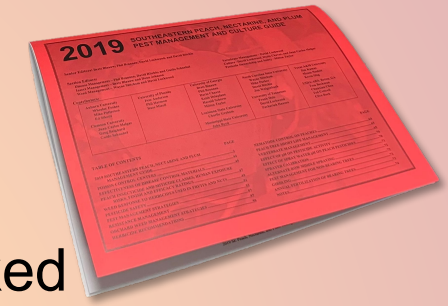
- Things to look forward to in 2022
  - New projects
  - Chlorpyrifos ban
- San Jose scale
  - Mating disruption
  - Within season, on farm oil sprays
- Oriental fruit moth
  - Potential new rotational products

Things to look forward to in 2022

Things to look forward to in 2022

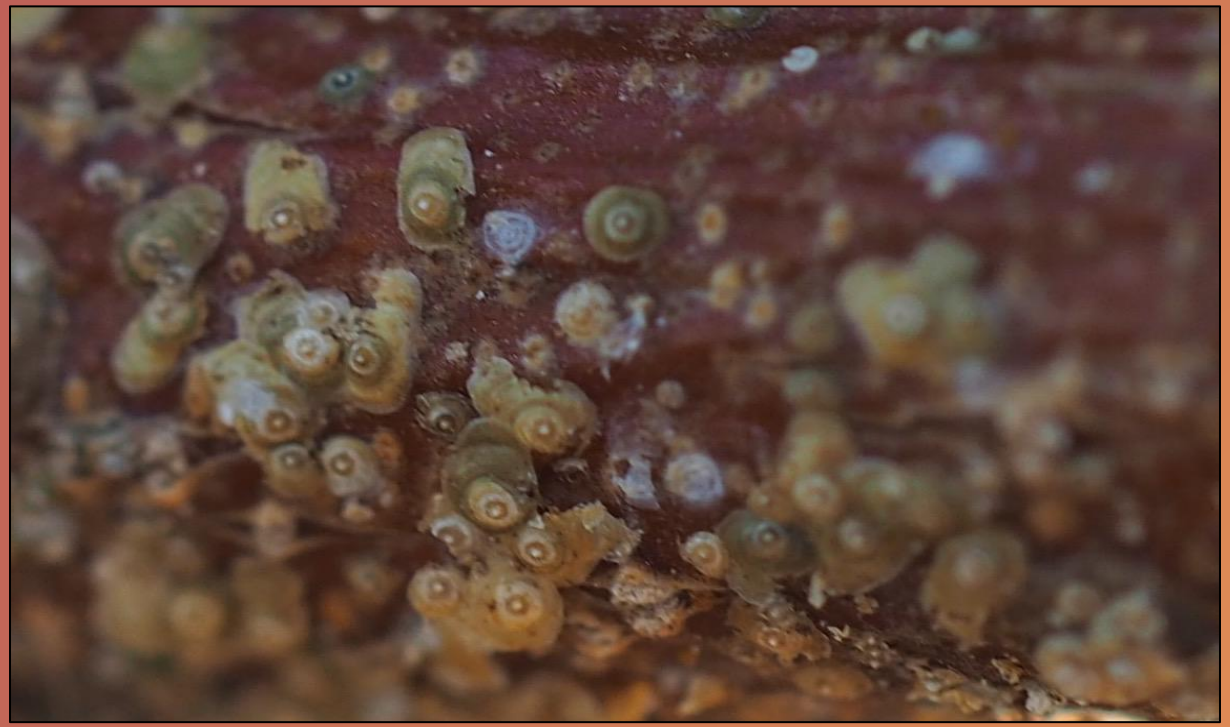
- New spray trial projects
  - Borer management
  - Thrips management
  - Heavier oils for scale
- Chlorpyrifos ban

Chlorpyrifos ban



- Starting March 1, 2022 **all tolerances** will be revoked
  - Registered food uses will be canceled
- Change in management practices
  - Borers
    - Asana XL (esfenvalerate), Rimon (novaluron), & Altacor (chlorantraniliprole)
    - Mating disruption
    - Entomopathogenic nematodes
  - Scale
    - Insect growth regulators like Centaur, Esteem, & Movento
    - Other options?
- 2022 peach guides have been updated

San Jose scale (SJS)



SJS mating disruption

Mating disruption trial design - 2021

Trial design:

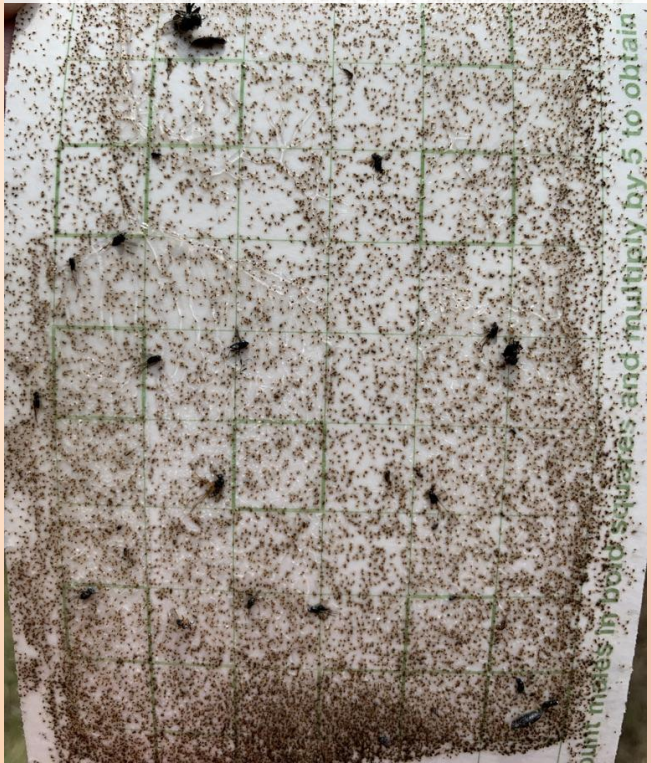
- ¼ acre blocks, 3 reps
- 3 experimental formulations evaluated
- Monitored adult males and crawlers through season

Treatment	Manufacturer	Rate/acre	Active Ingredient	Date deployed
UTC	x	x	x	x
Isomate	CBC America	200	Pheromone	Feb. 18
TRE 2462	Trécé	200	Pheromone	Feb. 12
TRE 2463	Trécé	100	Pheromone	Feb. 12

SJS male trapping

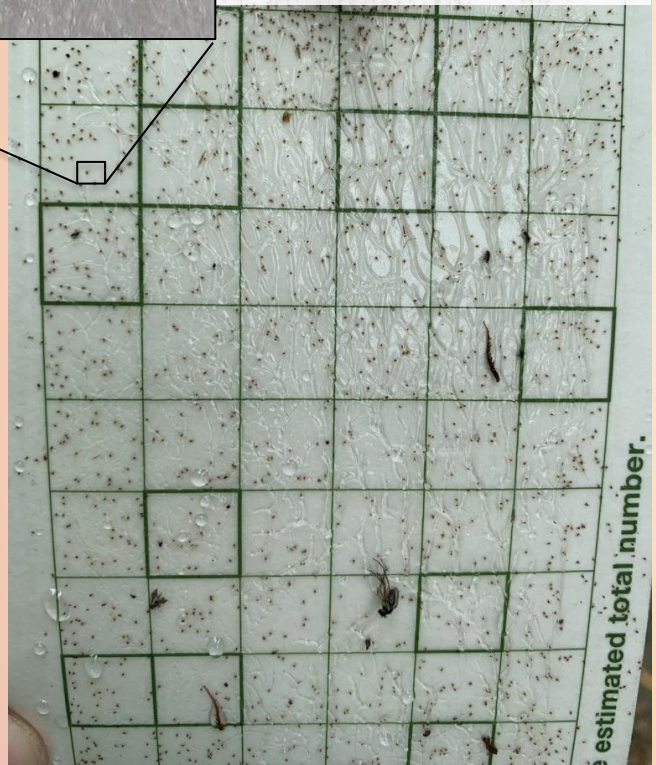
Mating disruption

Control

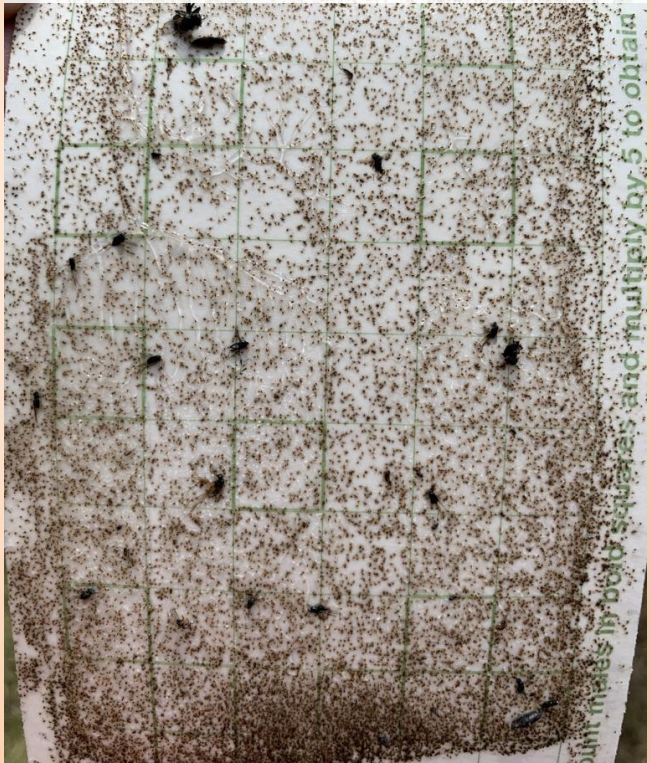


SJS male trapping

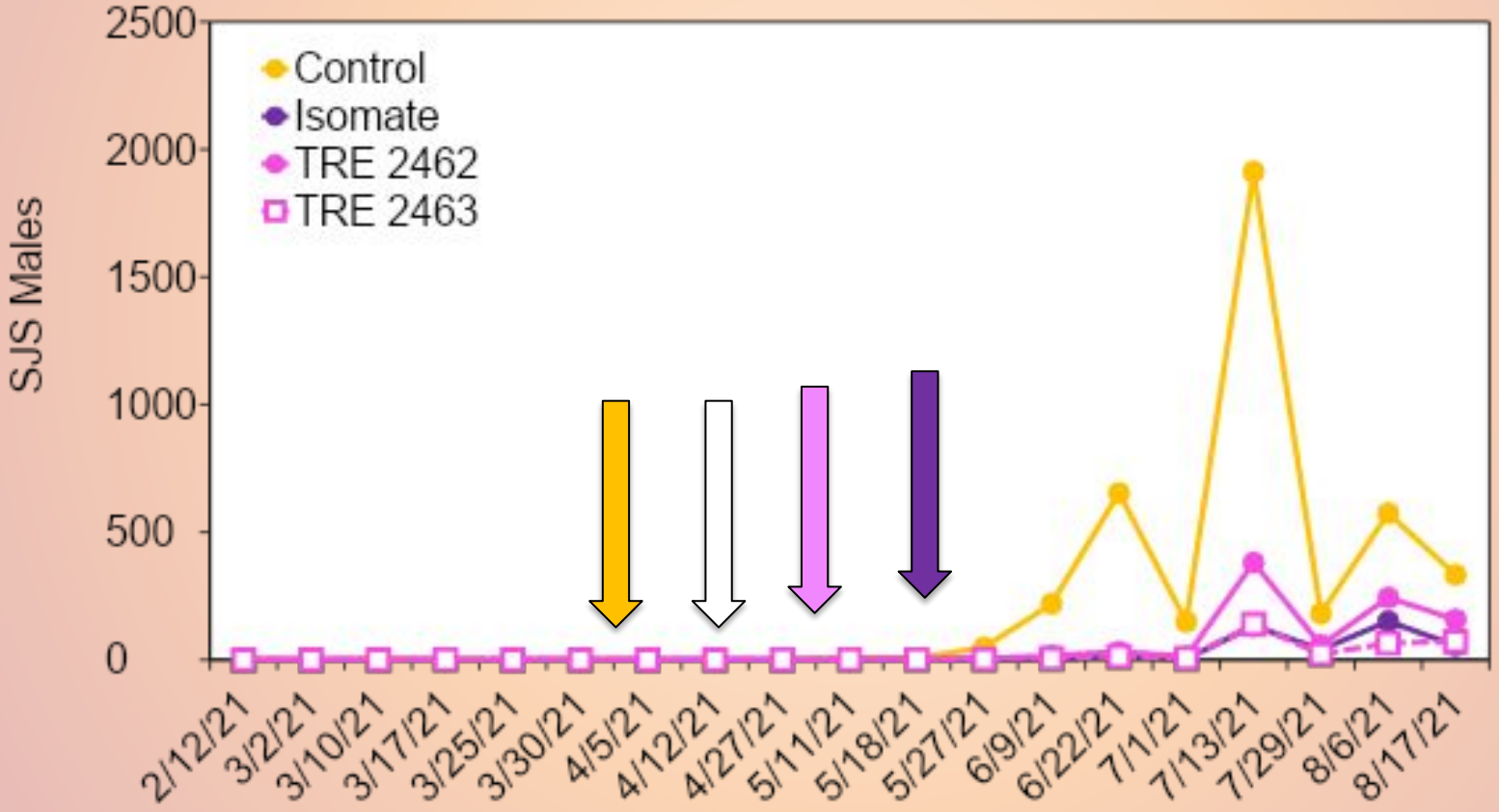
ng disruption



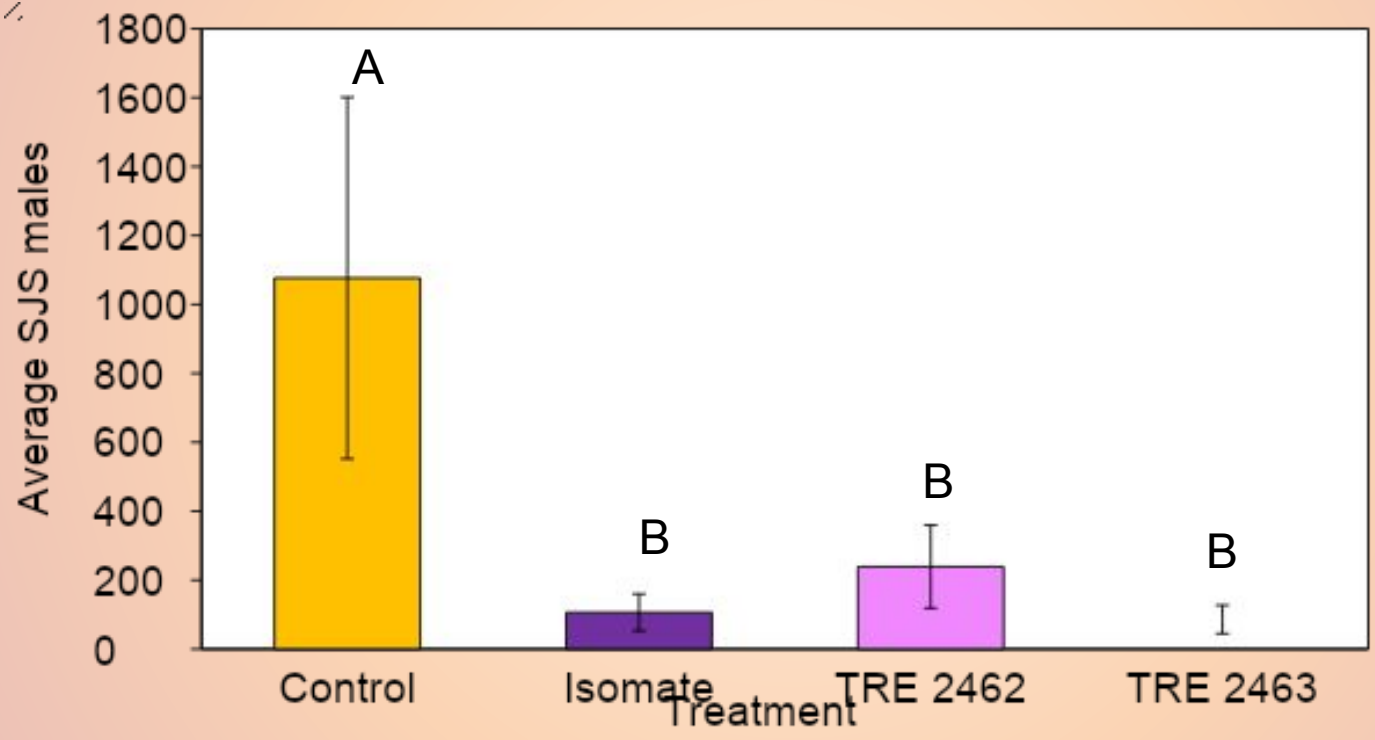
Control



SJS males: Seasonal activity



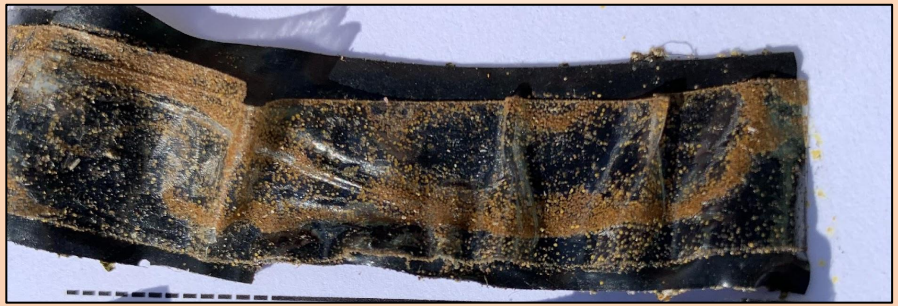
SJS Males: Season average



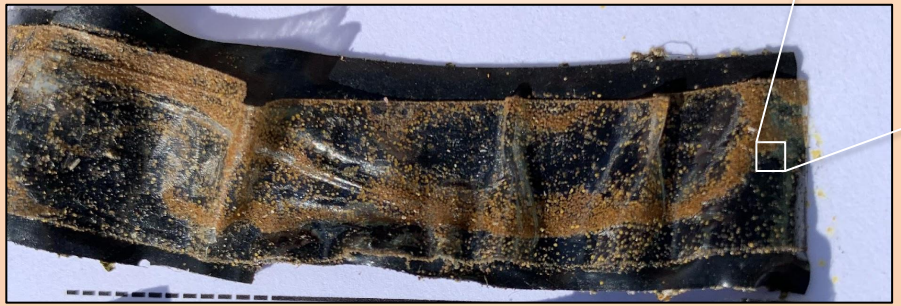
ANOVA $F_{3,224} = 3.02$, $P = 0.031$; Student's t

SJS crawler monitoring

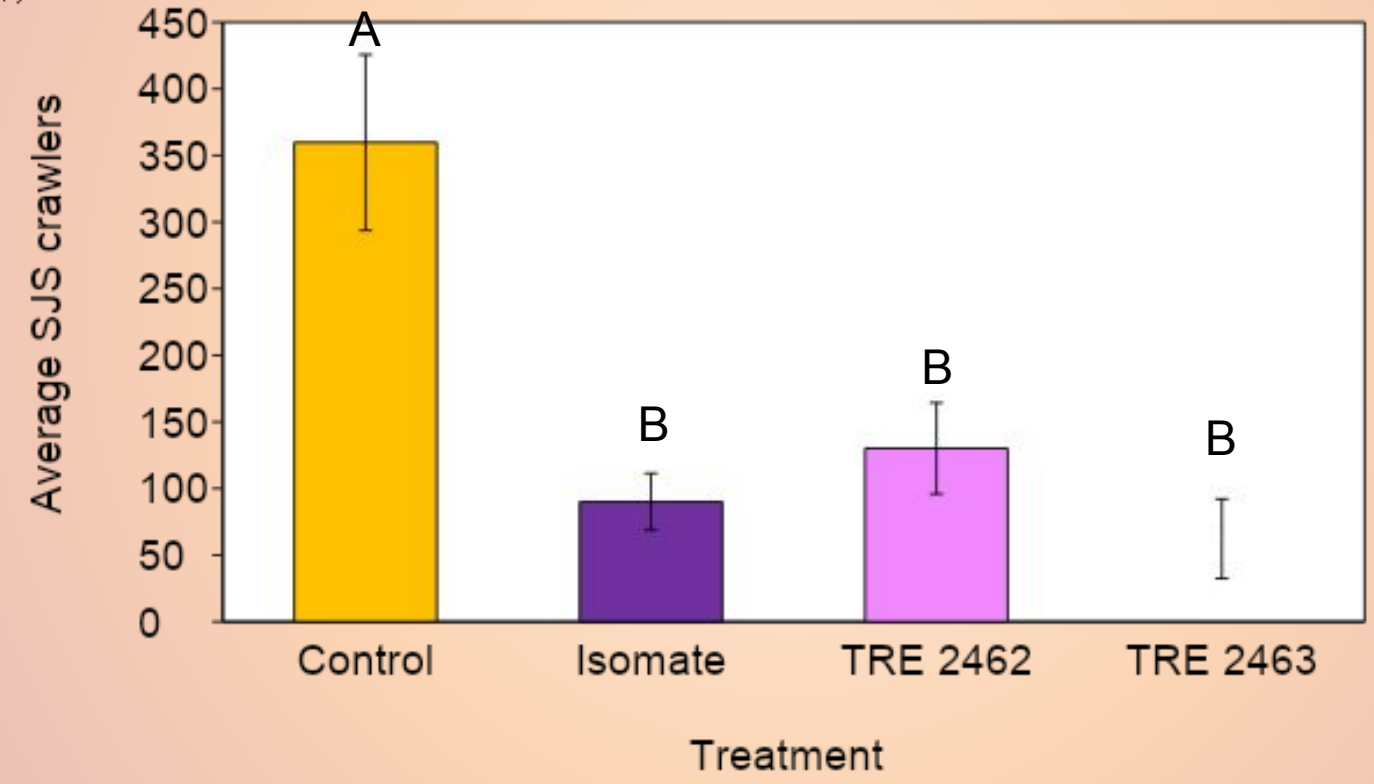
SJS crawler monitoring



SJS crawler monitoring



SJS crawlers: Early season



ANOVA $F_{3,172} = 10.99$, $P < 0.001$; Student's t

Within season, on farm oil sprays

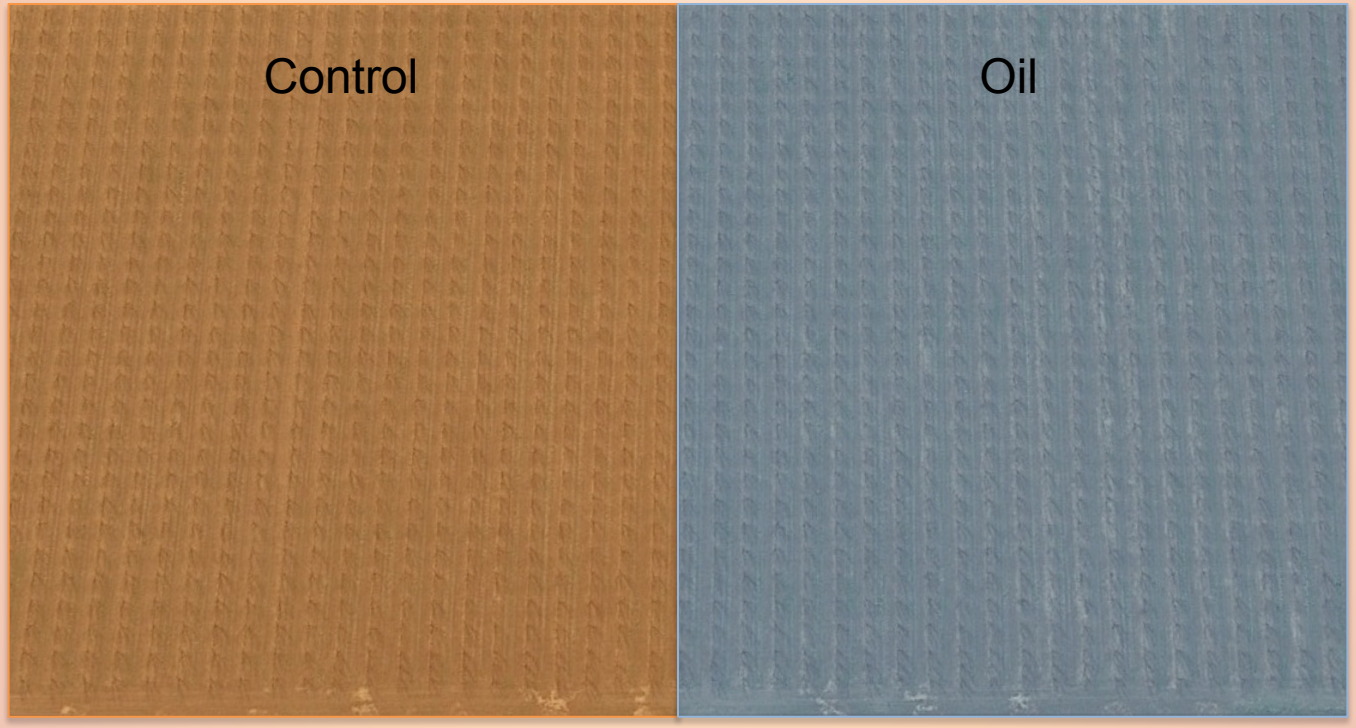
Within season, on farm oil spray trial - 2021

- Single orchard, Summer gold variety
- 0.2% Damoil added to standard spray program
- Airblast application
  - 5 weekly applications starting May 21
- Monitored SJS crawlers

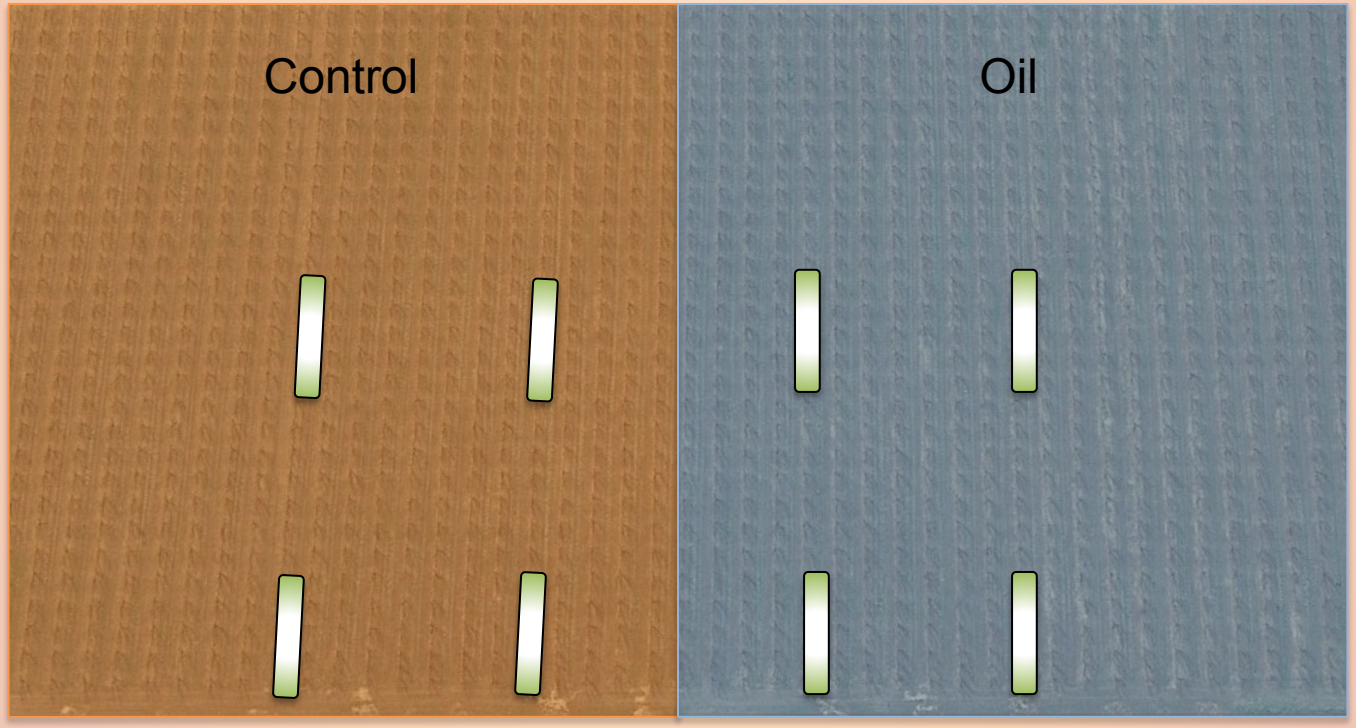
★ Note: Sulfur does not mix well with oil

Within season, on farm oil sprays

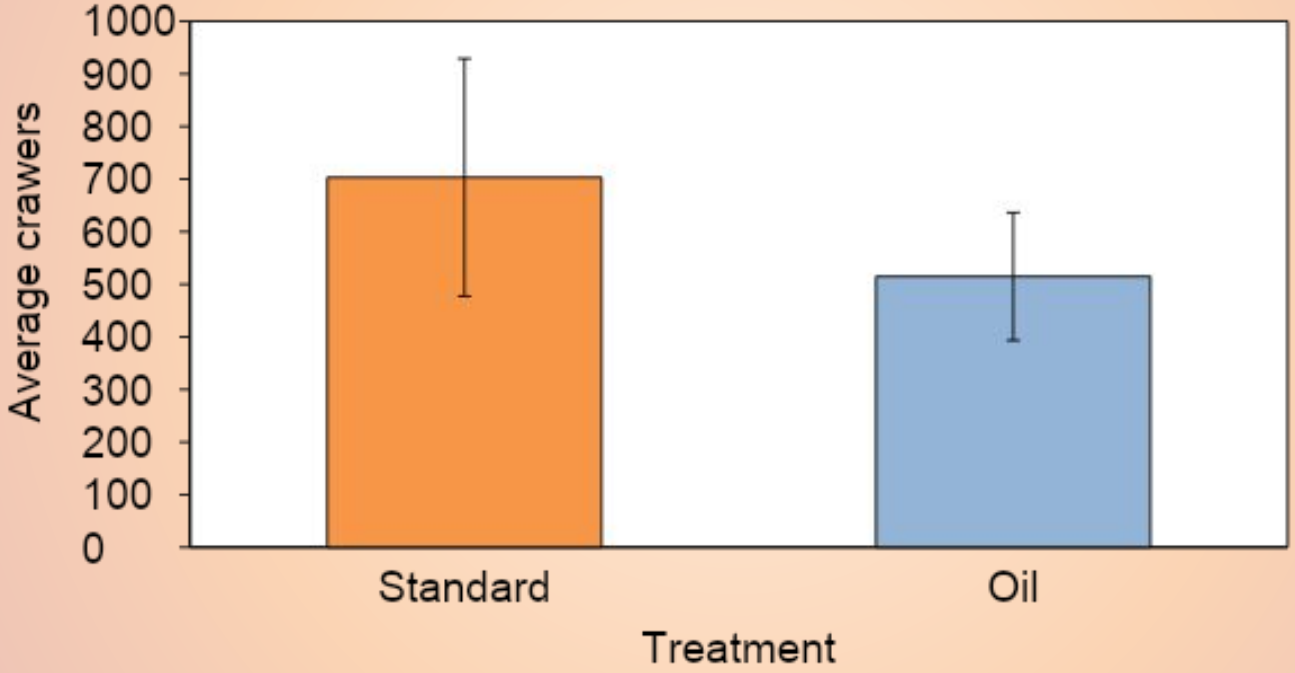
Within season, on farm oil sprays



Within season, on farm oil sprays



SJS crawler abundance



No phytotoxic issues!

Control

Oil

SJS Summary

- Dormant *oil* applications are critical
  - Coverage is still key timing and volume
  - Additional insecticides can improve management
    - Eg. Esteem, Centaur, Venerate
- Mating disruption is a promising alternative
  - Seems to work best in low to mid-range pressure
  - Still in experimental stage
- Within season low-rate oil sprays have potential
  - May take several years to see impact
  - Determine compatibility with captan

Oriental fruit moth (OFM)

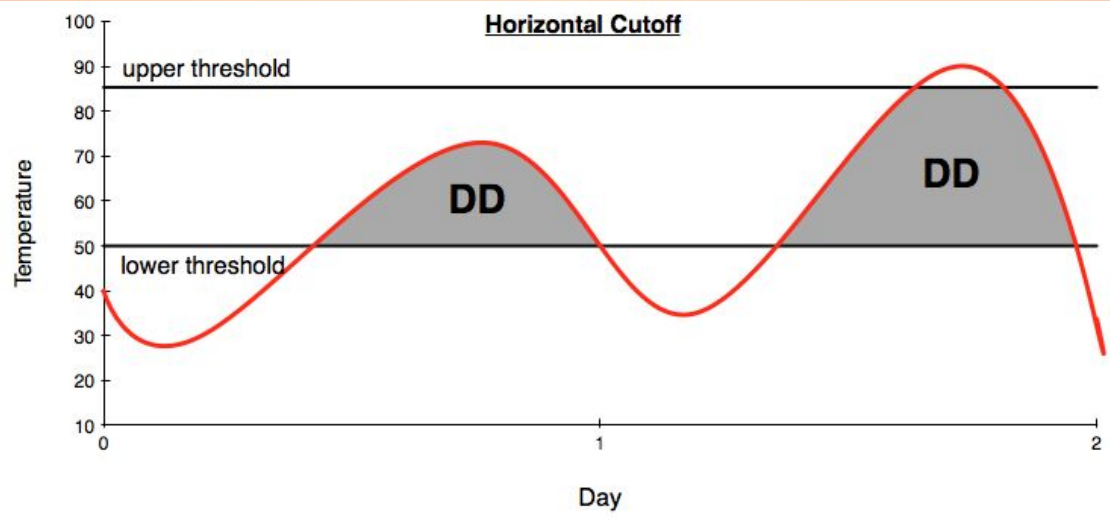
Oriental fruit moth (OFM)

- Generally, more of an issue in the upstate
- Adults emerge and mate shortly before bloom
  - Eggs hatch by mid- to late-April
  - Early-season insecticides for PC normally provide excellent OFM control
  - Cultivars ripening after June are more susceptible
- Management timing most effective based on growing degree-days and/or trapping

OFM mating disruption

- Mating disruption is an effective alternative
  - Several brands to choose from
- Works best on larger acreage (>5 ac)
  - Total orchard acreage must be ‘disrupted’
  - Deployed early spring prior to male flight
- A transition season may be needed
  - Combination of insecticide and mating disruption
- Monitor for flagging damage
  - Examine 20 shoots on 20 trees per block
  - Treat with insecticide if 1% or more of the shoots are infested or if fruit damage is detected

Calculating degree-days



$$GDD = \left[\frac{(\text{Max Temp} + \text{Min Temp})}{2}\right] - \text{Base Temp}$$

Start accumulating gdd at “biofix”

Date	Max Temp °F	Min Temp °F	Growing Degree-Day
6-Feb	48.1	39.8	-1.05
7-Feb	55.7	37.8	1.75
8-Feb	61.8	34	2.9
9-Feb	61.1	51.8	11.45
10-Feb	67	54.2	15.6
		Total	**30.65**

OFM chemical management

- Monitor with a pheromone trap to stay on top of problem
  - 1 trap per 10 acres
  - Treat if 10 moths/trap/week after 3rd cover
- Follow degree-day model
  - In the peach management guide
- Several good insecticides at our disposal
  - **Insecticide rotation is key**

Degree-day timing

Page 55 in peach management guide

RELATIONSHIP BETWEEN DEGREE-DAY ACCUMULATIONS AFTER BIOFIX* AND BIOLOGICAL EVENTS OF ORIENTAL FRUIT MOTH (45°F LOWER BASE, 90°F UPPER BASE)*	
Cumulative degree-days	**Biological Event**
175	first adult emergence
250	first eggs laid
325 to 425	peak adult emergence
525	peak egg laying
950	first emergence of second generation adults
1,100	first eggs laid by second generation
1,300 to 1,425	peak emergence of second generation adults
1,500	peak egg laying by second generation adults
1,900	first emergence of third generation adults
2,200 to 2,450	peak emergence of third generation adults
2,500	peak egg laying by third generation adults
* Modified from Michigan State University Fact Sheet	

*first sustained catch is defined as the Biofix for OFM

Generally recommended compounds

Trade Name	Active Ingredient	Effectiveness	MOA	IRAC
Imidan 70W	Phosmet	++++ (pH < 6.5)	Organophosphate	1B
Asana 0.66EC	Esfenvalerate	++++	Pyrethroid	3A
Baythroid XL 1EC	Beta cyfluthrin	++++	Pyrethroid	3A
Mustang Maxx	Zeta cypermethrin	++++	Pyrethroid	3A
Tombstone 2EC	Cyfluthrin	++++	Pyrethroid	3A
Proaxis 0.5EC	Gamma cyhalothrin	++++	Pyrethroid	3A
Warrior 1EC	Lambda cyhalothrin	++++	Pyrethroid	3A
Entrust	Spinosad	++	Spinosyn (organic)	5
Delegate WG	Spinetoram	+++	Spinosyn	5
Avaunt	Indoxacarb	++++	Oxadiazine	22A
Voliam Flexi	Thiamethoxam + Chlorantraniliprole	++++	Neonicotinoid + Diamide	4A + 28

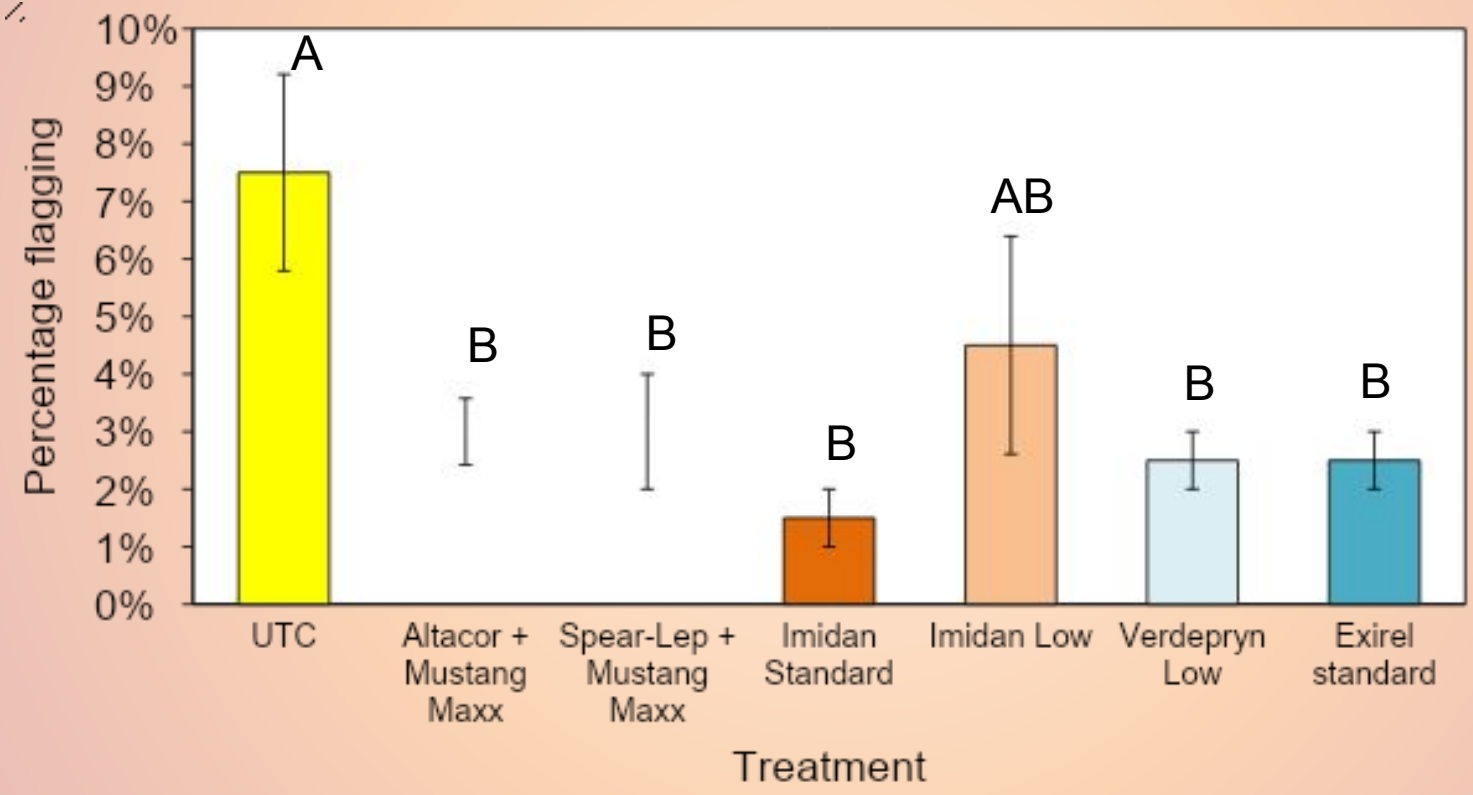
Potential rotational compounds trial - 2021

Treatment	Trade Name	Active Ingredient	Rate/acre	MOA	IRAC	Apps*	
1	Altacor	Chlorantraniliprole	4.5 oz	Diamide	28	x2	Rotated
	Mustang Maxx	Zeta cypermethrin	4 fl oz	Pyrethroid	3A	x2	
2	Spear-Lep	GS-omega/ kappa-Hxtx-Hv1a	1.5 pt	*Hv1a peptide*	32	x2	Rotated
	Mustang Maxx	Zeta cypermethrin	4 fl oz	Pyrethroid	3A	x2	
3	Imidan 70W (standard)	Phosmet	3 lb (pH < 6.5)	Organophosphate	1B	x4	
4	Imidan 70W (low)	Phosmet	1.5 lb (pH < 6.5)	Organophosphate	1B	x4	
5	Verdepryn (low)	Cyclaniliprole	8.2 fl oz	Diamide	28	x4	
6	Exirel	Cyantraniliprole	13.5 fl oz	Diamide	28	x4	

*Started April 9 and applied every two weeks

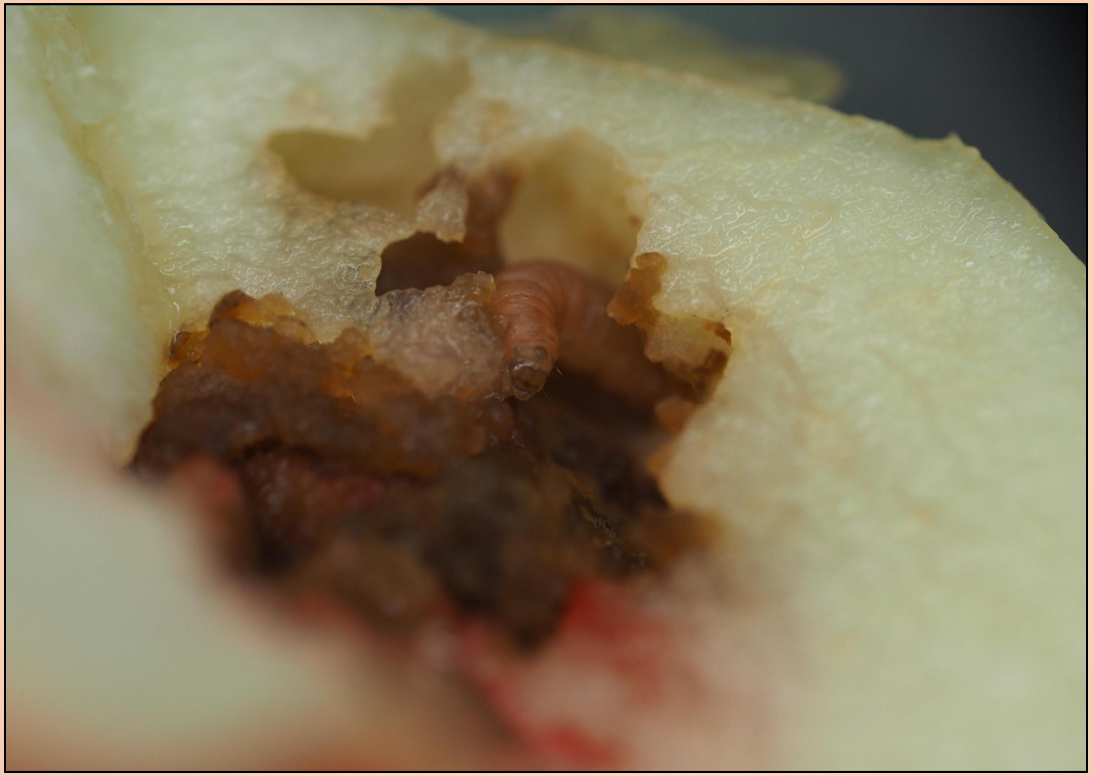
Flagging

Flagging



ANOVA $F_{6,21} = 3.19$, $P = 0.022$; Student's t

Fruit infestation



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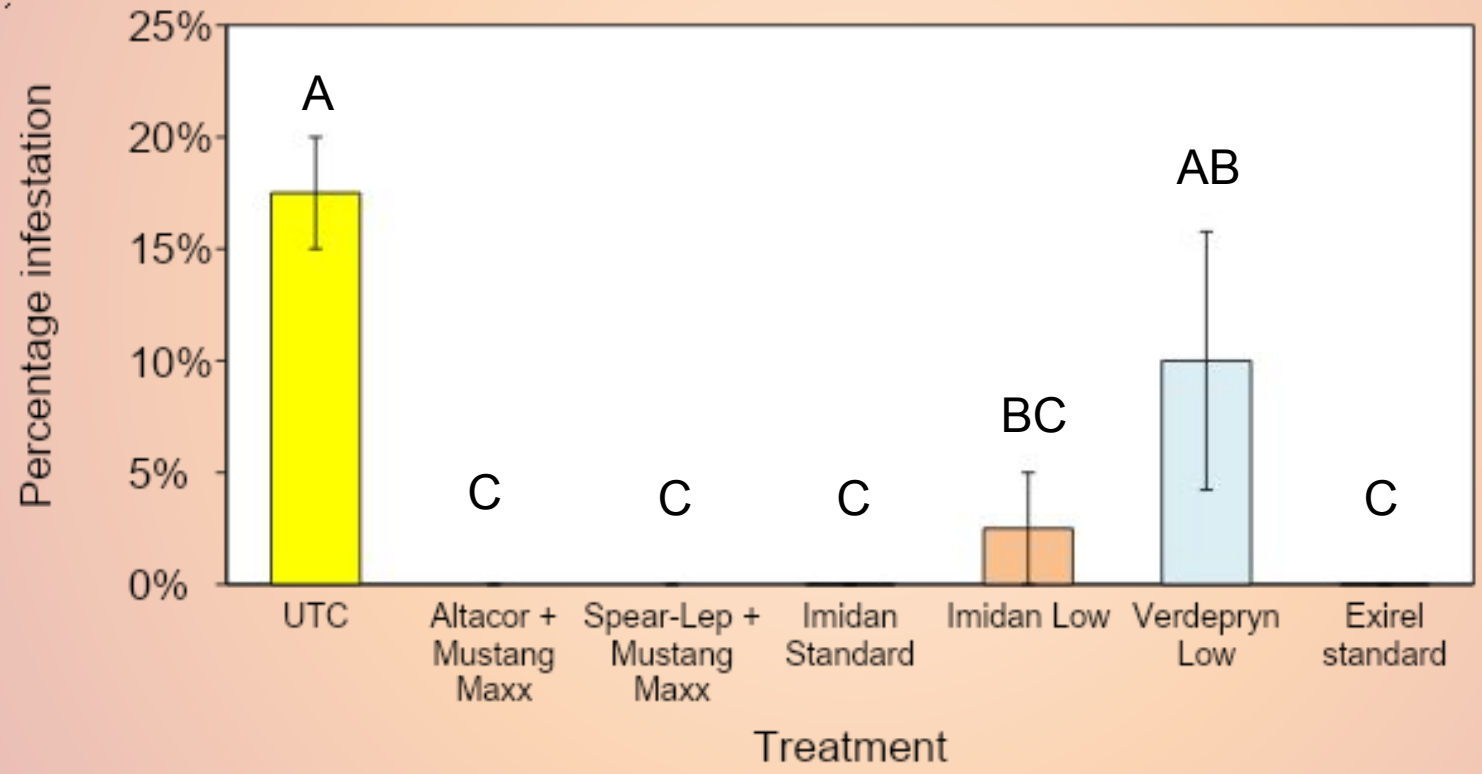
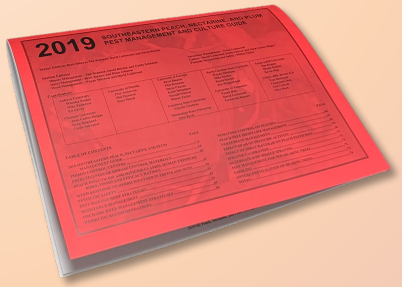


ANOVA $F_{6,21} = 6.01$, $P = 0.001$; Student's t

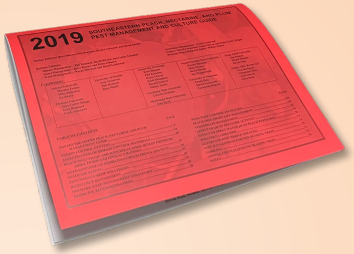
OFM summary

- Mating disruption can be an effective option
- Monitoring can help stay on top of problem
- Several good insecticides at our disposal
  - Rotation is important:
    - Spear-Lep
    - Diamides: Altacor, Exirel, Verdepryn
    - Imidan
- Timing is crucial
  - Follow degree-day model in peach guide



Management resources for 2022

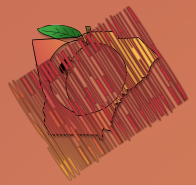
- 2022 Spray guides
  - Print and online



- UGA Peach Blog
  - https://site.extension.uga.edu/peaches/

- MyIPM smartphone app

Thanks!



- UGA Peach Entomology Lab
- Grower cooperators
- Funding
  - Industry support
  - Southern SARE
  - Hatch Funds
  - Georgia Peach Commission
  - South Carolina Peach Council

CBC GROUP

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CERTIS Biologicals

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SOUTHERN SARE Sustainable Agriculture Research & Education

BAYER

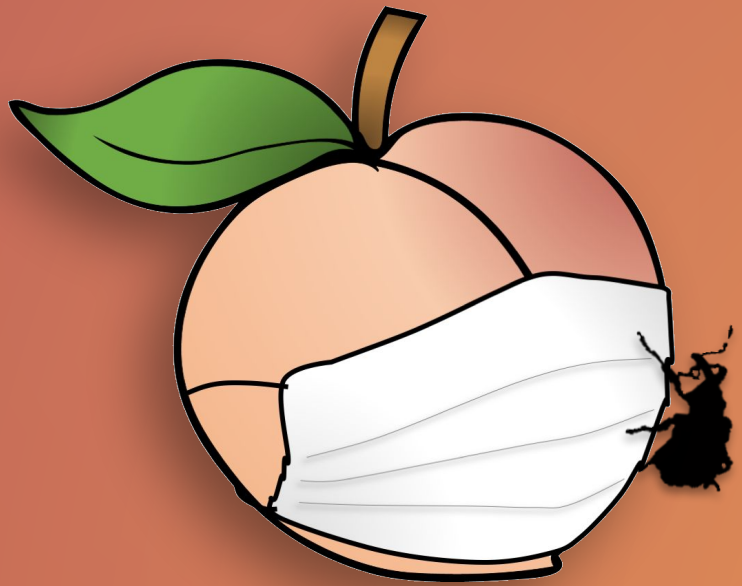
Marrone Bio Innovations

SummitAgro USA

Sweet Georgia Peaches

South Carolina PEACH COUNCIL

QUESTIONS?



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