

# **Insect Scouting & Management in Peaches**

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# PEACH PLANT SYMPTOMS AND ARTHROPOD IDENTIFICATION

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# HANDOUT

<b>Plant Symptoms</b>	<b>When and How to Look</b>	<b>Arthropod Description</b>	<b>Common Name</b>
Altered fuzz on fruit, ooze feeding puncture (catfacing)	Mid-March to harvest inspect fruit, look at white sticky traps hung from lower limb	Bug, sucking mouthpart, 1/4", yellow "Y" on back, mottled brown	Tarnished plant bug
May to harvest feeding form clear ooze (no catfacing)	Mid-April to harvest inspect fruit for bugs or damage or check baited yellow pyramid trap	Bug, sucking mouthpart, 3/4", green or brown, stink when handled	Brown stink bug Dusky stink bug Green stink bug
Altered fuzz on fruit, egg under fuzz, larva tunnels in fruit, damage called catface scar, no ooze	April 1: tether gray funnel traps with commercial bait to perimeter peach trunk, weekly check traps for weevils & 300 fruit for damage	Adult weevil, 1/4", brown snout, 3 pr humps on back, Larva, 1/4", white, legless, brown head	Plum curculio
Fruit surface has sawdust-like larval dropping or frass and dying terminals have brown wilted leaves (brown flagging)	Mid-March, set out pheromone traps, check weekly for moths, accumulate degree degree-days (DD) after 1 <sup>st</sup> moth catch, fruit and twig damage occurs by 500, 1,300, 2,200 and 3,100 DD	Moth, 1/4", sooty gray, white to pinkish Larva, 3/4", legs	Oriental fruit moth
Tunnel below bark below soil line on trunk	Mid-April, set pheromone traps, once traps catch moths, drench trunk with insecticide	Moth, 1-1/4", female has orange band on abdomen; male has yellow bands on black abdomen Larva, 1-1/2", white, 6 legs	Peachtree borer
Tunnel below bark in wounds on scaffold limbs	April 1, set pheromone traps, if moths captured, apply insecticide drench to scaffold wounds at pink each year	Clearwing moth, 1", both sexes have yellow bands on black abdomen Larva, 1", white, 6 legs	Lesser peachtree borer
Scales on limbs and limbs dead	April 1, wrap double sticky tape around scale-infested limbs and check weekly for yellow crawlers	Adult yellow female is legless, has circular gray scale covering 1.4 mm diameter, yellow males are winged and yellow crawlers have 6 legs	San Jose scale



# HANDOUT: pictures of peach insects and scouting methods



# Key to Fruit Pests on previous page

1. Oriental fruit moth (OFM)
2. OFM larval entry stem end
3. OFM larva
4. OFM flagged terminal
5. San Jose scale (SJS) on limb
6. SJS on peach fruit
7. SJS winged adult male
8. Strawberry clipper (SC) weevil
9. SC clipped flower buds
10. Plum curculio (PC) fuzz damage
11. PC adult weevil and egg laying scar
12. PC egg
13. PC legless larva
14. Spotted wing drosophila male fly
15. Cutworm
16. Tarnished plant bug
17. White grubs in soil
18. Peachtree borer female & male
19. Lesser peachtree borer pupal skin
20. Red carmine mite
21. Two-spotted spider mite
22. Predator mite
23. True armyworm
24. Green stink bug

# Weekly Pest Scouting Form



Date: _____ 1				
Orchard: _____ Block: _____				
<b>Plum curculio adults / traps</b>				
1	2	3	<b>Mean</b>	
<b>Oriental fruit moths / pheromone trap</b>				
1	2	3	<b>Mean</b>	
<b>Limb jar 1 tree next to each trap</b>				
1	2	3	<b>Mean</b>	
<b>SB or TPB</b>				
<b>PC</b>				
<b>Damage 300 fruit near ea trap</b>				
1	2	3	<b>Mean</b>	
<b>SB</b>				
<b>PC</b>				
<b>OFM</b>				
<b>Recommendations:</b>				



# Biofix date

**Biofix** – the first date when traps consistently catch insects on several consecutive trapping dates – in the example below the **biofix is 23 Apr.** and not 16 Apr.

**Example**, we recorded trap catch for codling moth in Carroll Co. AR in 2010:

	April					May			
Sampling dates:	<u>5</u>	<u>9</u>	<u>13</u>	<u>16</u>	<u>20</u>	<u>23</u>	<u>27</u>	<u>1</u>	<u>4</u>
Codling moths per trap:	0	0	0	1	0	6	2	4	4

Note, codling moths lay eggs only in the evening when the temperature at dusk exceeds 62°F which occurred from 21 to 23 April and after 28 April

# Physiological Time (degree-days = DD)

Source: <http://ipm.ucdavis.edu/WEATHER/ddphenology.html>

- Poikilothermic – insects are cold-blooded
- Physiological time (expressed in DD)
  - Number of heat units accumulated daily between the lower (LDT) and upper (UDT) developmental thresholds required to complete growth before molting to next stage
- Why use a phenology model?
  - Predict time of events in an organism's development
  - Pest damage rarely occurs on the same calendar date every year

# How to Calculate DD

## Daily Degree Day (DD) Formula

<http://dpecan.uaex.edu/Default.asp>

$$DD = \frac{\text{Max} + \text{Min}}{2} - X$$

### Base temperatures:

X = 43.5 F for grape phylloxera

X = 50 F for grape scale

X = 45 F for Oriental fruit moth

X = 47.1 F for grape berry moth

X = 50 F for codling moth

X = 50 F for plum curculio

X = 51 F for San Jose scale

X = 50 F for cranberry fruitworm

### Use tactic after:

> 500 DD crawlers emerge

> 500 DD crawlers emerge

after 1 January

> 400 DD hatch

> 400 DD hatch

> 250 DD hatch

> 100 DD start feeding

> 400 DD crawler emerge

> 400 DD egg laying



# NEW: Tour of Fruit Insect DD Calculator:

click: <http://pecan.uaex.edu/DD35SelectInsects.asp>



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Select the appropriate insect from the list below, the county of the field location, and the date of biofix. The corresponding "Degree Day" will be used in calculating the report on the next page.

1. Select Insect	<input type="text"/>
2. Select county of field location	Arkansas (DE) <input type="text"/>
3. Enter the biofix date	January <input type="text"/> 1 <input type="text"/>
<input type="button" value="Submit"/>	

# Monitoring Plum Curculio



New and old PC damage on apple

**After 1<sup>st</sup> day in March  $\geq 70^{\circ}$  F:**

- Set out four pyramid traps
- Benzaldehyde + plum essence above funnel
- Tied next to perimeter peach or apple trees adjacent to woods
- Check traps twice weekly for PC
- Check 100 fruit for damage weekly

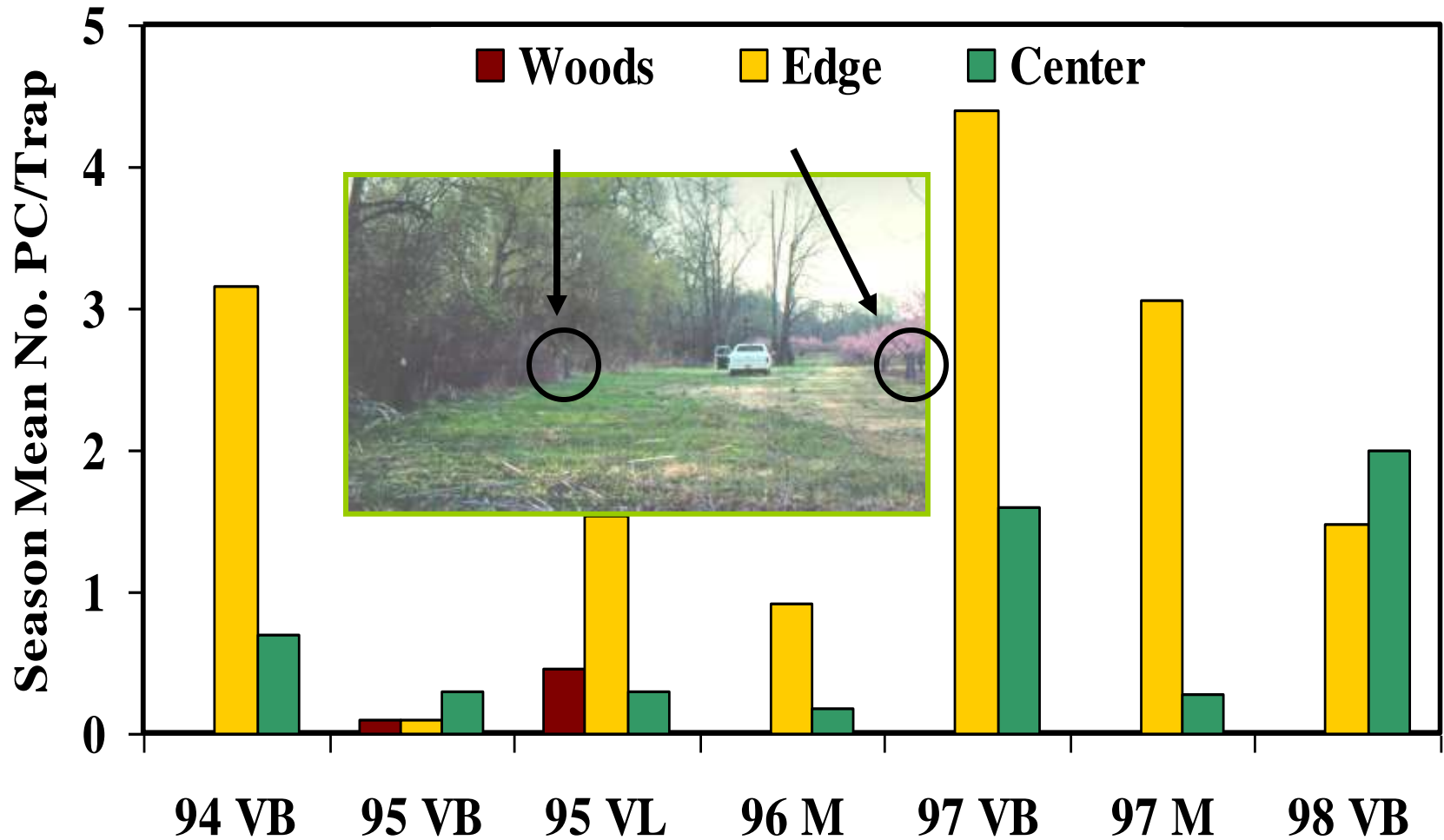
**Economic threshold (spray): ET > 1 PC/ trap/ wk  
or ET > 1% new damage**



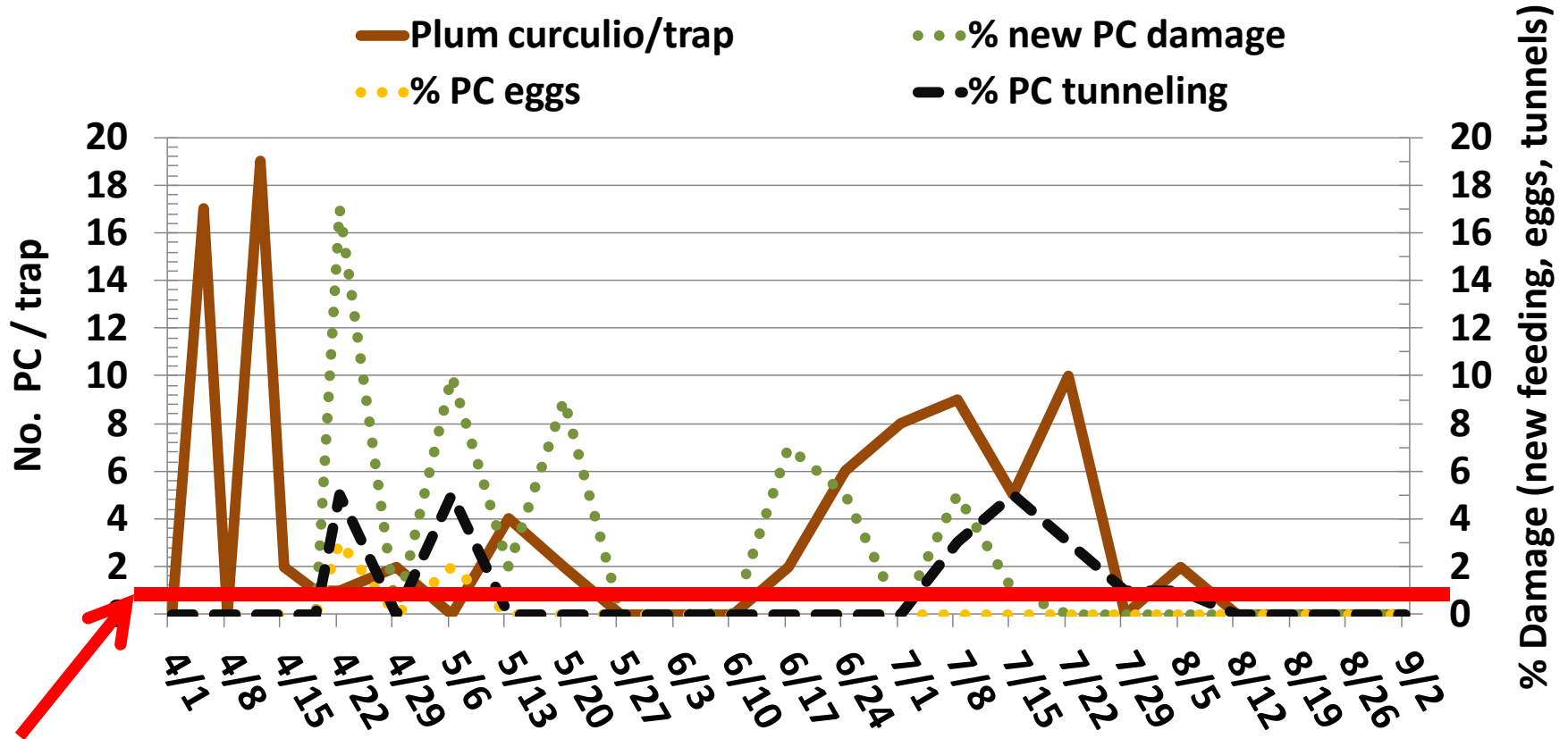
New PC damage on peach  
(lighter fuzz spots)

**Time to spray**

# Effect of Trap Location



# Clarksville 2011



**ET = 1 PC/trap/week**



Feeding scars  
Apple ----- Peach



Egg



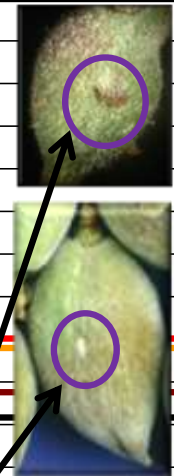
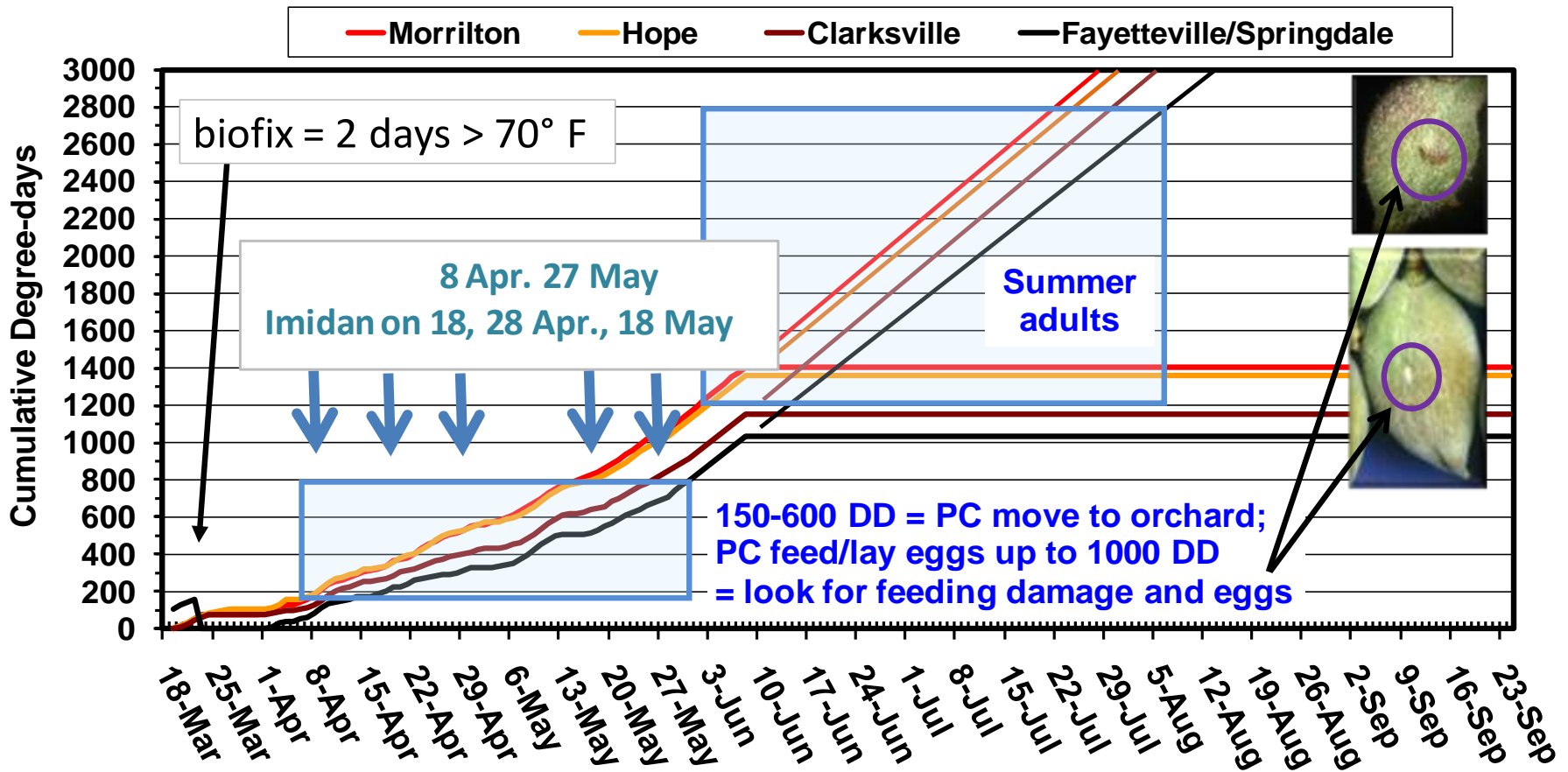
Tunnel

# 2011 Plum Curculio Sprays

Arkansas Plum Curculio 2011 (Base 50°F/Upper 90°F)

Spray coverage: 1st generation = 200 - 800 DD (hatch)

After 1,200 & 2400 DD, check for new fruit damage weekly thru harvest



# STINK BUGS



**A**



**B**



**C**



**D**

**A) Rice; B) Brown; C) Green; and D) Red-shouldered**



# Brown Stink Bug Biology

Mid-April to May, move into orchard, puncture fruit causing catface damage



Late May and early June, nymphs



After pit hardening to harvest, puncturing fruit causes thread of clear ooze



August, adults go to overwintering sites

# Stink bugs found in Blackberry plantings



**Green SB adult**



**Green SB nymph**



**Brown SB adult**



**Brown SB nymph**



**Red Shoulder SB adult**



# Weekly Scouting

SB specimens were identified to species

Traps were re-baited weekly

Counted number of SB / trap

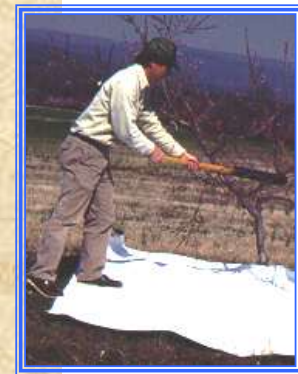
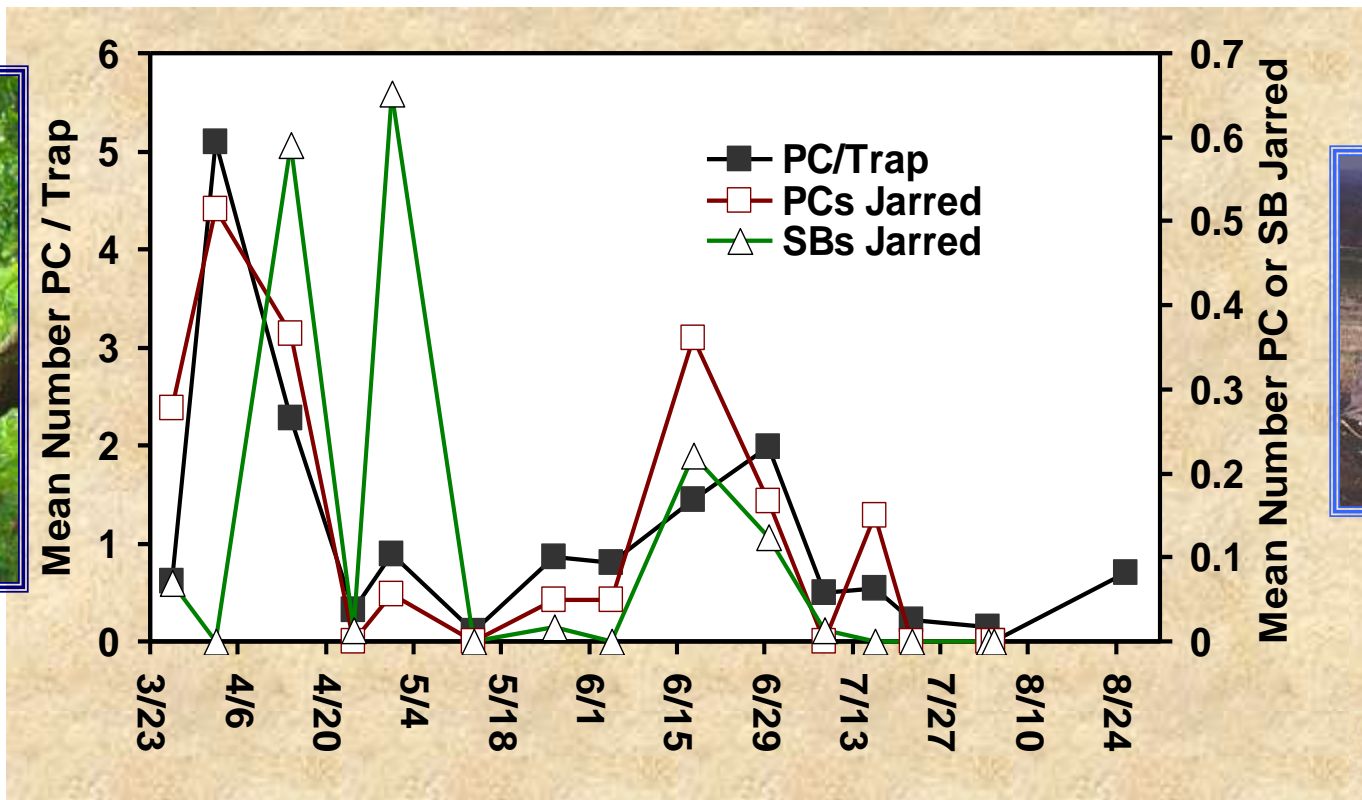
Estimated % damage

– Inspected 30 fruit on each of 10 plants

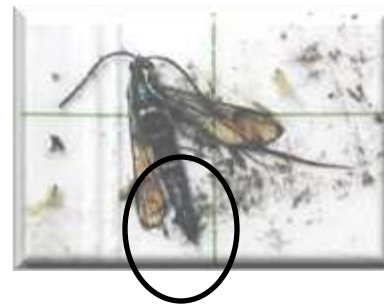
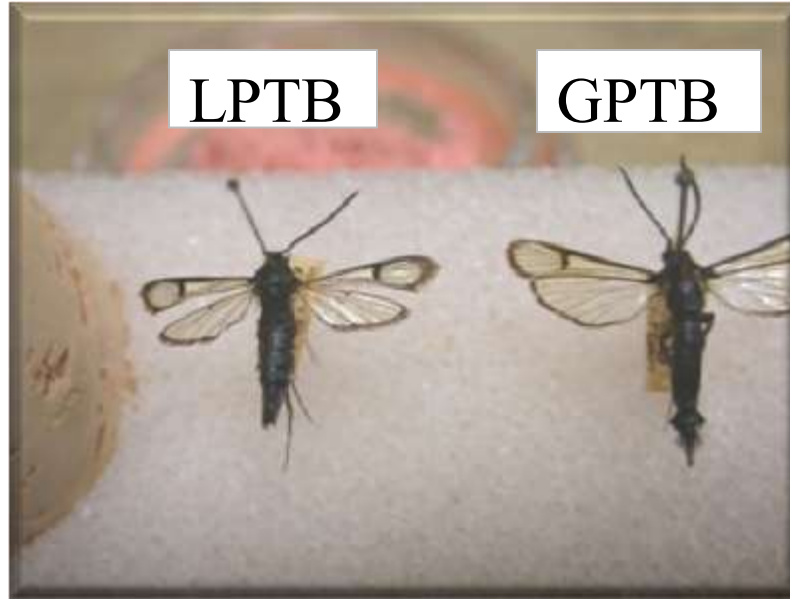


# PC and SB Catch

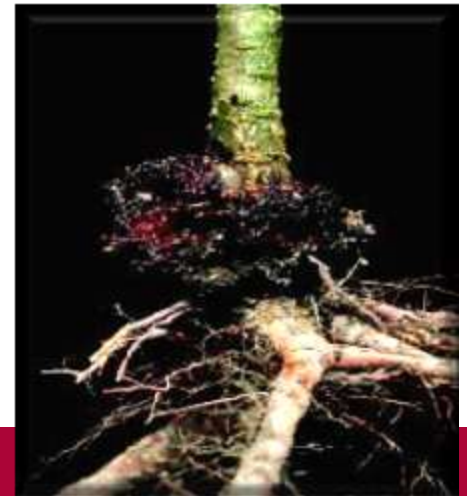
## Forrest City, AR 1998



# Lesser and Greater Peachtree Borers



GPTB In trap



# Oriental Fruit Moth Damage



Terminal flagging

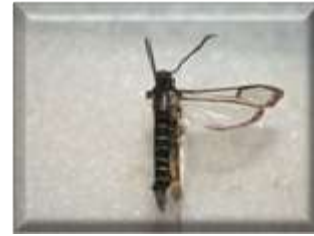
Anal comb on  
anal tip of larva



Entry hole at stem end and pinkish larva in fruit



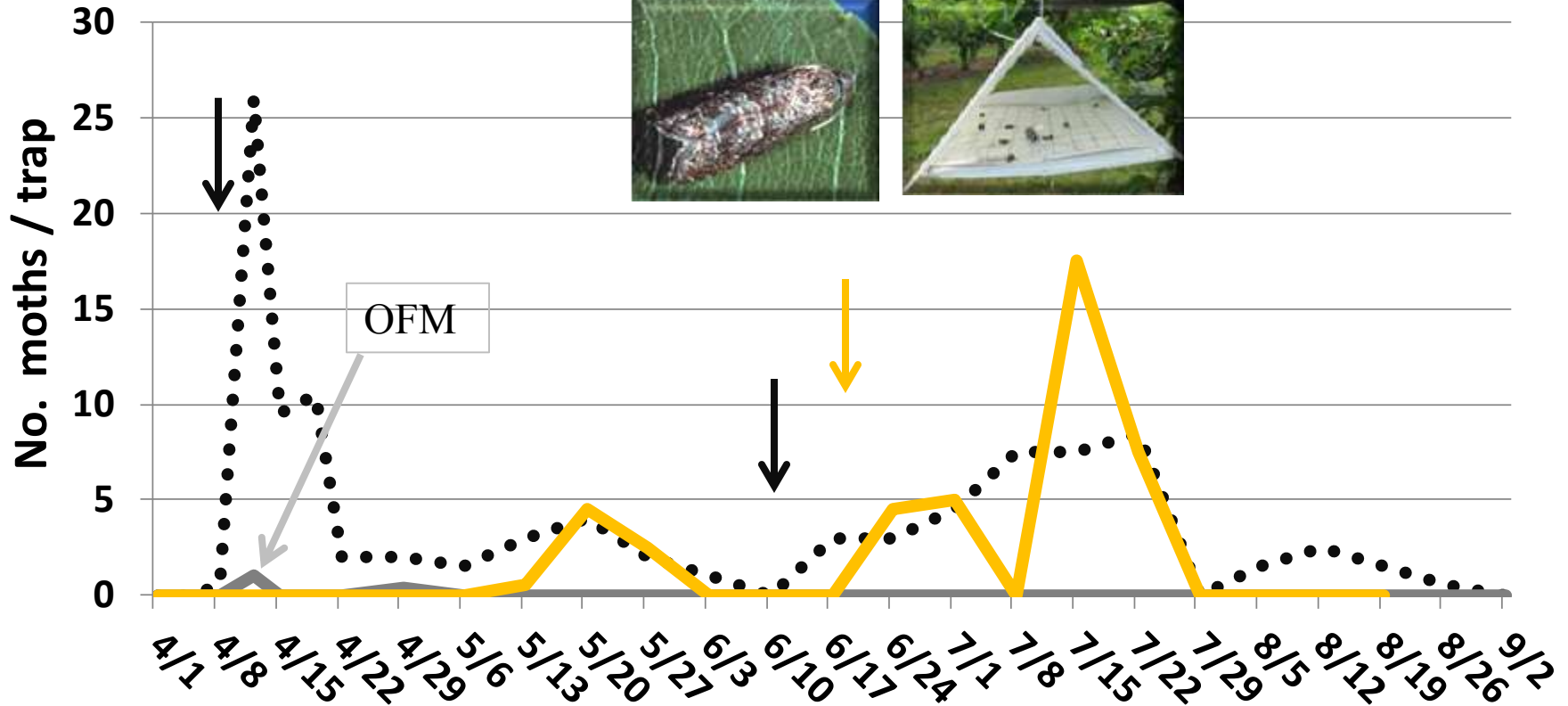
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••• LPTB/trap

— OFM/trap

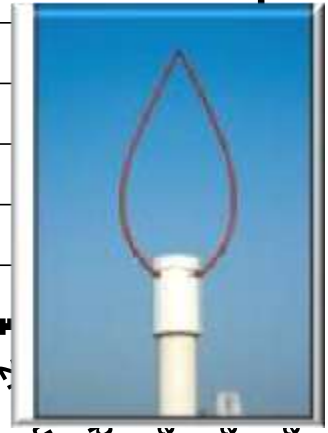
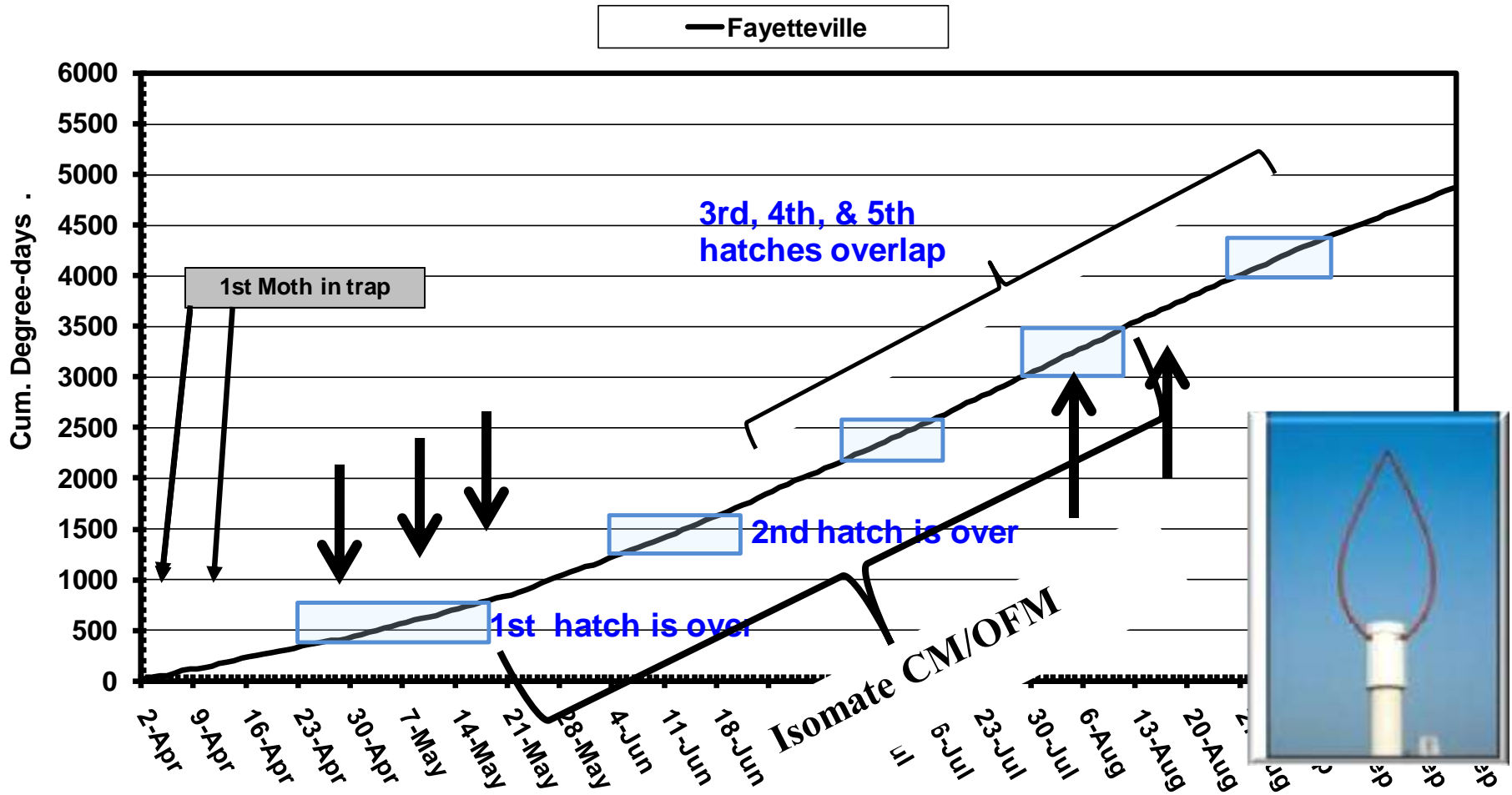
— GPTB/trap





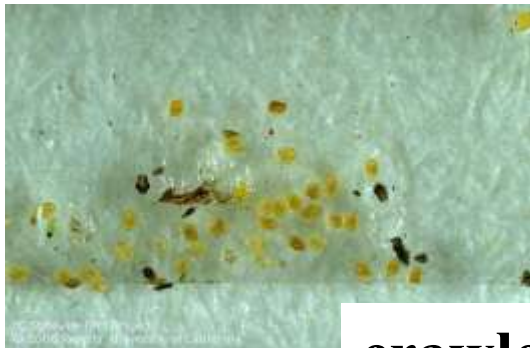
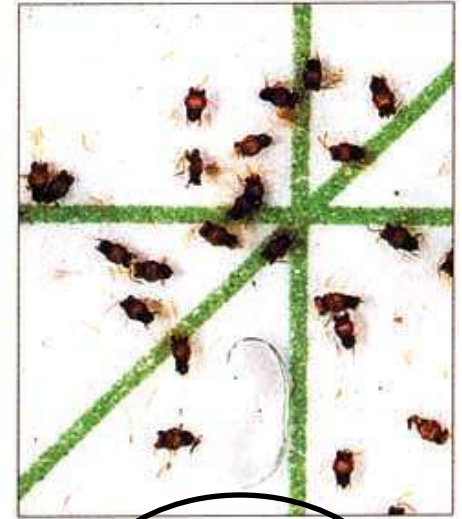
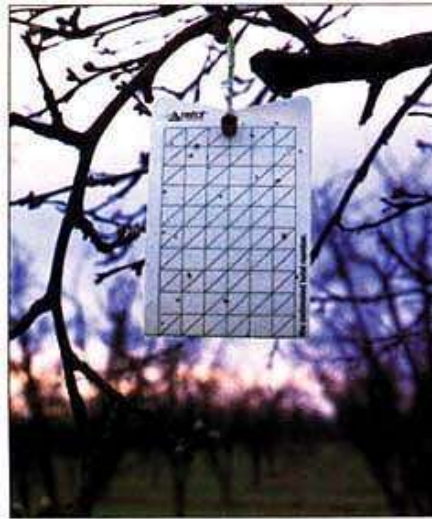
## Arkansas Oriental Fruit Moth 2010 (Base 45° F/Upper 90° F)

**Spray:** 1st generation = 400-700 DD (hatch);  
 2nd - 5th hatches: 1300; 2200; 3100; and **4000 DD**  
**Weekly, check for new fruit damage**

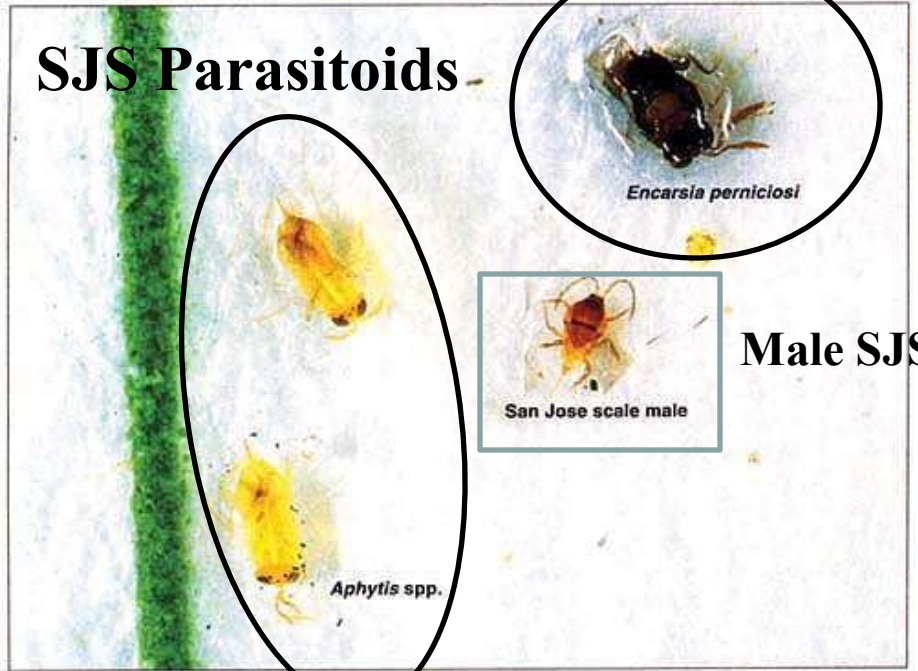


# San Jose Scale Pheromone Trap

# Limb Tape Trap



crawlers



Male SJS



San Jose scale has become an increasingly damaging pest in many almond-growing regions of California. However, the numbers trapped in the study orchards, located in Merced and Stanislaus counties, were very low. *Clockwise from top left*, Sticky traps are used to monitor San Jose scale males; the numbers of a key San Jose Scale parasitoid, *Encarsia perniciosi*, were significantly higher in the BIOS orchards; the abundance of another San Jose scale parasitoid, *Aphytis* spp., did not vary significantly between BIOS and conventional orchards.

# 2011 San Jose Scale Crawler by 400 DD (base 51F) after 1<sup>st</sup> Males

Need SJS trap out by 1 March in SJS infested tree

Having trouble getting catch on SJS traps

Set out sticky tapes on infested limb by 130 DD after 1 Jan.

Sticky Tape Catches = *time to spray SJS with Esteem:*

- 29 April: 6 crawlers
- 6 May: 11.3 crawlers
- 13 May: 1.7 crawlers



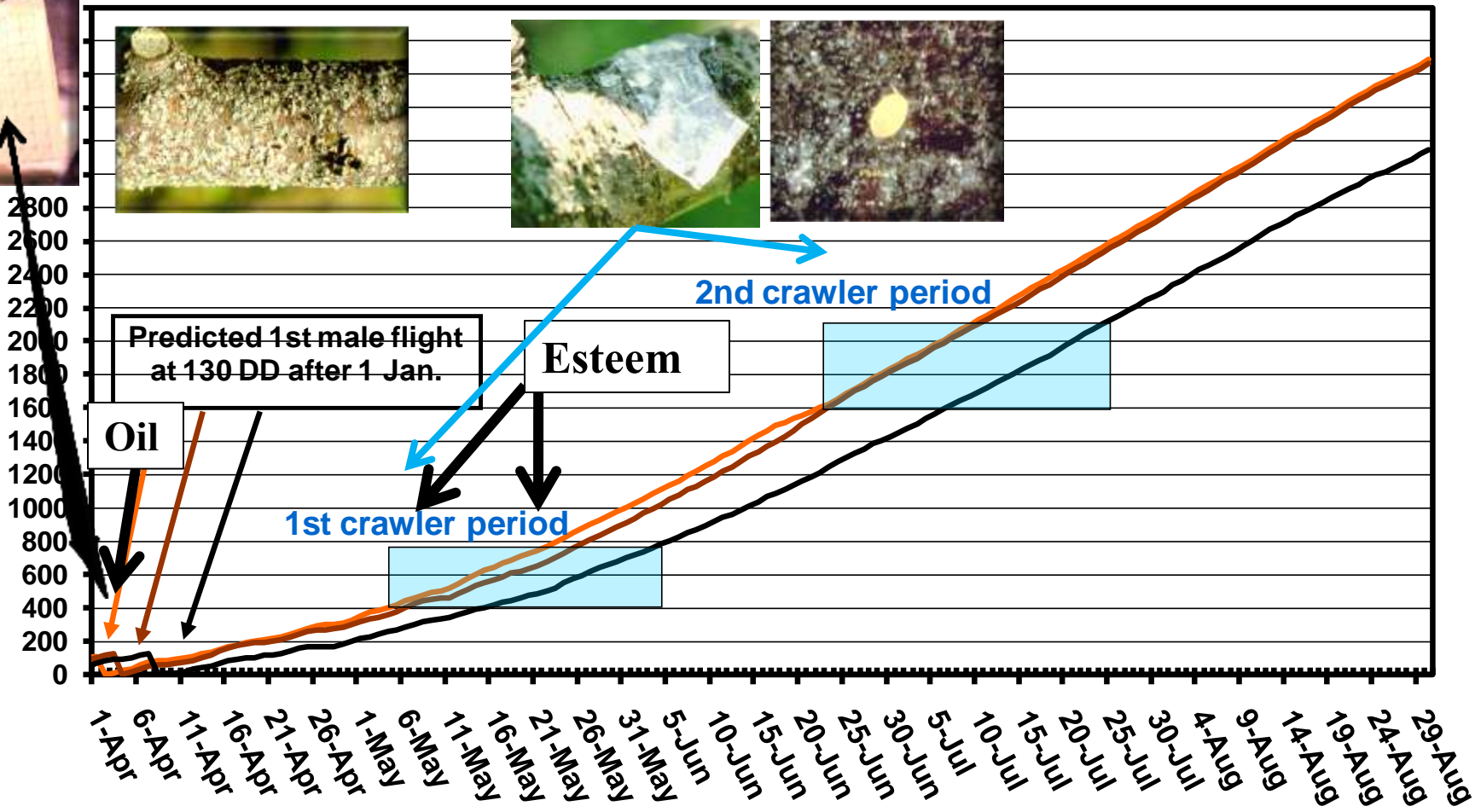


**Arkansas San Jose Scale 2010:**  
 DD Base/Upper = 51/90°F; Male flight at 130 DD since Jan. 1  
 1st crawlers emerge from 400 to 700 DD after 1st male flight;  
**2nd crawlers emerge after 1587 DD**



Cumulative DD

— Hope — Clarksville — Fayetteville



# PEACH INSECTICIDE AND MITICIDE CLASSES, HUMAN EXPOSURE RISKS, FINISH AND EFFICACY

**RATINGS** (+++++ = excellent, ++++ = good, +++ = fair, ++ = poor, + = suppression, - = no benefit) See IPM Management Guide section for rates and particulars. These ratings are benchmarks, actual performance will vary.

<i>Common Name (IRAC #)</i>	<i>Trade Name(s)</i>	<i>Scale</i>	<i>Thrips</i>	<i>Oriental fruit moth</i>	<i>Plum curculio</i>	<i>Plant or Stink bugs</i>	<i>June beetles, etc.</i>	<i>Mites</i>	<i>Borers</i>
<i>abamectin (6)</i>	Agri-Mek	-	-	-	-	-	-	++++	-
<i>beta cyfluthrin (3A)</i>	Baythroid XL	- promotes scale	++	+++++	++ - +++++	++++	++++	- promotes mites	+++
<i>bifenazate (UN)</i>	Acramite	-	-	-	-	-	-	+++++	-
<i>buprofezin (16)</i>	Centaur	+++++	-	-	-	-	-	-	-
<i>carbaryl (1A)</i>	Sevin	- promotes scale	-	++++	+++	++	+++++	- promotes mites	-
<i>chlorpyrifos (1B)</i>	Chlorpyrifos Lorsban	+	+	-	++++	-	-	-	+++++
<i>clofentezine (10A)</i>	Apollo	-	-	-	-	-	-	+++++ ovicide	-
<i>cyfluthrin (3A)</i>	Renounce Tombstone	- promotes scale	++	++++	+++	+++	++++	- promotes mites	++
<i>cyfluthrin (3) + imidacloprid (4A)</i>	Leverage	- promotes scale	++	++++	+++	+++	++++	- promotes mites	++
<i>cyhexatin (12B)</i>	Vendex	-	-	-	-	-	-	++++	-
<i>diazinon (1B)</i>	Diazinon	+++	++	+++++	++	++	++++	-	+
<i>endosulfan (2A)</i>	Phaser Thiodan	+	++	++++	-	++++	++++	- promotes mites	++++
<i>esfenvalerate (3A)</i>	Adjourn Asana	- promotes scale	++	+++++	++ - +++++	++	++++	- promotes mites	+++
<i>formetanate (1A)</i>	Carzol	-	++++	-	-	++++	-	++++	-
<i>gamma cyhalothrin (3)</i>	Proaxis	- promotes scale	++	+++++	+++	++++	++++	- promotes mites	+
<i>hexythiazox (10A)</i>	Savey	-	-	-	-	-	-	+++++ ovicide	-
<i>horticultural oils</i>	miscellaneous	++++	-	-	-	-	-	++++	-

**PEACH INSECTICIDE AND MITICIDE CLASSES, HUMAN EXPOSURE RISKS, FINISH AND EFFICACY RATINGS (continued)**

<i>Common Name (IRAC #)</i>	<i>Trade Name(s)</i>	<i>Scale</i>	<i>Thrips</i>	<i>Oriental fruit moth</i>	<i>Plum curculio</i>	<i>Plant or Stink bugs</i>	<i>June beetles, etc.</i>	<i>Mites</i>	<i>Borers</i>
<i>imidacloprid (4A)</i>	Couraze Nuprid Pasada Provado	++	-	++	+	++	+++++	- promotes mites	-
<i>indoxacarb (22A)</i>	Avaunt	-	-	++++	++++	++	-	-	+
	Isomate-L (pheromone mating disruption ties)								+++ to ++++
<i>lambda cyhalothrin (3A)</i>	Lambda-T Silencer Taiga Warrior	- promotes scale	++	+++++	+++	++++	++++	- promotes mites	+
<i>malathion (1B)</i>	Malathion	+	+	++	++	++	+	+	+
<i>methidathion (1B)</i>	Supracide	+++	-	-	-	-	-	++	+++
<i>methomyl (1A)</i>	Lamate	-	++++	++++	+	++	++++	- promotes mites	-
<i>permethrin (3A)</i>	Ambush Pounce	- promotes scale	++	+++++	++	++++	++++	- promotes mites	+
<i>phosmet (1B)</i>	Imidan	++++	+	+++++	+++++	++++	+++++	-	+
<i>pyridaben (21A)</i>	Nexter	-	-	-	-	-	-	++++	-
<i>pyriproxyfen (7C)</i>	Esteem Knack	+++++	-	+++	-	-	-	-	++
<i>spinetoram (5)</i>	Delegate	-	++++	++++	+	-	-	-	+
<i>spinosad (5)</i>	SpinTor	-	++++	++	-	-	-	++	-
<i>spirodiclofen (23)</i>	Envidor	-	-	-	-	-	-	++++	-
<i>spirotetramat (23)</i>	Movento	+++-++++	-	-	-	-	-	-	-
<i>thiamethoxam (4A)</i>	Actara	+	+	+++	++++	+++-++++	++++	-	-
<i>zeta cypermethrin (3A)</i>	Mustang		++	+++++	++-+++++	++++	++++	- promotes mites	+++

# Questions?