# 2018 Peach Insect Management Update

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# Insect Update

- Goals of insect management program
- Insecticide options
- What insect monitoring programs are for me?

## **Goal of Insect Management Programs**

- Minimize crop loss due to insects
  - Plum curculio, stink bugs, oriental fruit moth, etc.
- Maintain tree health to enable crop to reach it's potential
  - Peachtree borer, Lesser peachtree borer, scales
- Effective cost-benefit ratio from pesticide expenditures
  - Effective pest control
  - Avoid flare-ups of secondary pests
  - Avoid human and environment health issues

## Insect Damage to Peaches in Non-Treated Controls of Insecticide Trials



### San Jose Scale





Overwinter as immatures on twigs and bark (male oblong).



Winged males emerge and mate with females in early to mid April. Females give birth to live "crawlers." Females never leave their waxy covering.



When scales feed on fruit, a reddish spot surrounds the feeding site



San Jose scale completes 3 to 4 generations in the NC piedmont.



First generation crawlers appear in May. They quickly settle, begin to feed and secrete a waxy scale covering

# San Jose Management Summary

- February Dormant to Delayed Dormant
  - Oil 2% Solution
  - Lorsban 4E (or Advanced) 2 Pts/Acre
- Early May 1<sup>St</sup> Generation Crawlers
  - Esteem 35WP 4 oz/Acre
  - Centaur 70WDG 34.5 oz/Acre
  - Diazinon 50W 1 lb/Acre (4-day REI)



Plant bugs enter orchards in the early spring shortly before bloom. They are attracted to flowers of broadleaf weeds.

Maintaining clean ground cover is the most effective control strategy.



## **Plum Curculio**





- Overwinter as adults in hedgerows, Woods, and trashy fields.
- Most active for 2-3 wks after first warm period after petal fall



## **Plum Curculio and Plant Bug Management**

- Cultural Control
  - Maintain clean ground cover from just before bloom until 4 to 5 weeks after bloom.
- Chemical Control
  - Beginning at petal fall to shuck split, 3 applications at 10 to 14 day intervals.
  - Insecticide choice should focus on products effective against PC and PB.

## **Oriental Fruit Moth**



- 4 generations per year, first adult flight from April to early May.
- Later in season generations overlap, damage potential increases in August and September.





### **Insecticide Options for Petal Fall to 2<sup>nd</sup> Cover**

|             | PHI   | REI   | Scales | Plant<br>bug | Plum<br>Curc. | OFM |
|-------------|-------|-------|--------|--------------|---------------|-----|
| Actara      | 14 d  | 12 h  | F      | E            | E             | F   |
| Assail      | 12 d  | 12 h  | F      | G            | G             | G   |
| Belay       | 21 d  | 12 h  | F      | E            | E             | F   |
| Avaunt      | 14 d  | 12 h  | —      | —            | E             | Е   |
| Imidan      | 14 d  | 3 d   | G      | F            | E             | E   |
| Exirel      | 10 d  | 4 h   | —      | —            | G             | Е   |
| Pyrethroids | Check | label | _      | E            | G-E           | Е   |















## **BMSB Insecticide Options on Tree Fruits**

|       | Insecticide          | Re-entry Interval<br>(hours) | Pre-harvest<br>Interval<br>(days) |
|-------|----------------------|------------------------------|-----------------------------------|
| ic    | Venom, Scorpion      | 12                           | 3                                 |
| eon   | Belay                | 12                           | 7                                 |
| Z     | Actara               | 12                           | 35                                |
|       | Danitol              | 24                           | 14                                |
| oids  | Mustang Max          | 12                           | 14                                |
| ethro | *Brifenture, Brigade | 12                           | 14                                |
| Pyr   | Warrior              | 24                           | 21                                |
|       | Proaxis              | 24                           | 21                                |

### \*Availability dependent on Sect 18 label

## **Insects Affecting Long-Term Health of Tree**

- Scales
  - White peach scale
  - San Jose Scale
- Borers
  - Peachtree borer
  - Lesser peachtree borer

### White Peach Scale

### San Jose Scale





White peach scale infests only wood, and leaves a white fluffy appearance,





San Jose scale infests <u>both</u> wood and fruit. If ignored, SJS can kill trees. Tree decline in abandoned orchards often due to scale.

### **Peachtree Borer**





### **Lesser Peachtree Borer**









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#### RELATIVE EFFECTIVENESS OF VARIOUS INSECTICIDES FOR PEACH INSECTS

(--- = ineffective; +++++ = very effective; n/a = does not apply)

|                  |  | Days PHI<br>and Hours            | Plum<br>Curculio | Oriental<br>Fruit | Peachtree<br>Borer | Catfacing<br>Insects | Scales<br>(White peach | Beetles<br>(June, | Thrips |
|------------------|--|----------------------------------|------------------|-------------------|--------------------|----------------------|------------------------|-------------------|--------|
| MOA <sup>a</sup> | Insecticide formulation and<br>Product/acr e             | or Days<br>(REI) *               |                  | Moth              |                    | (stink<br>bugs)      | & San Jose)            | Japanese)         |        |
| 1A               | carbaryl (Sevin 80SP) 1.25 lb                            | 3 (12 hr)                        | +                | ++                | +                  | +                    | ++                     | +++++             |        |
|                  | methomyl (Lannate 2.4L) 1 pt                             | 4 (4 days)                       | +++              | ++++              | +                  | ++++                 | +                      | ++                | +++    |
| 1B               | chlorpyrifos (Lorsban 4EC)<br>3 qt                       | Prebloom&<br>postharvest<br>only | na               | na                | +++++              | na                   | +++++                  | na                | na     |
|                  | phosmet (Imidan 70WSB)<br>1.5 lb                         | 14 (3 days)                      | ++++             | ++++              | +                  | +                    | +                      | +++               | +      |
| 3A               | beta-cyfluthrin (Baythroid<br>XL) 1 oz                   | 7 (12 hr)                        | ++++             | +++++             | ++                 | ++++                 |                        | ++++              |        |
|                  | esfenvalerate (Asana XL) 5.8<br>oz                       | 14 (12 hr)                       | +++              | +++++             | ++                 | +++                  |                        | ++++              | +      |
|                  | fenpropathrin (Danitol 2.4EC)<br>16 oz                   | 3 (24 hr)                        | +++++            | +++++             | ++                 | +++++                |                        | +++++             | +      |
|                  | gamma-cyhalothrin (Proaxis<br>0.5EC) 3.8 oz              | 14 (24 hr)                       | ++++             | +++++             | ++                 | ++++                 |                        | ++++              | +      |
|                  | lambda-cyhalothrin (Karate<br>2.08CS) 1.9oz              | 14 (24 hr)                       | ++++             | +++++             | ++                 | ++++                 |                        | ++++              | +      |
|                  | permethrin (Permethin<br>3.2EC,25WP)<br>6 oz             | 14 (12 hr)                       | ++++             | +++++             | ++                 | ++++                 |                        | ++++              | +      |
|                  | Zeta-cympermethrin (Mustang<br>Maxx) 2.0 oz              | 14 (12hr)                        | ++++             | +++++             | ++                 | ++++                 |                        | ++++              | +      |
| 4A               | acetamiprid (Assail 30SG) 7 oz                           | 7 (12hr)                         | ++               | ++++              |                    | ++                   | +++                    | ++++              | +      |
|                  | chothianidin (Belay SL) 6 oz                             | 21 (12 hr)                       | ++++             | +                 |                    | ++++                 |                        | +++               | +      |
|                  | dinotefuran (Scorpion 35SL)<br>5.25 oz (Venom 70SG) 4 oz | 3 (12 hr)                        | ++++             | +                 |                    | ++++                 |                        | +++               | +      |
|                  | imidacloprid (Provado 1.6F)<br>3 oz                      | 0 (12 hr)                        | +                |                   |                    | ++                   |                        | +++               | +      |
|                  | thiamethoxam (Actara<br>25WDG) 2.5 oz                    | 14 (24 hr)                       | +++++            | ++                |                    | ++++                 | ++                     | +++               | +      |
| 5                | spinetoram (Delegate 25WDG)<br>2.5 oz                    | 7 (4 hr)                         | +                | +++++             |                    |                      |                        | +                 | ++++   |
| 7C               | pyriproxyfen (Esteem 35WP)<br>5 oz                       | 14 (12 hr)                       |                  | ++                |                    |                      | +++++                  |                   |        |
| 9C               | flonicamid (Beleay 50SG)                                 | 14 (12 hr)                       |                  |                   |                    | +++                  |                        |                   | ++++   |
| 16               | buprofezin (Centaur 70WSB)<br>17 oz                      | 14 (12 hr)                       |                  |                   |                    |                      | +++++                  |                   |        |
| 22               | indoxacarb (Avaunt 30WG) 3 oz                            | 14 (12 hr)                       | +++++            | ++++              | +                  | +                    | +                      | ++++              |        |
| 23               | spirotetramat (Movento 2SC)<br>8 oz                      | 14 (12 hr)                       |                  |                   |                    |                      | ++++                   |                   |        |
| 28               | chlorantraniliprole (Altacor<br>35WDG) 2.5 oz            | 10 (4 hr)                        |                  | +++++             | +++                |                      |                        |                   | ++     |
|                  | cyantraniliprole (Exirel 0.83<br>SEO) 15 oz              | 3 (12 hr)                        | ++               | +++++             | +++++              | +                    |                        | ++                | ++     |

### **Pyrethroids Registered on Peaches**

| Product     | PHI | SCL | PB | РС | OFM | SB | Mites |
|-------------|-----|-----|----|----|-----|----|-------|
| Asana       | 14  | —   | E  | G  | Е   | F  | —     |
| Baythroid   | 7   | —   | Е  | Е  | Е   | G  | —     |
| Danitol     | 3   | —   | Е  | Е  | Е   | Е  | F     |
| Karate      | 14  | —   | Е  | Е  | E   | Ε  | F     |
| Mustang Max | 14  | —   | E  | E  | E   | Е  | —     |
| Perm-Up     | 14  | —   | Е  | E  | Е   | F  | —     |
| Proaxis     | 14  | _   | E  | E  | Е   | Е  | F     |
| Tombstone   | 7   | _   | E  | E  | E   | E  | _     |

### **Insecticide Premixes**

| Brand<br>name  | Product<br>mixes    | SCL | PB | РС | OFM | SB | Mite |
|----------------|---------------------|-----|----|----|-----|----|------|
| Besiege        | Altacor<br>Karate   | _   | E  | E  | E   | Е  | G    |
| Cormoran       | Assail<br>Rimon     | F   | F  | F  | G   | F  | —    |
| Endigo         | Actara<br>Karate    | F   | Ε  | Е  | Е   | Е  | G    |
| Leverage       | Admire<br>Baythroid | —   | Ε  | Е  | Е   | G  | —    |
| Minecto<br>Pro | Exirel<br>Agri-Mek  | F   | —  | G  | Е   | —  | E    |
| Voliam Flexi   | Actara<br>Altacor   | F   | Ε  | E  | E   | Е  | —    |

### **Insecticide Premixes**

| Brand<br>name | Product<br>mixes  | SCL | РВ | РС | OFM | SB | Mite |
|---------------|-------------------|-----|----|----|-----|----|------|
| Besiege       | Altacor<br>Karate | —   | Е  | Е  | Е   | Ε  | G    |
|               |                   |     |    |    |     |    |      |
| Endigo        | Actara<br>Karate  | F   | Ε  | Ε  | Ε   | Ε  | G    |
|               |                   |     |    |    |     |    |      |
|               |                   |     |    |    |     |    |      |
| Voliam Flexi  | Actara<br>Altacor | F   | Е  | Ε  | Ε   | Е  | —    |

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## **Insect Monitoring Programs**

- Most "simple" monitoring programs use pheromones
- Some are a combination of olfactory and visual stimuli
- Well established monitoring tools
  - Plum curculio
  - Lepidopterans (OFM, PTB, LPTB)
  - Brown marmorated stink bug







### Grandisoic Acid

### Benzaldehyde











## **BMSB Attractants**



1. Pheromone:

BMSB male-produced aggregation pheromone. Twocomponent blend of chemicals.

### 2. Synergist:

Methy decatrienoate (MDT). Male-produced aggregation pheromone of a Japanese stink bug (*Plautia stali*).

## **BMSB Sticky Panel Trap**







# Delt Style Pheromone Traps for Oriental Fruit Moth

# **OFM Pheromone Lures**

- Female-produced sex pheromone
- OFM lure (0.5 mg lure)
- OFM L2 (3.0 mg lure)
- OFM Enhanced
  - OFM L2
  - Codling moth pheromone
  - Acetic acid
  - Host plant induced volatiles (HPIV)
    - Terpenyl acetate
    - Hexenyl acetate

### OFM – Mean Across All TRTs (Laughter)



# **Most Useful Monitoring Tools**

- BMSB sticky panel trap to measure movement into Sand Hills region.
- OFM trap to determine population trends in and shift in importance over time.
- Results from both trapping sytems could be useful to
  - Adjust choice of insecticide used
  - Frequency of application