Managing Oriental Fruit Moth in Canning Peach Orchards in the San Joaquin Valley of California

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Seasonal Guide
to Environmentally Responsible
Pest Management Practices in
Peaches and Nectarines
University of California
Agriculture and
Natural Resources
Publication 3502

Insects and Mites in CA Peaches

- Oriental fruit moth (OFM)
- Peach twig borer (PTB)
- Oblique-banded leafroller (OBLR)
- Omnivorous leafroller (OLR)
- San Jose Scale and its natural enemies
- Spider mites and their predators
- OFM parasitoid *Macrocentrus ancylivorus*
- General orchard predators

Oriental Fruit Moth (OFM)
UC Statewide IPM Project
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Omnivorous Leafroller (OFM)
UC Statewide IPM Project
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Peach Twig Borer (PTB)

Obliquebanded Leafroller (OBLR)
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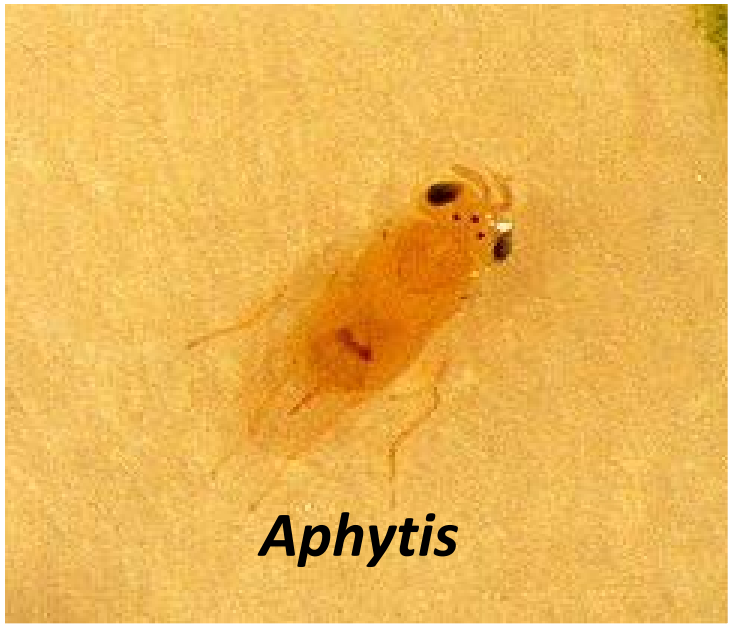
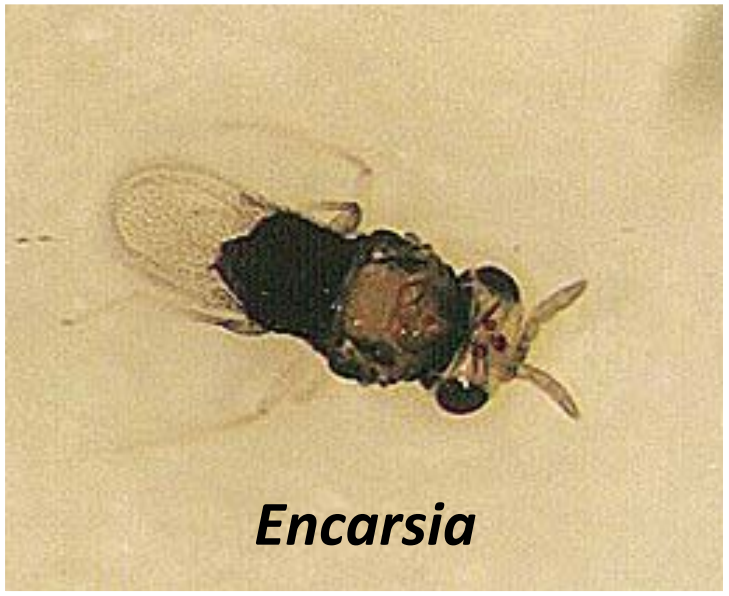
San Jose Scale & Natural Enemies





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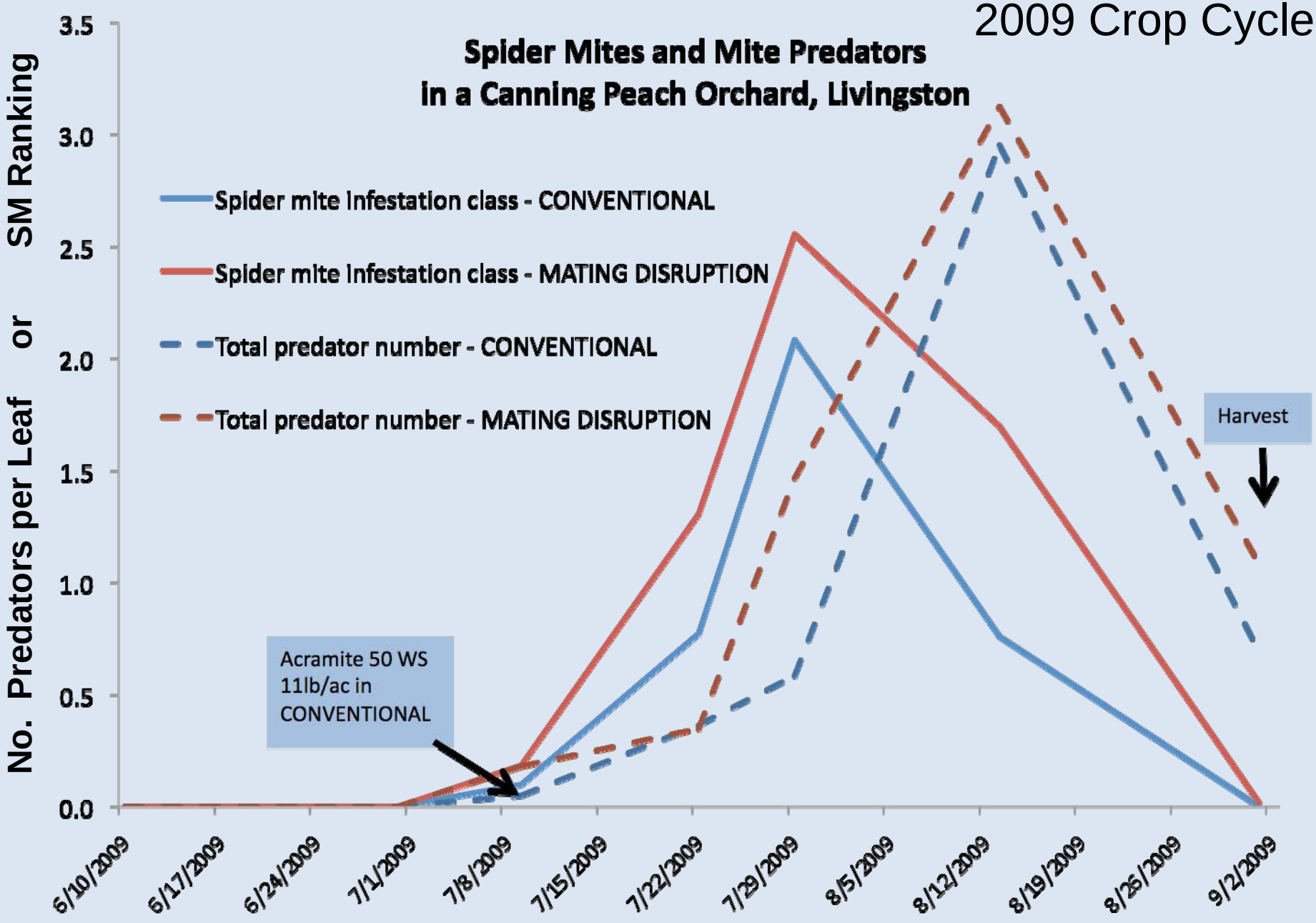
Webspinning spider mites

Predators

- Western predatory mite
- Six-spotted thrips
- Spider-mite destroyer
- Lacewing larvae

2009 Crop Cycle



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Biological Control of OFM: *Macrocentrus ancylivorus*

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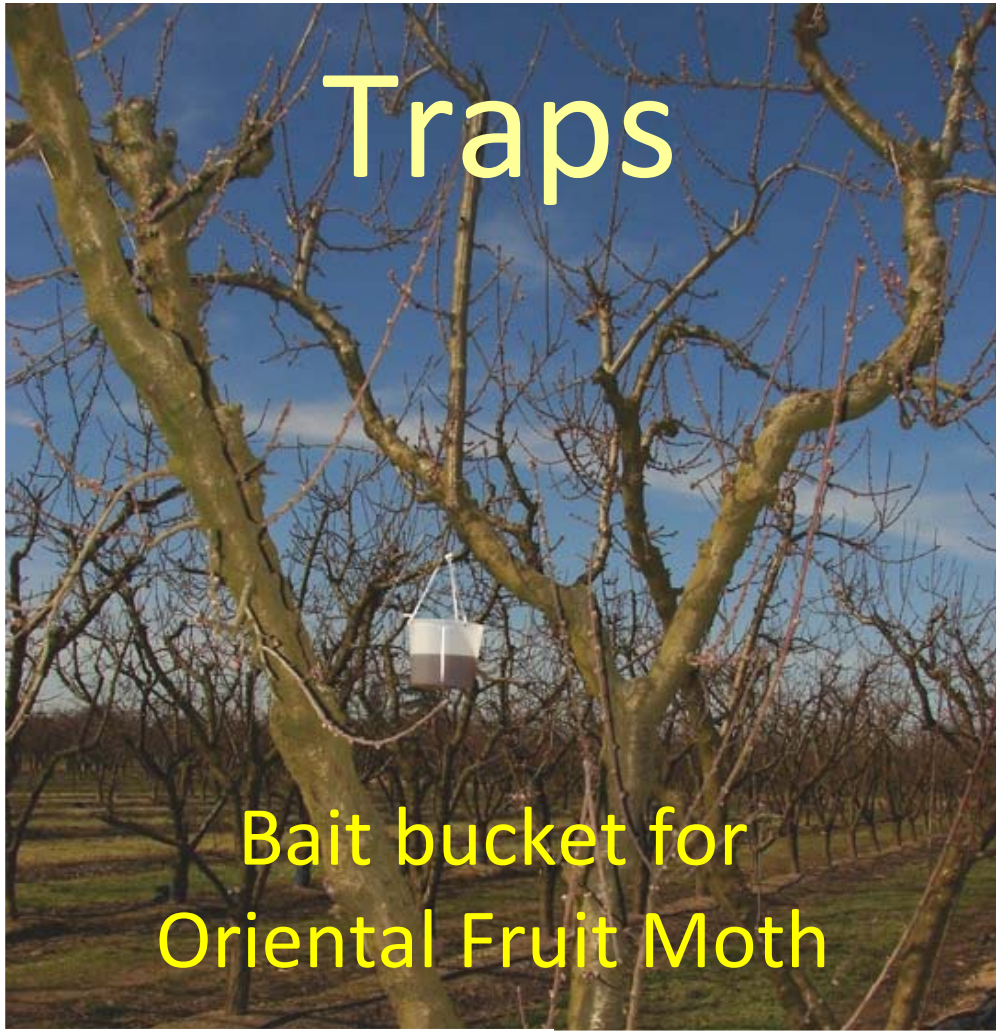
Natural Enemies of Pests in Peach Orchards

- Predators & Parasitoids
  - Green lacewings
  - Ladybugs
  - Hover flies
  - Assassin bugs
  - Parasitic flies (tachinid flies)
  - Parasitic wasps
  - California gray ant

Traps

San Jose Scale


Bait bucket for
Oriental Fruit Moth

Delta pheromone trap for
4 moth species

PHEROMONE TRAPS

OLR

OFM

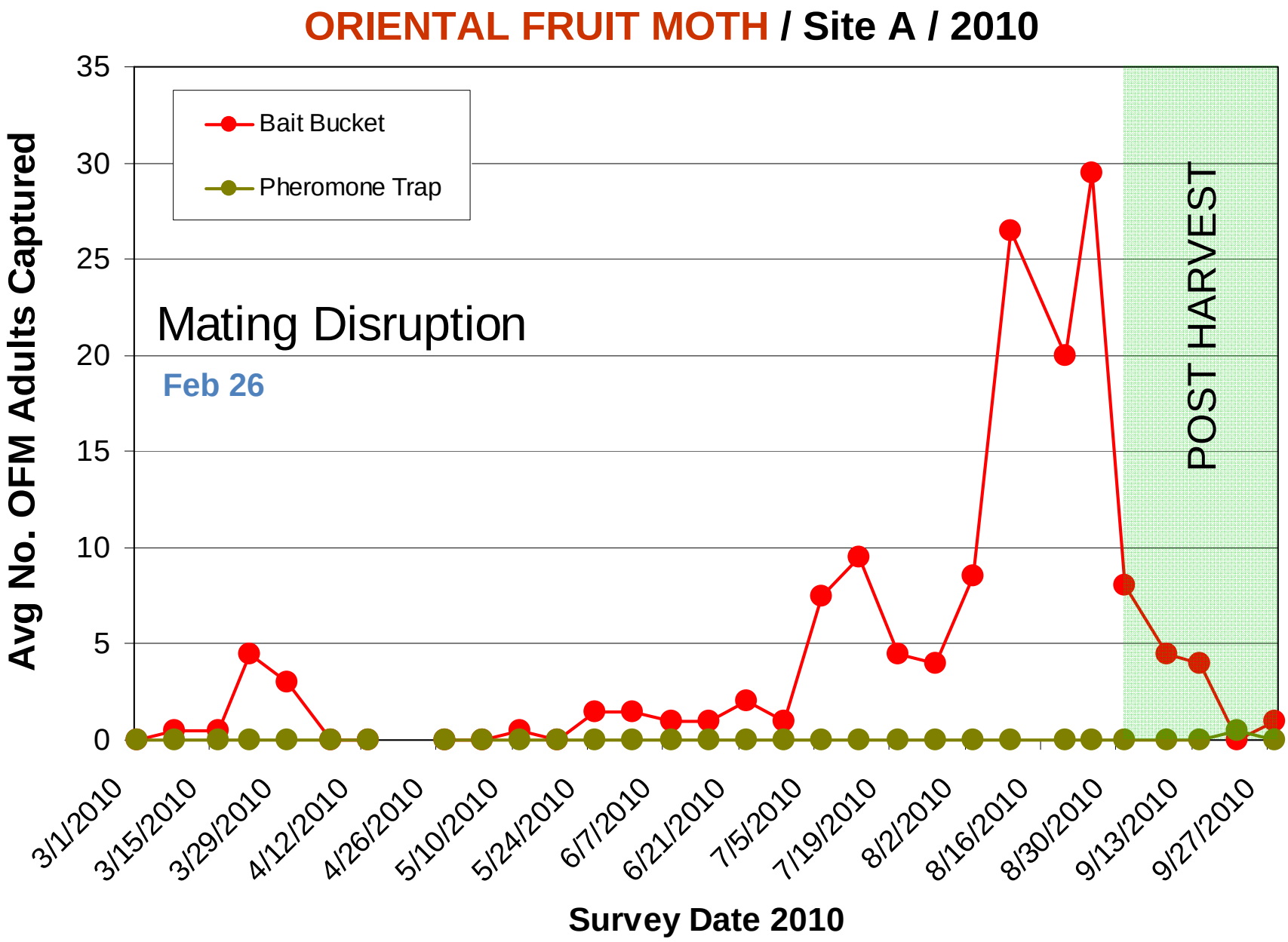
OBLR

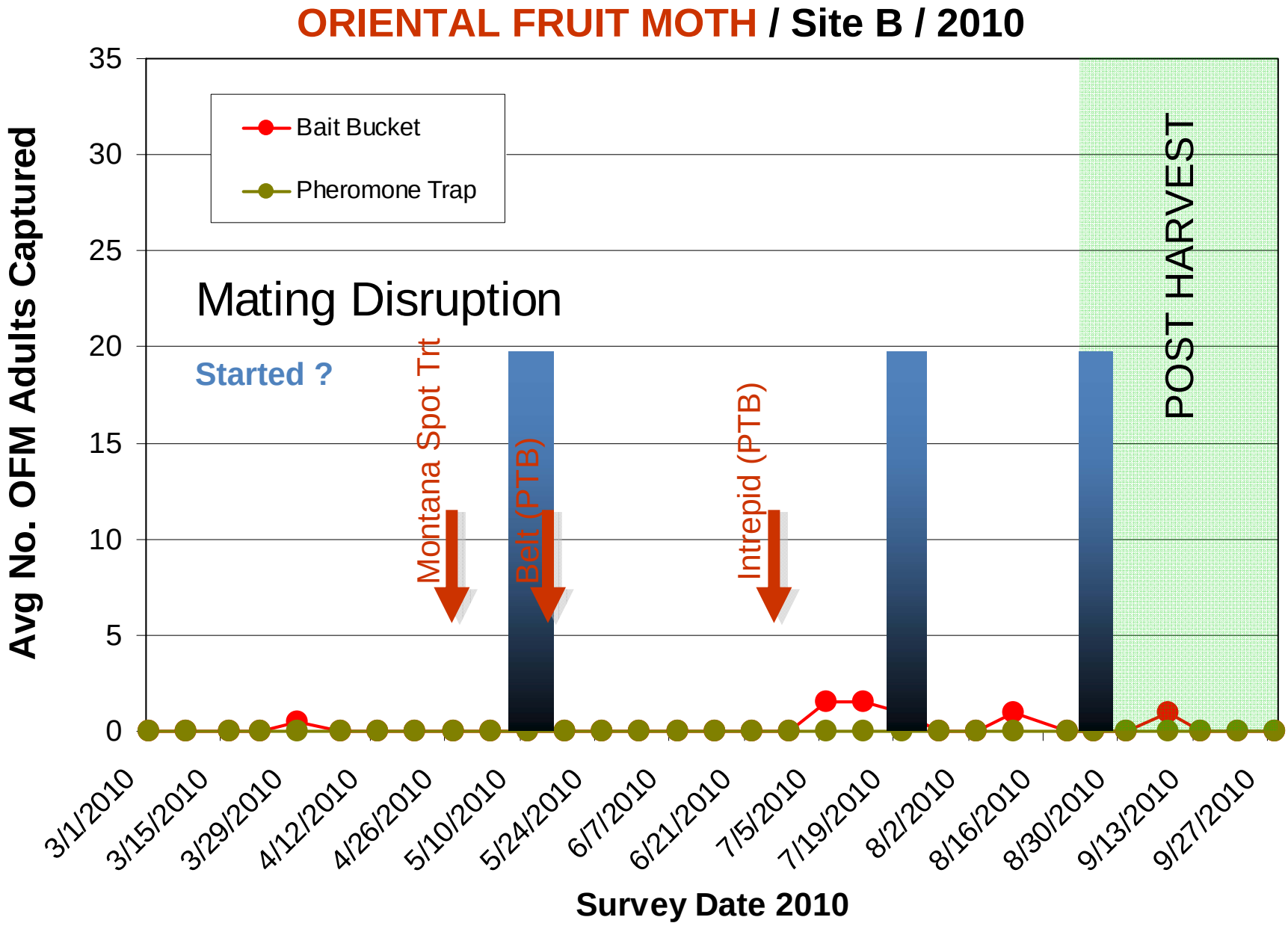
Damage to Leaf Shoot Terminals

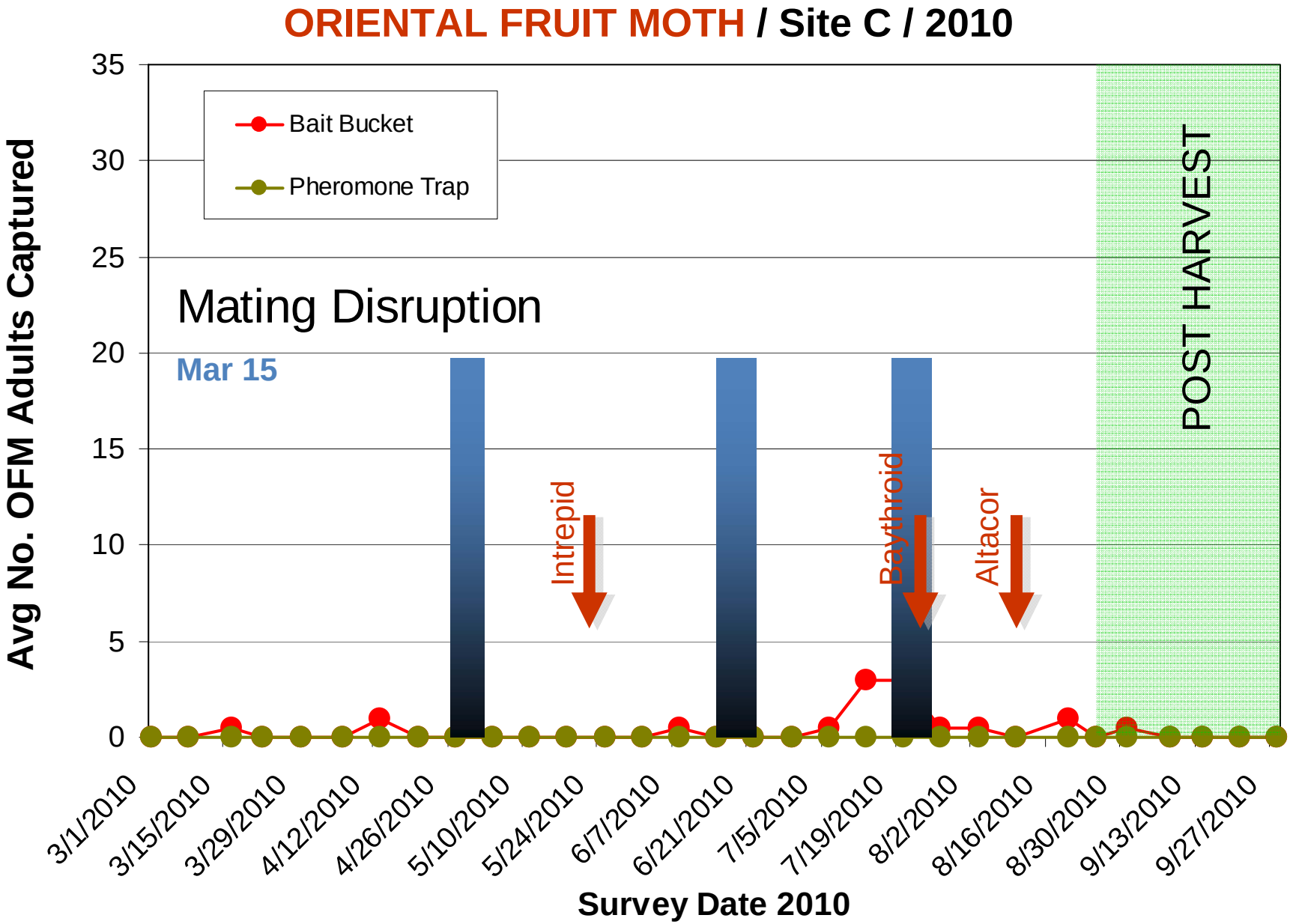
Damage to Fruit Caused by Larva

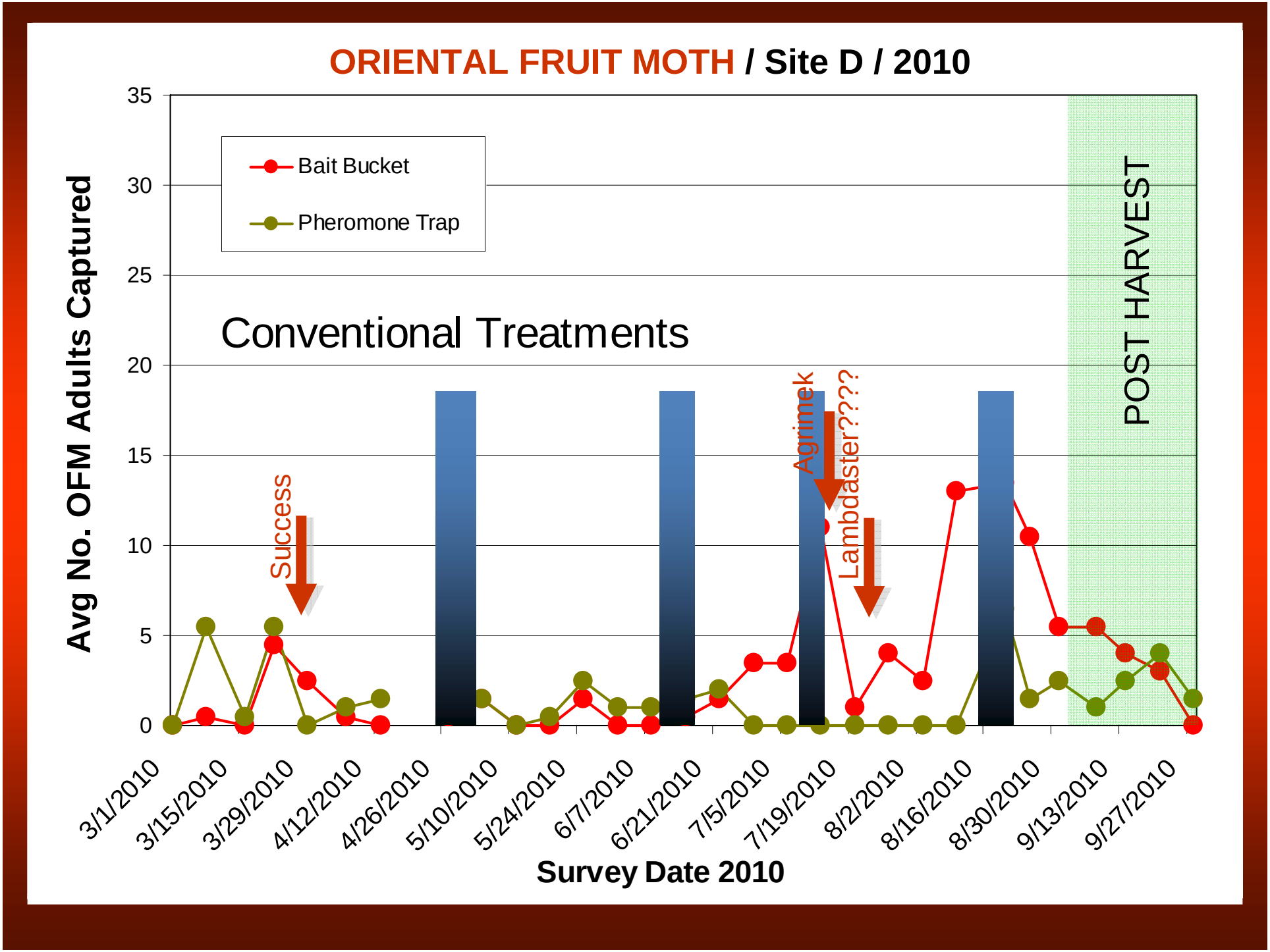
Hanging Isomate TT for Oriental Fruit Moth Mating Disruption

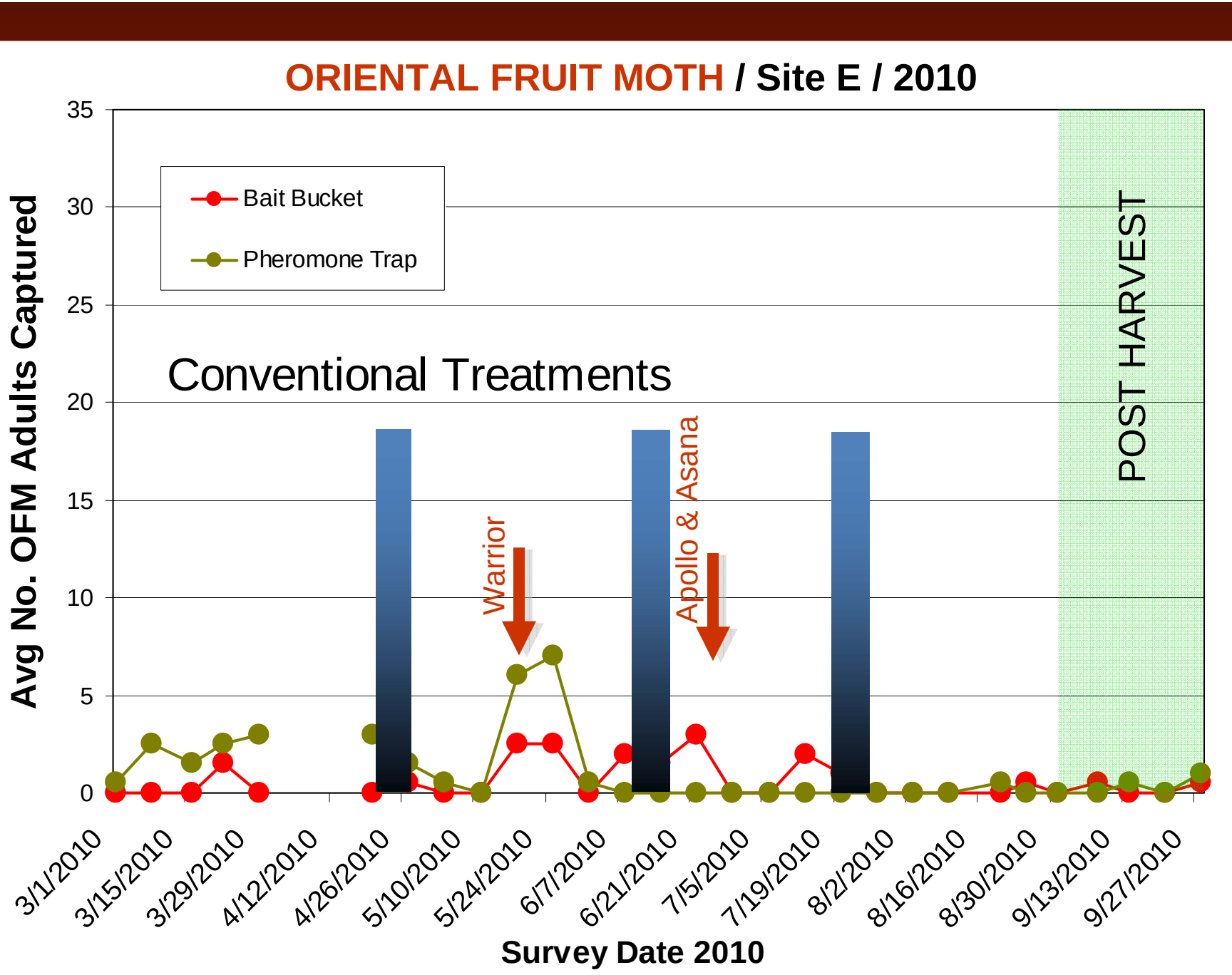
- By March 1 in northern San Joaquin Valley

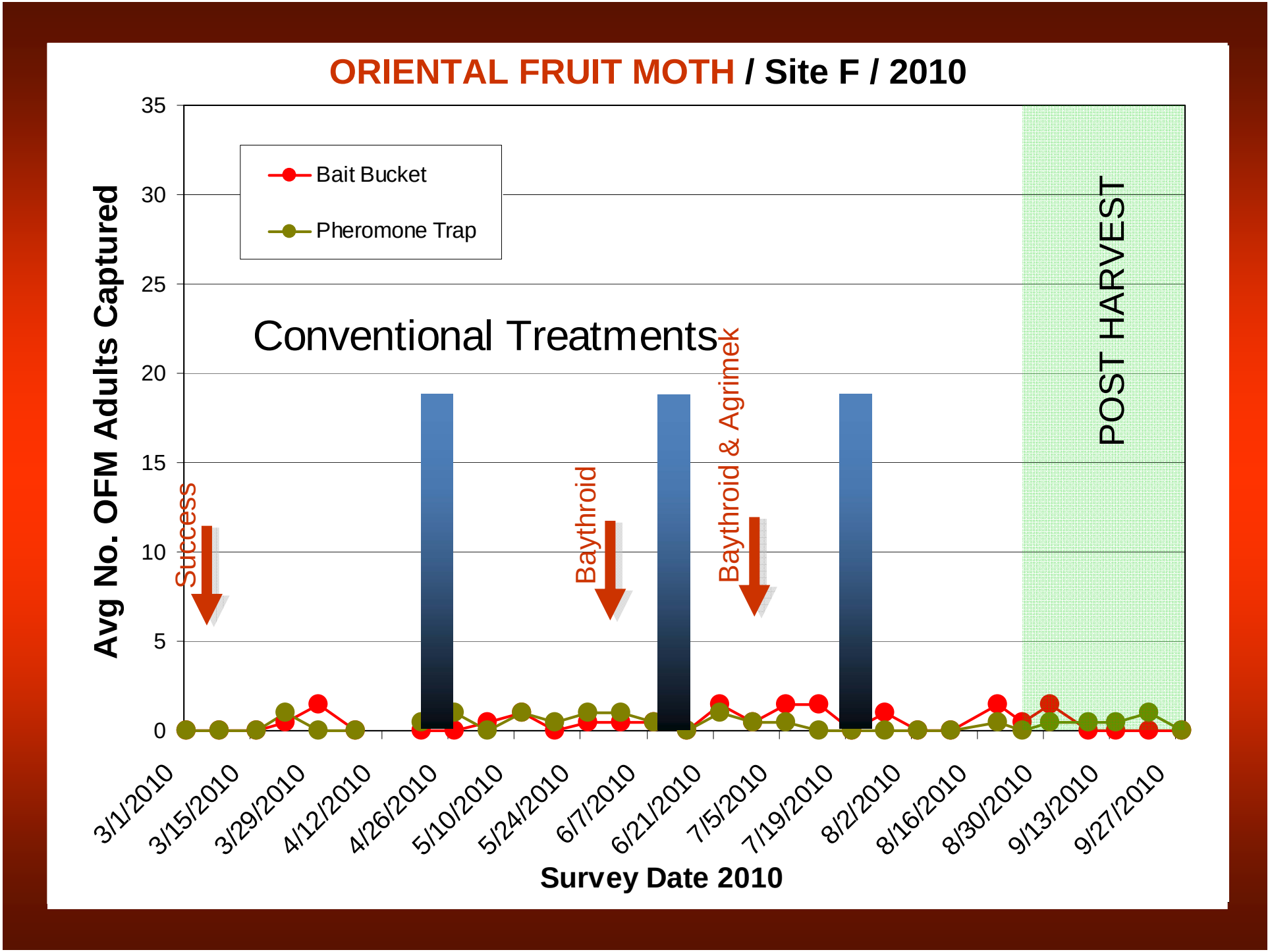

ORIENTAL FRUIT MOTH / Site A / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption
Feb 26
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010

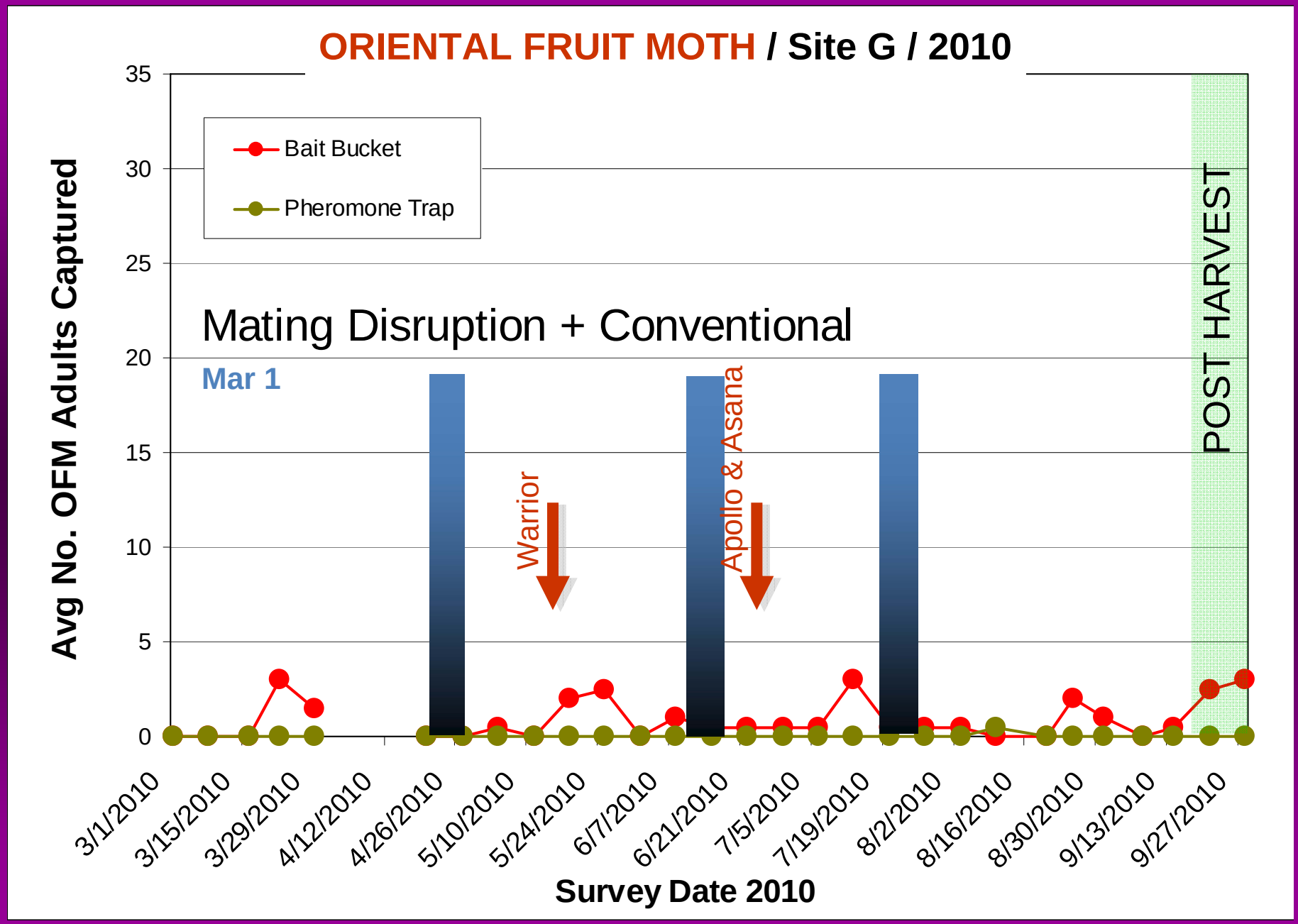

ORIENTAL FRUIT MOTH / Site B / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption
Started ?
Montana Spot Trt
Belt (PTB)
Intrepid (PTB)
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010

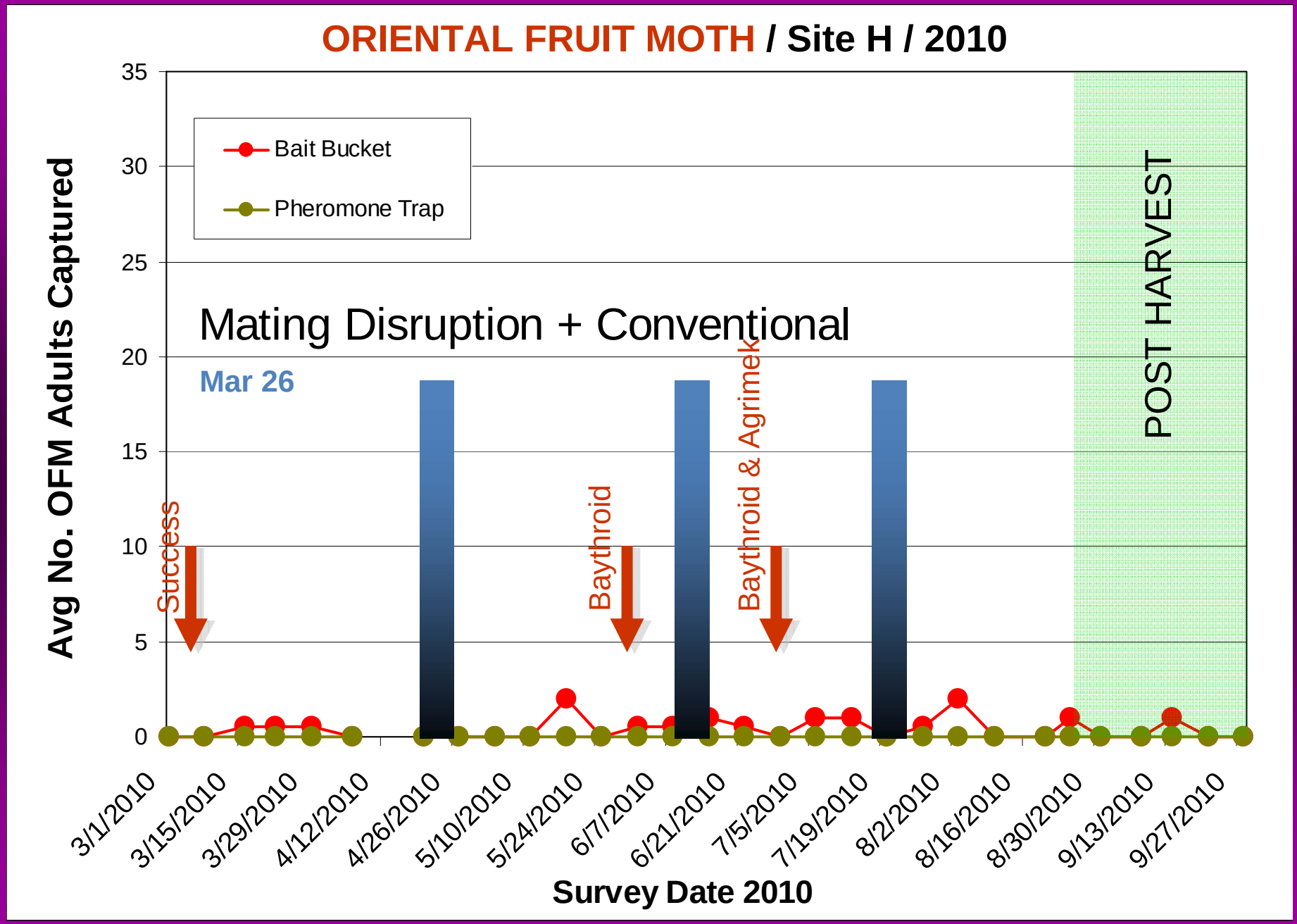

ORIENTAL FRUIT MOTH / Site C / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption
Mar 15
Intrepid
Baythroid
Altacor
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010

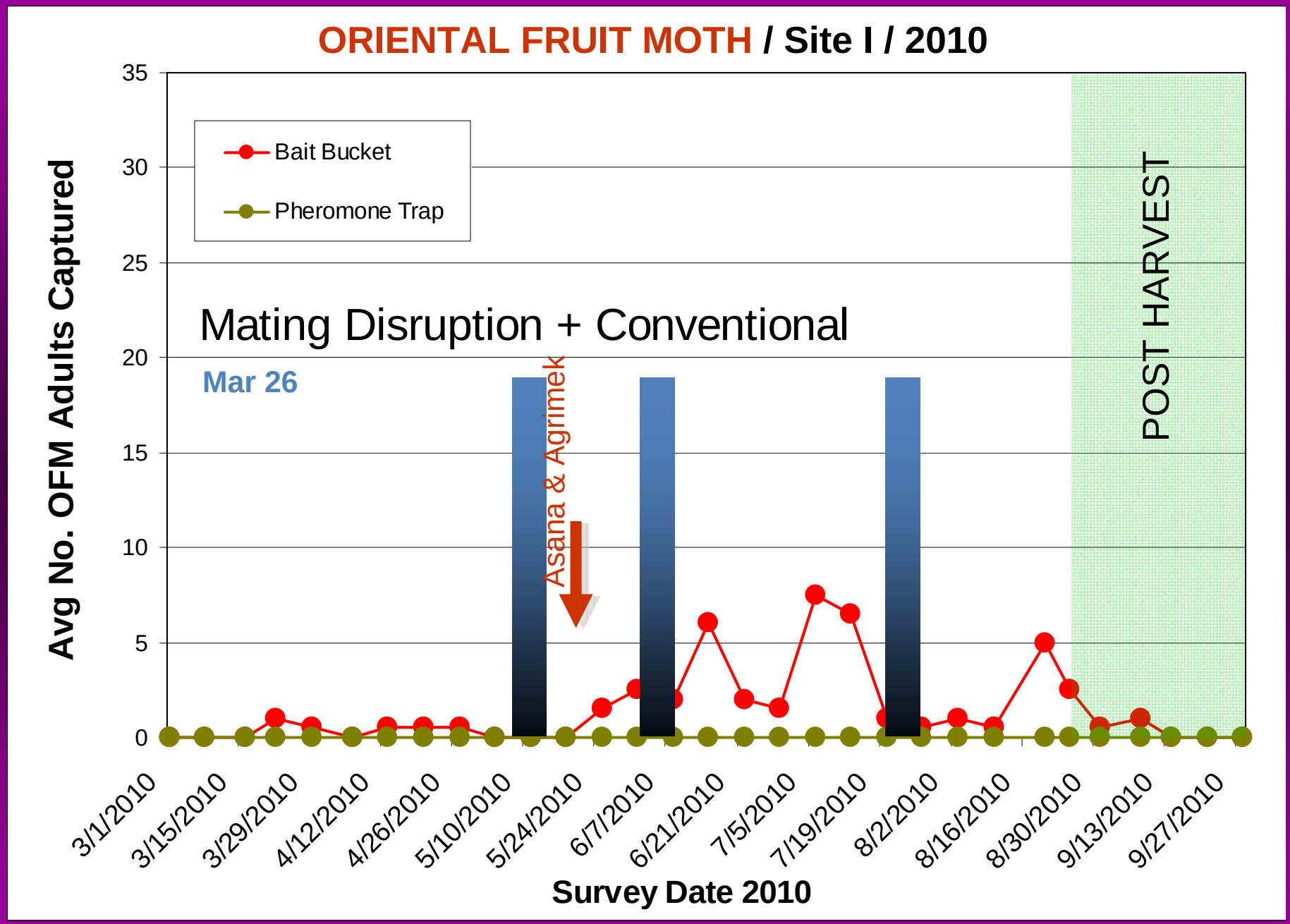

ORIENTAL FRUIT MOTH / Site D / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Conventional Treatments
POST HARVEST
Success
Agrimek
Lambdaster????
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010

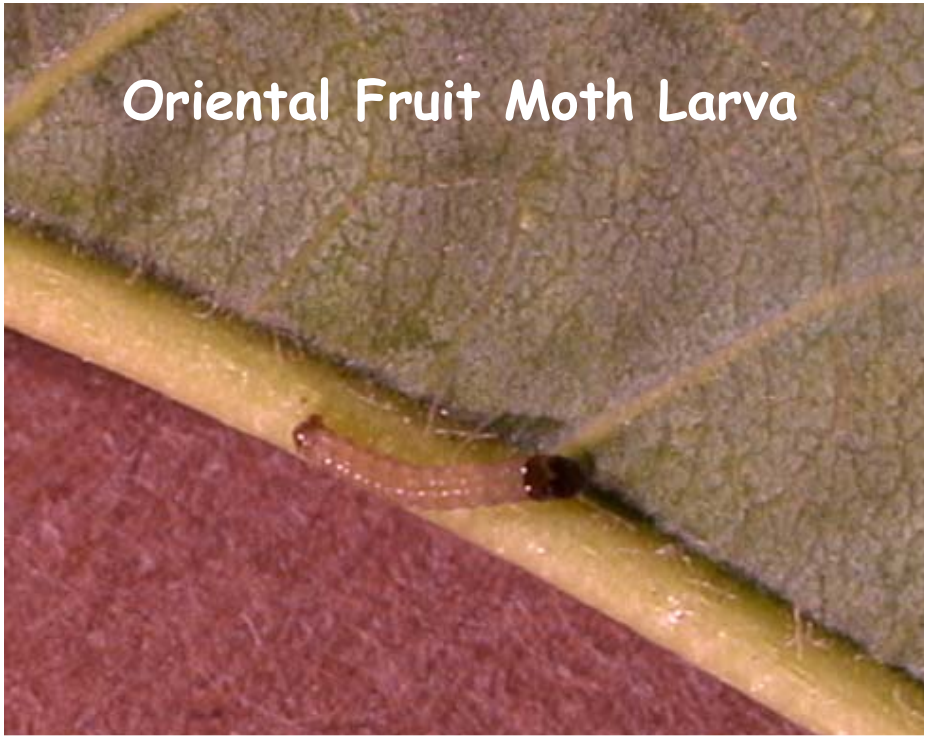

ORIENTAL FRUIT MOTH / Site E / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Conventional Treatments
Warrior
Apollo & Asana
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010


ORIENTAL FRUIT MOTH / Site F / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Conventional Treatments
Success
Baythroid
Baythroid & Agrimek
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010


ORIENTAL FRUIT MOTH / Site G / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption + Conventional
Mar 1
Warrior
Apollo & Asana
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010

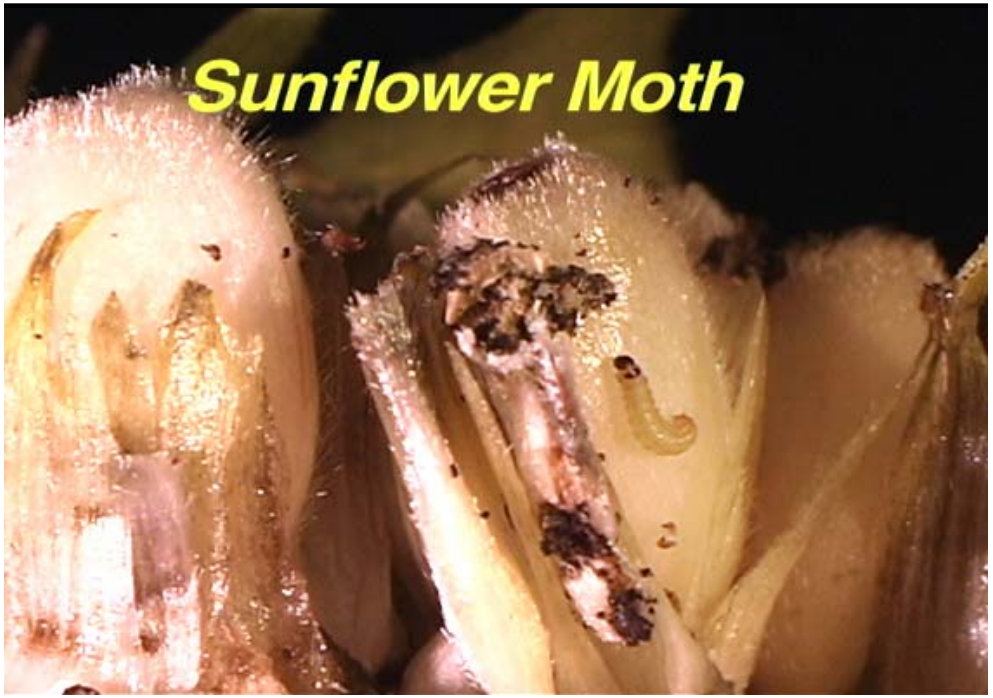

ORIENTAL FRUIT MOTH / Site H / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption + Conventional
Mar 26
Success
Baythroid
Baythroid & Agrimek
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010


ORIENTAL FRUIT MOTH / Site I / 2010
Avg No. OFM Adults Captured
35
30
25
20
15
10
5
0
Bait Bucket
Pheromone Trap
Mating Disruption + Conventional
Mar 26
Asana & Agrimek
POST HARVEST
3/1/2010
3/15/2010
3/29/2010
4/12/2010
4/26/2010
5/10/2010
5/24/2010
6/7/2010
6/21/2010
7/5/2010
7/19/2010
8/2/2010
8/16/2010
8/30/2010
9/13/2010
9/27/2010
Survey Date 2010


Oriental Fruit Moth Larva

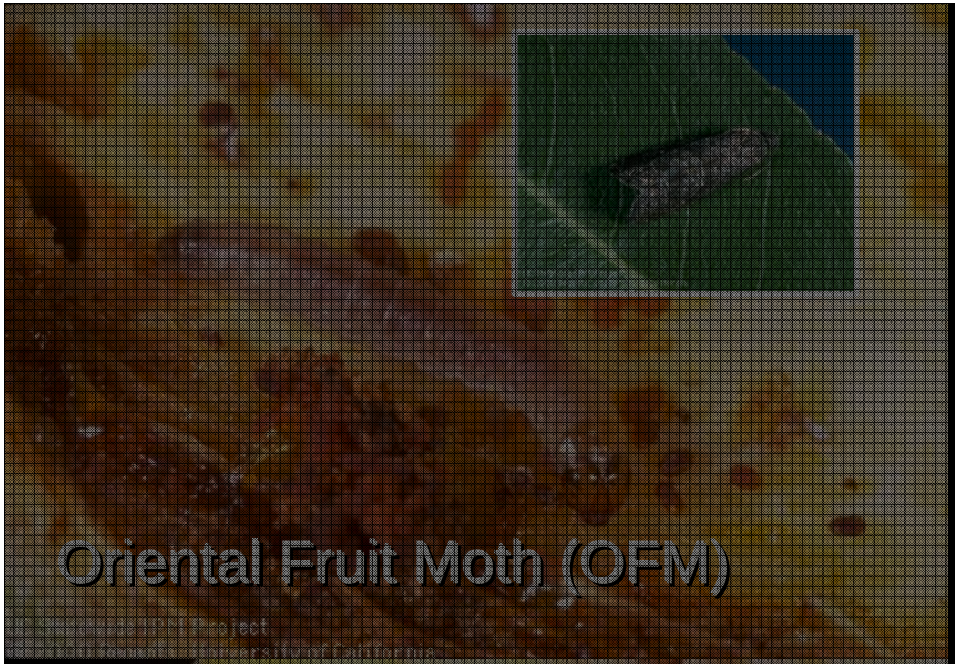
Walter Bentley

Macrocentrus ancylivorus adult

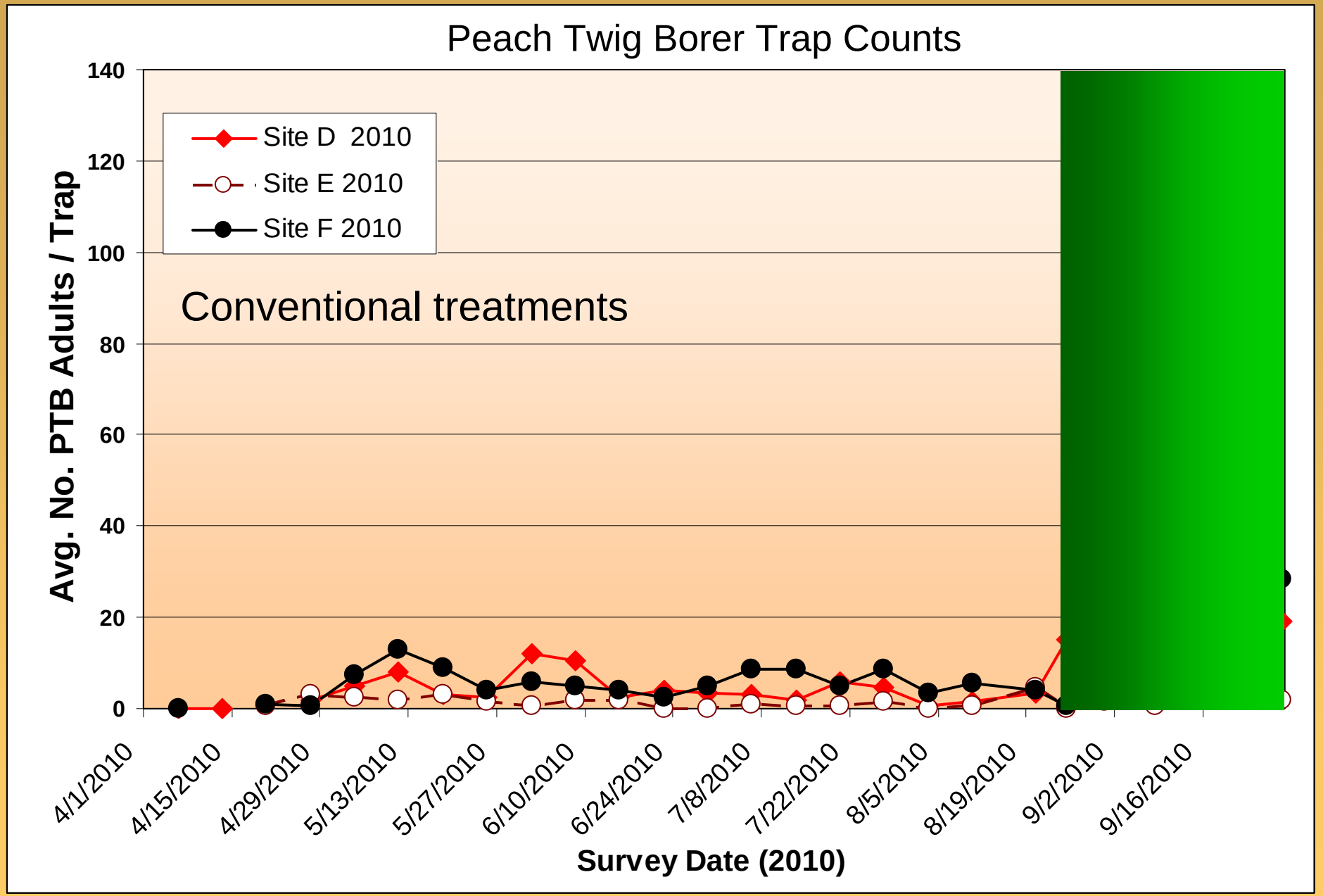

Sunflower Moth

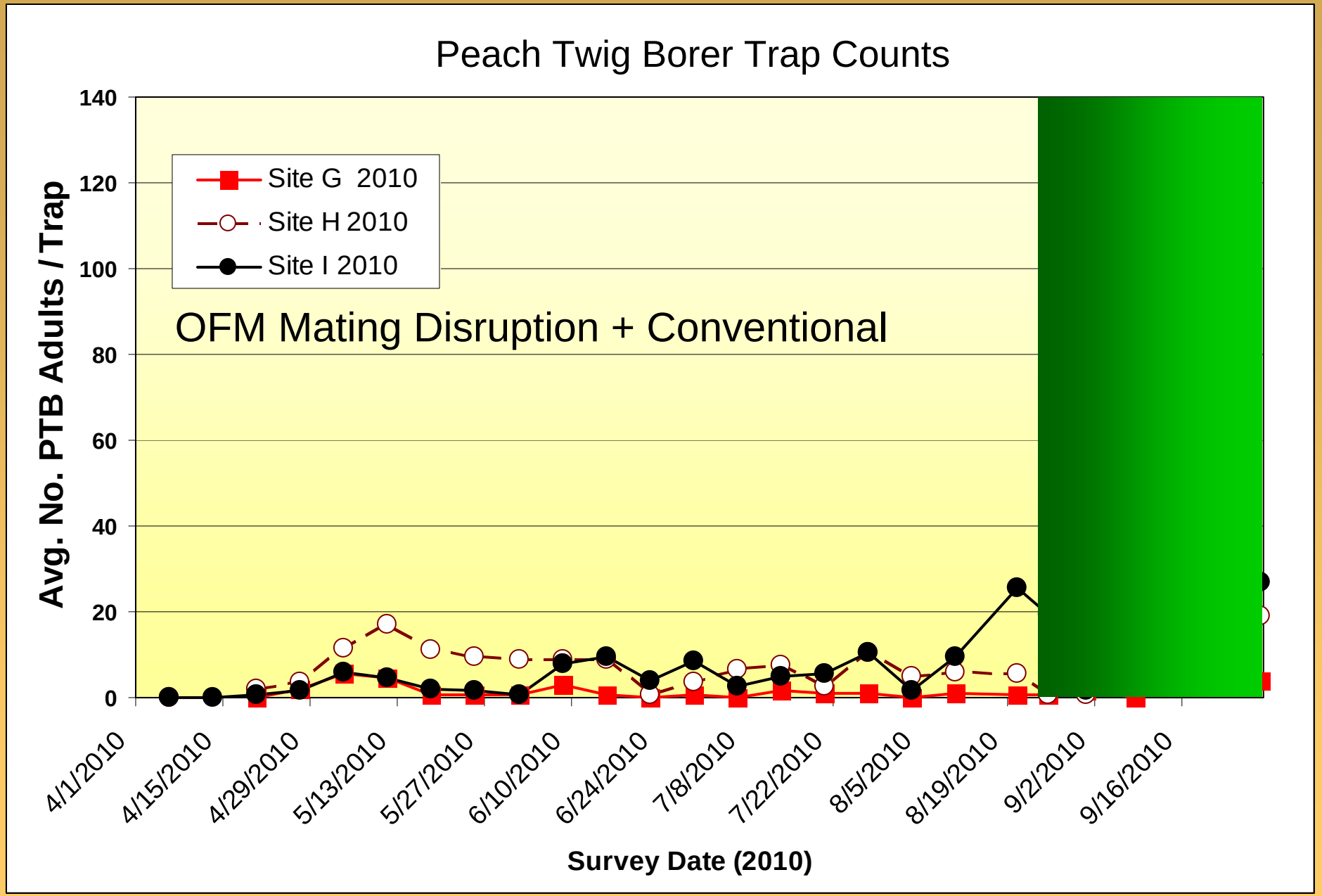
Extend drip line at end of row

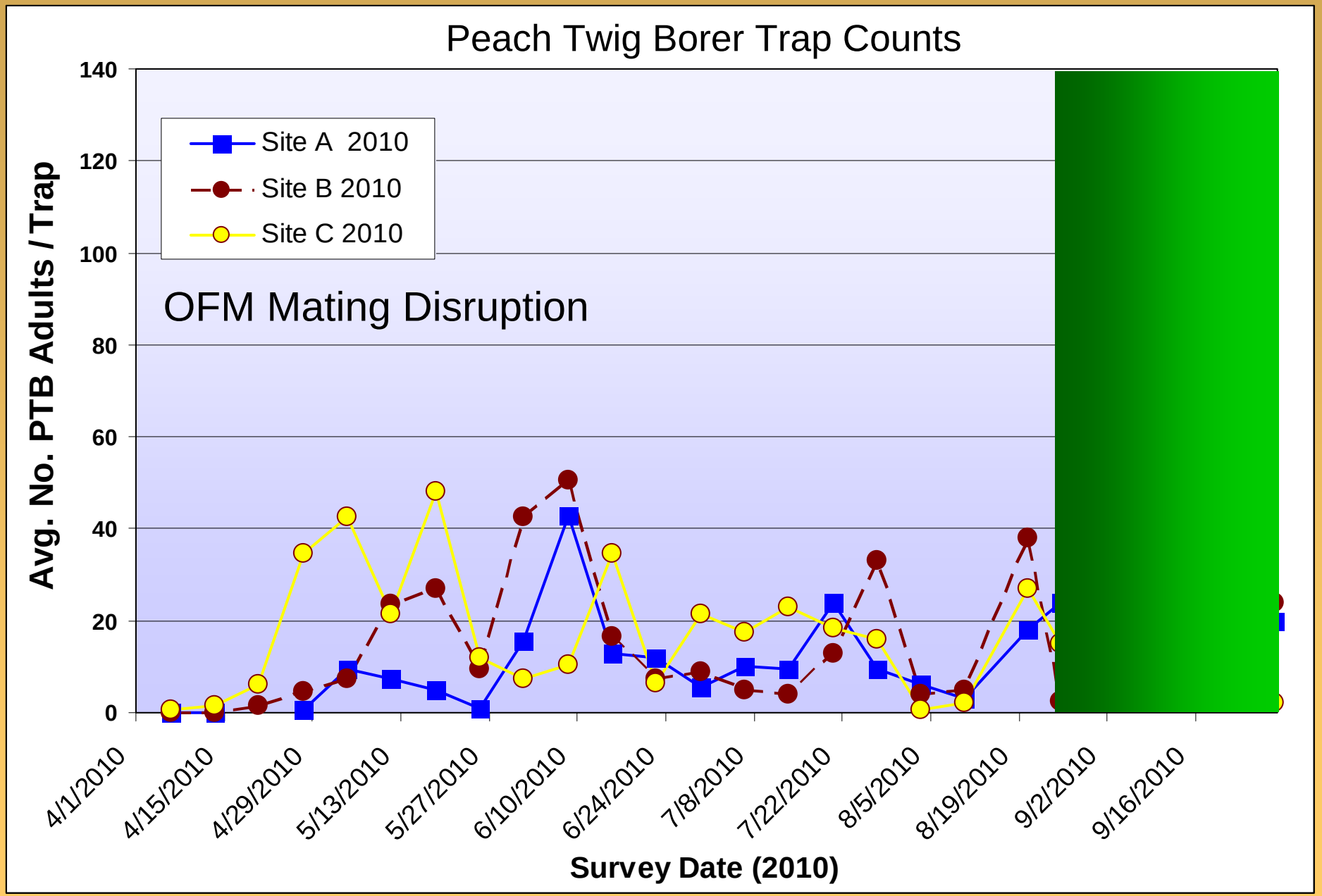
Extend drip line along road

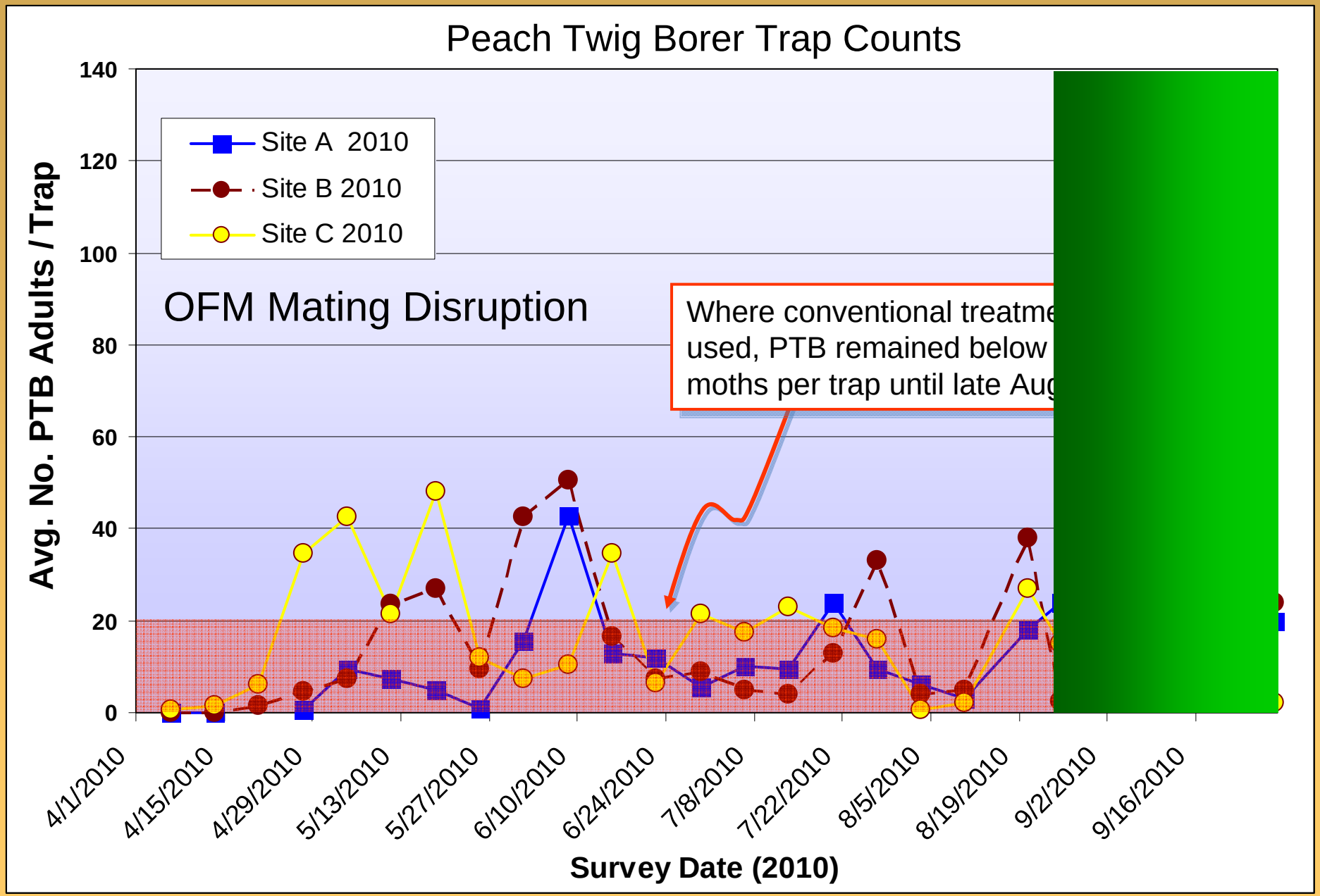


Damage to Fruit Caused by Larva

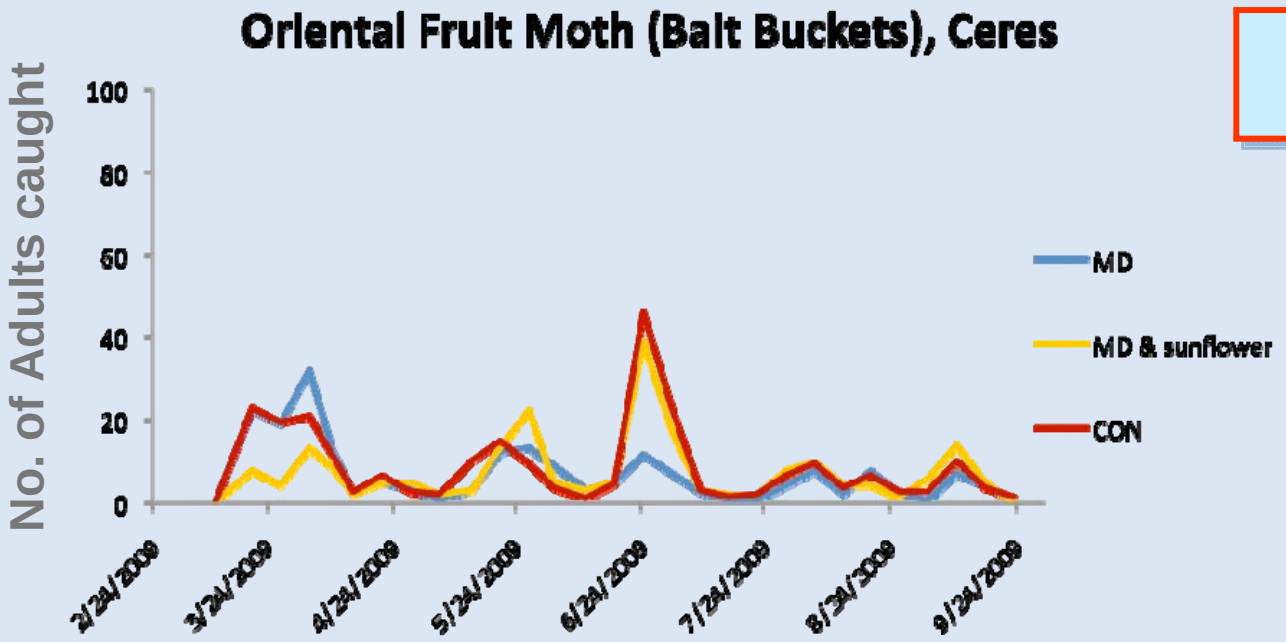

Peach Twig Borer Trap Counts
Site D 2010
Site E 2010
Site F 2010
Conventional treatments
Avg. No. PTB Adults / Trap
140
120
100
80
60
40
20
0
4/1/2010
4/15/2010
4/29/2010
5/13/2010
5/27/2010
6/10/2010
6/24/2010
7/8/2010
7/22/2010
8/5/2010
8/19/2010
9/2/2010
9/16/2010
Survey Date (2010)


Peach Twig Borer Trap Counts
Site G 2010
Site H 2010
Site I 2010
OFM Mating Disruption + Conventional
Avg. No. PTB Adults / Trap
140
120
100
80
60
40
20
0
4/1/2010
4/15/2010
4/29/2010
5/13/2010
5/27/2010
6/10/2010
6/24/2010
7/8/2010
7/22/2010
8/5/2010
8/19/2010
9/2/2010
9/16/2010
Survey Date (2010)


Peach Twig Borer Trap Counts
Site A 2010
Site B 2010
Site C 2010
OFM Mating Disruption
Avg. No. PTB Adults / Trap
140
120
100
80
60
40
20
0
4/1/2010
4/15/2010
4/29/2010
5/13/2010
5/27/2010
6/10/2010
6/24/2010
7/8/2010
7/22/2010
8/5/2010
8/19/2010
9/2/2010
9/16/2010
Survey Date (2010)

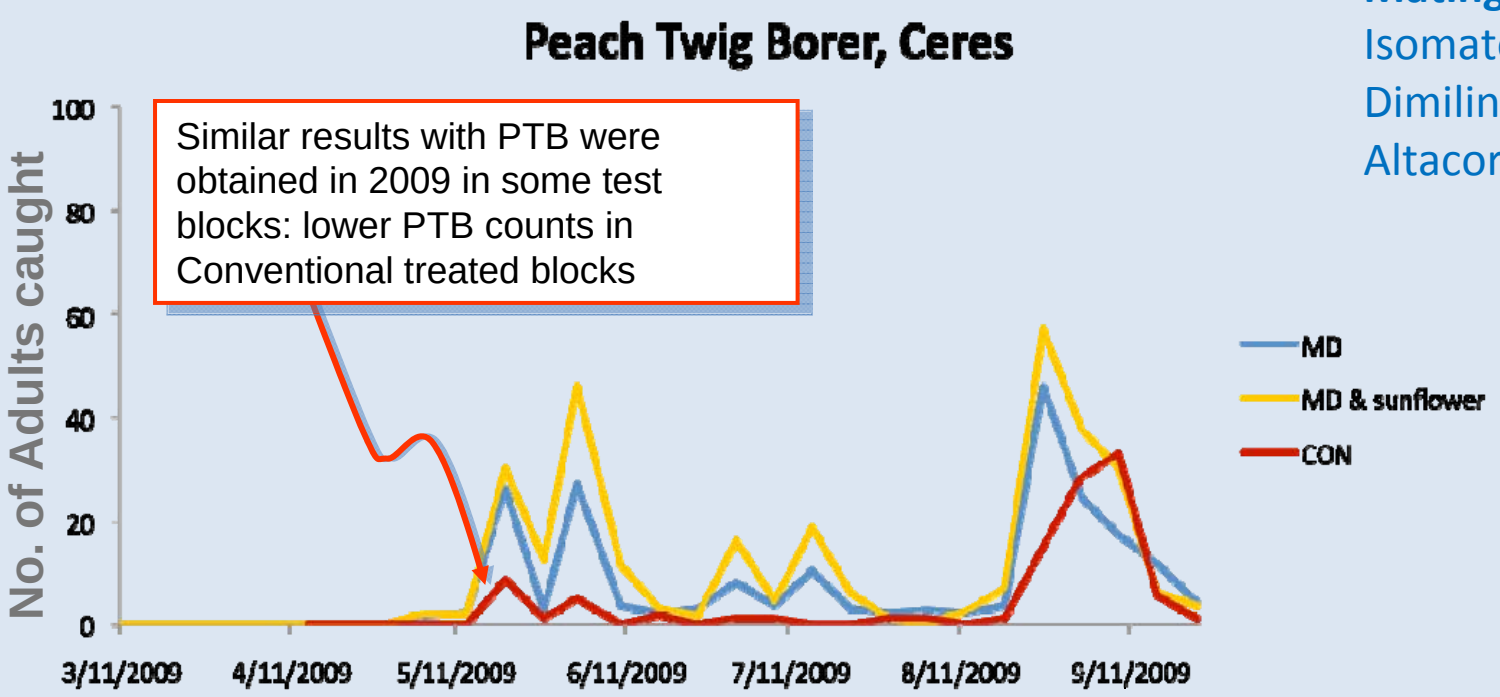

Peach Twig Borer Trap Counts
Site A 2010
Site B 2010
Site C 2010
OFM Mating Disruption
Where conventional treatme
used, PTB remained below
moths per trap until late Aug
Avg. No. PTB Adults / Trap
140
120
100
80
60
40
20
0
4/1/2010
4/15/2010
4/29/2010
5/13/2010
5/27/2010
6/10/2010
6/24/2010
7/8/2010
7/22/2010
8/5/2010
8/19/2010
9/2/2010
9/16/2010
Survey Date (2010)

2009 Crop Cycle



Conventional
Dimilin 2/26, 3/3
Intrepid 4/13
Silencer 5/23
Altacor 7/1

Mating Disruption
Isomate 2/27
Dimilin 2/28, 3/3
Altacor 7/1



Similar results with PTB were obtained in 2009 in some test blocks: lower PTB counts in Conventional treated blocks

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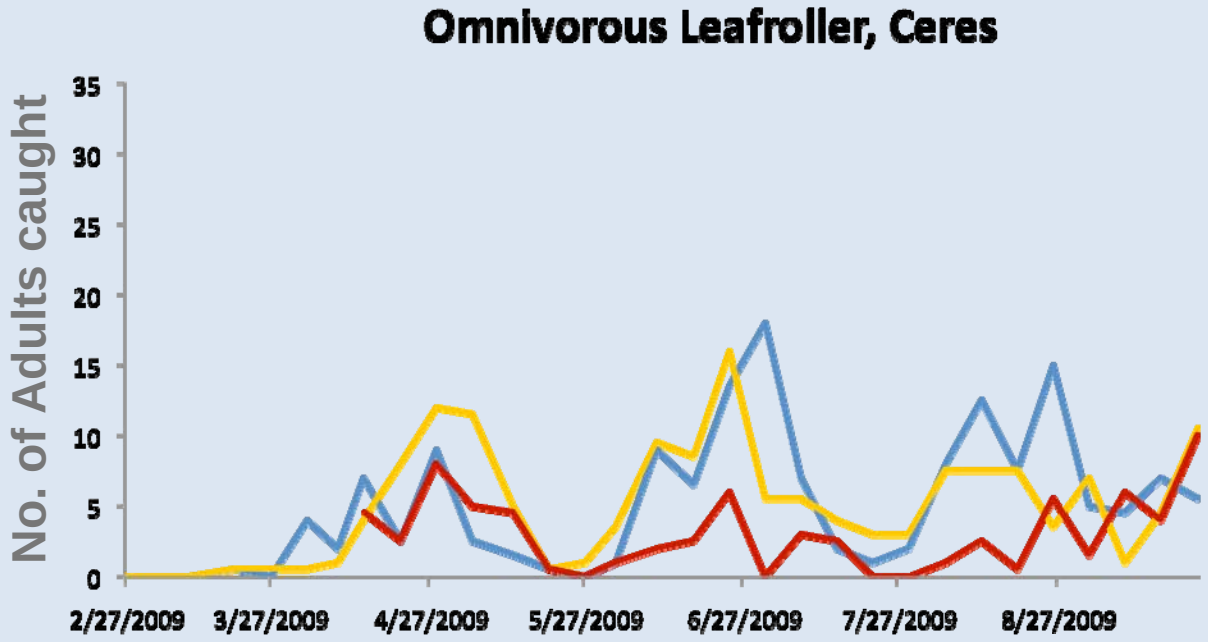
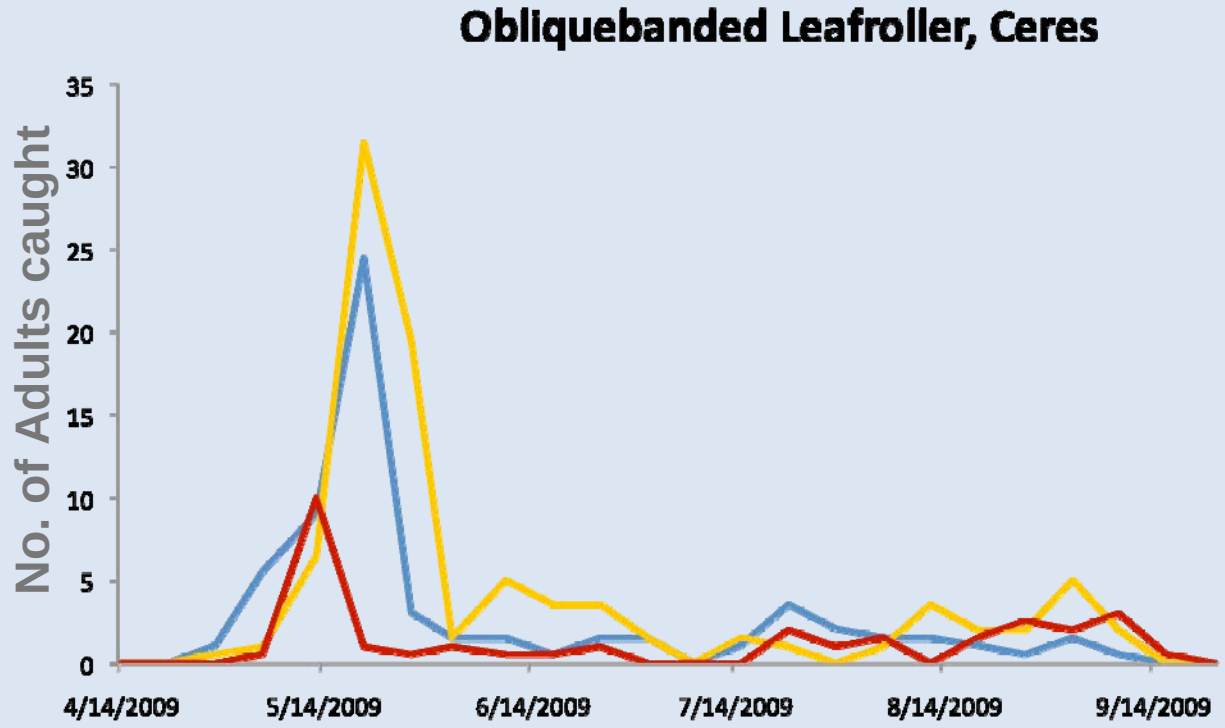
QUESTIONS ANYONE?

2009 Crop Cycle



Conventional
Dimilin 2/26, 3/3
Intrepid 4/13
Silencer 5/23
Altacor 7/1



Mating Disruption
Isomate 2/27
Dimilin 2/28, 3/3
Altacor 7/1