

Developing Biologically Integrated Orchard
Systems & Corresponding Market Certification
Reward for Canning Peaches
in the San Joaquin Valley
(A Canning Peach Pest Management Alliance)

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Insects and Mites in 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



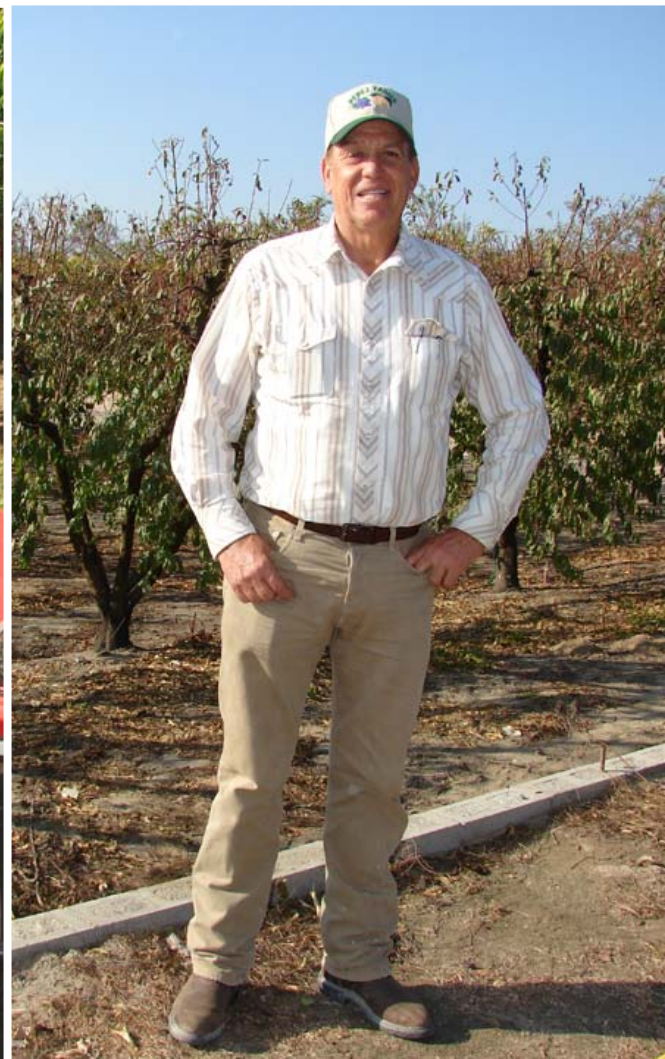
Seasonal Guide to Environmentally Responsible Pest Management Practices in Peaches and Nectarines

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The **Seasonal Fruit Pest Management (SFPMA)** is a public-private partnership to facilitate the dissemination of
environmentally responsible pest management practices for managing common pests in peaches and nectarines. The
partnership includes the California Insect Agreement, the California Citrus Insect Board, UCCE Farm Advisors and IPM
Advisors, the California Department of Pesticide Regulation and the U.S. Environmental Protection Agency (EPA) Region 9.

We found several willing growers



Thanks to:

- Glenn Arnold
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- John Johnston
- Harvinder Kullar
- Sid & Scott Long
- Garret Nydam
- José Perez
- Lonnie Slaton
- Bill Thompson
- Blaine & Ben Yagi

Outline

- Demonstration plots
- Treatment plan
- Summary of results
 - San Jose scale
 - Moths: oriental fruit moth, peach twig borer, oblique-banded leafroller, omnivorous leafroller
 - Spider mites
 - *Macrocentrus* and other natural enemies

Treatment Plan

- Mating Disruption Plots:
 - UC's Seasonal Guide to Environmentally Responsible Pest management Practices in Peaches and Nectarines (monitor, treat with soft pesticides if needed, etc.)
 - Isomate TT mating disruption product for Oriental Fruit Moth (6 months efficacy)
- Conventional Plots:
 - As before (broad spectrum pesticides, etc.)

Insects and Mites Monitored

- San Jose Scale and its natural enemies
- Oriental fruit moth
- Peach twig borer
- Oblique-banded leafroller
- Omnivorous leafroller
- Spider mites and their predators
- Sunflower moth and *Macrocentrus*
- General orchard predators

Newport Rd

'Late Ross & 'Sullivan'



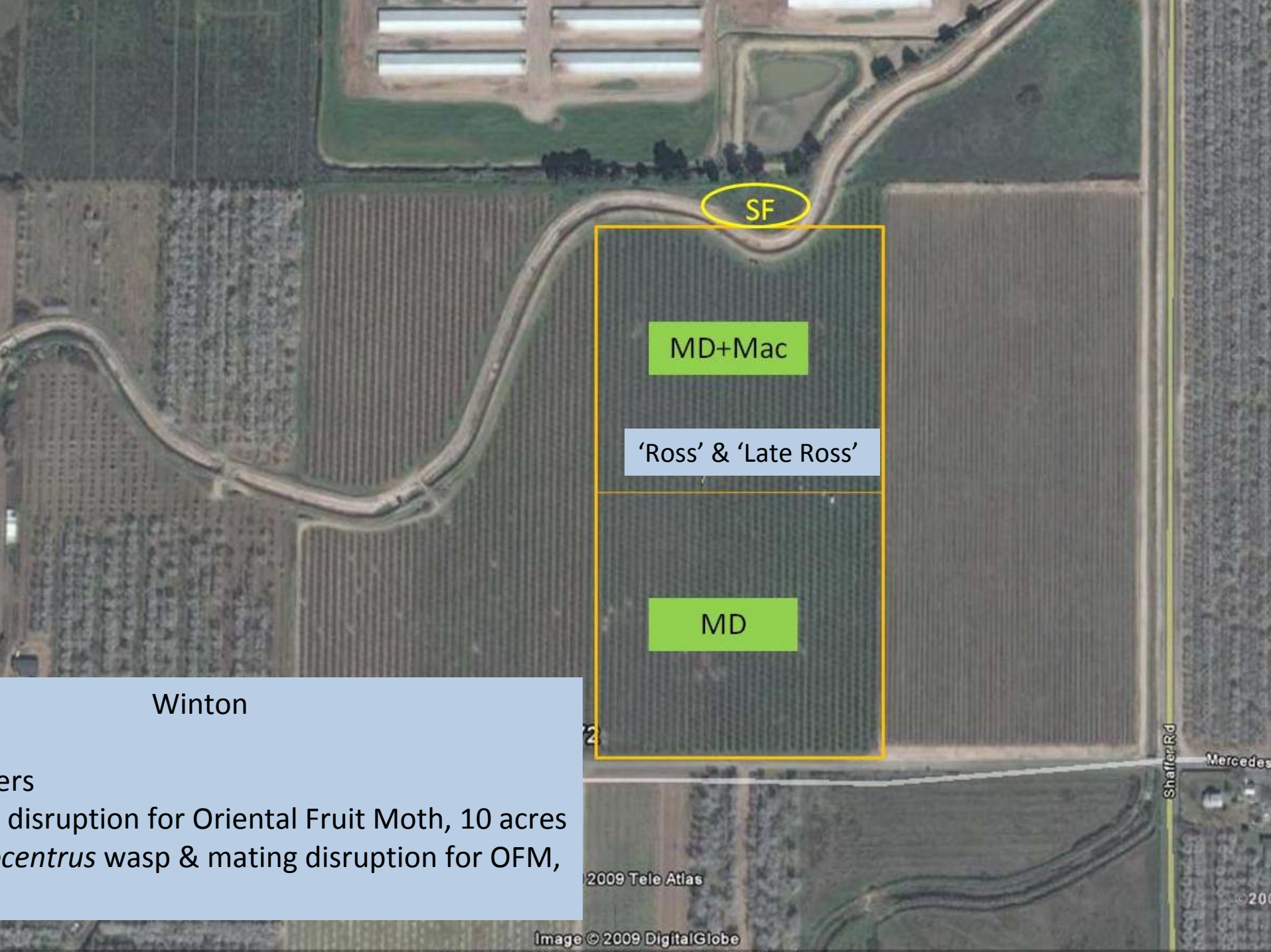
37.464806, -120.699611

CONV

MD

Ballico

Conventional pest management, 10 acres
causing disruption for Oriental fruit Moth, 10



SF

MD+Mac

'Ross' & 'Late Ross'

MD

Winton

ers
disruption for Oriental Fruit Moth, 10 acres
centrus wasp & mating disruption for OFM,

2009 Tele Atlas

Image © 2009 DigitalGlobe

Shaffer Rd

Mercedes

© 200

E Hatch Rd

37.609028, -120.910917

CONV

MD

'Riegel'

Ross block

MD+Mac

SF

Ceres

owers

ing disruption for Oriental Fruit Moth, 10 acres
microcentrus wasp & mating disruption for OFM, 10

ventional pest management, 5 acres

rvey

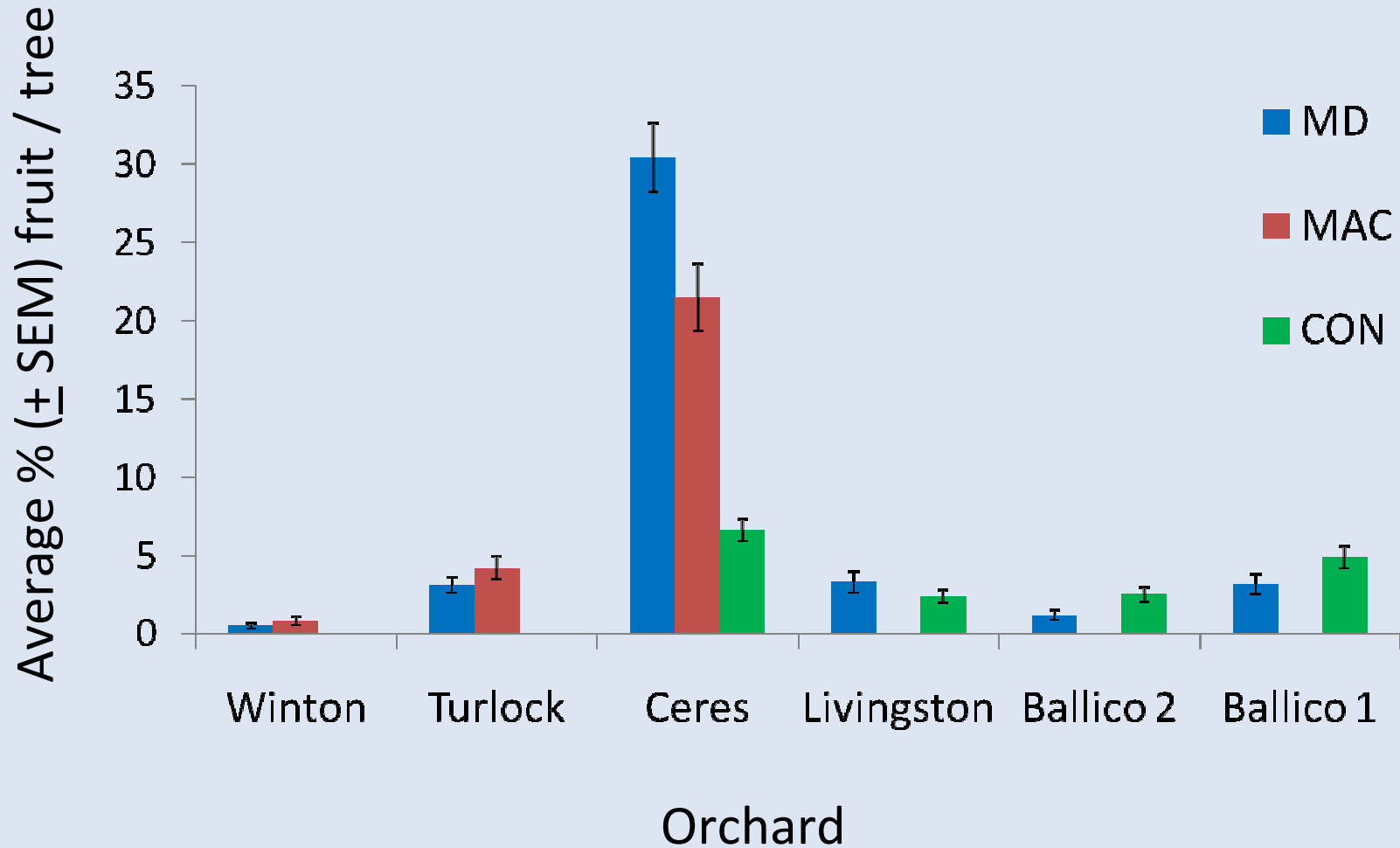
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Traps



Percent Fruit Damaged by Insects*

2009



50 fruit per tree examined on 20 trees per plot, 1-3 weeks before harvest

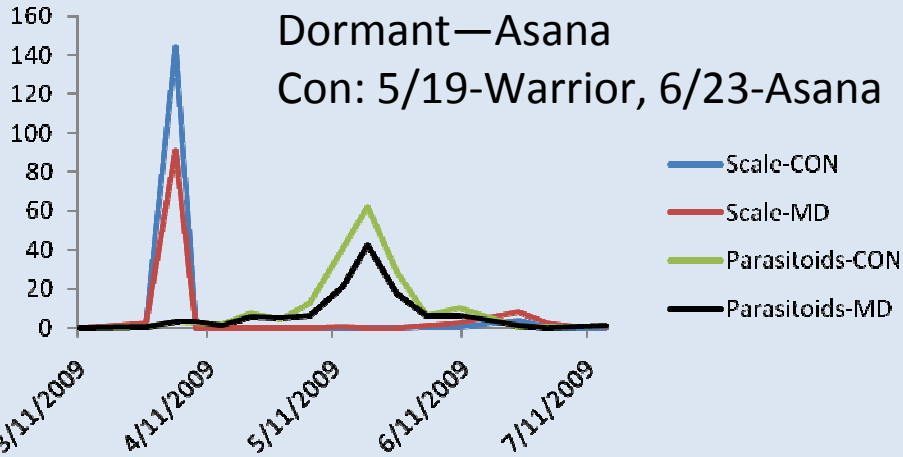
* Unidentified damage excluded

San Jose Scale and Natural Enemies

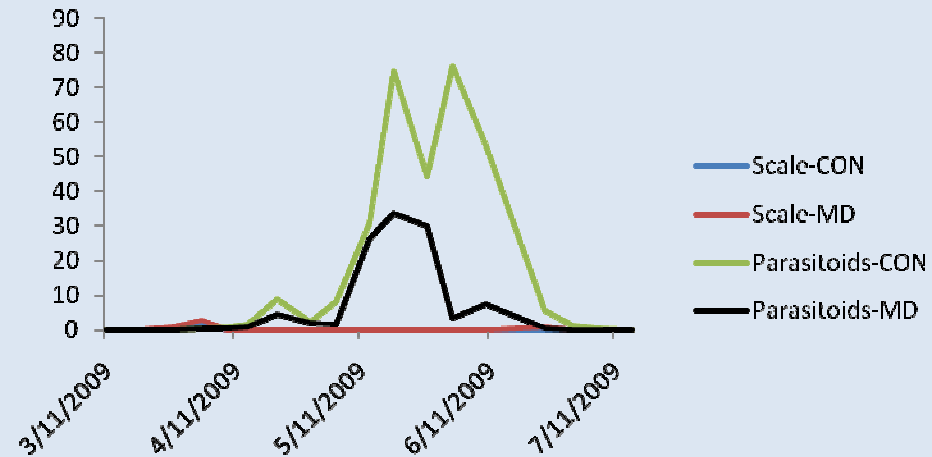
Conventional and Mating Disruption Plots

San Jose Scale and Parasitoids, Ballico-1

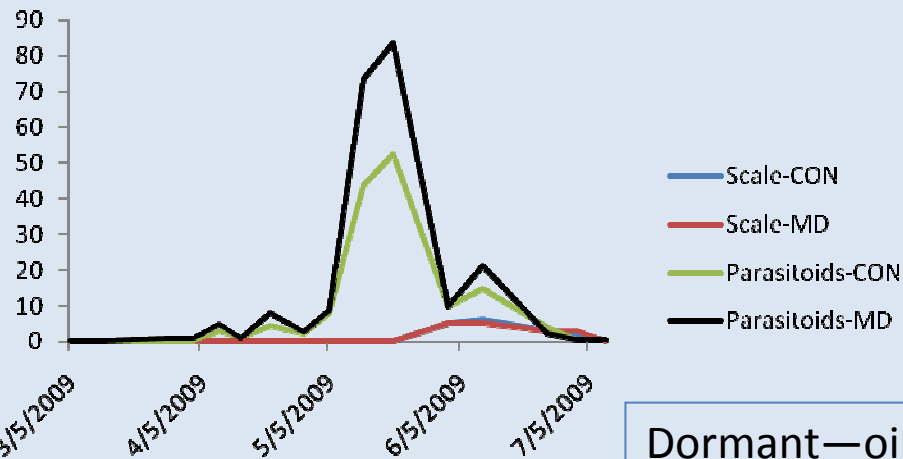
Dormant—Asana
 Con: 5/19-Warrior, 6/23-Asana



San Jose Scale and Parasitoids, Ballico-2



San Jose Scale and Parasitoids, Livingston

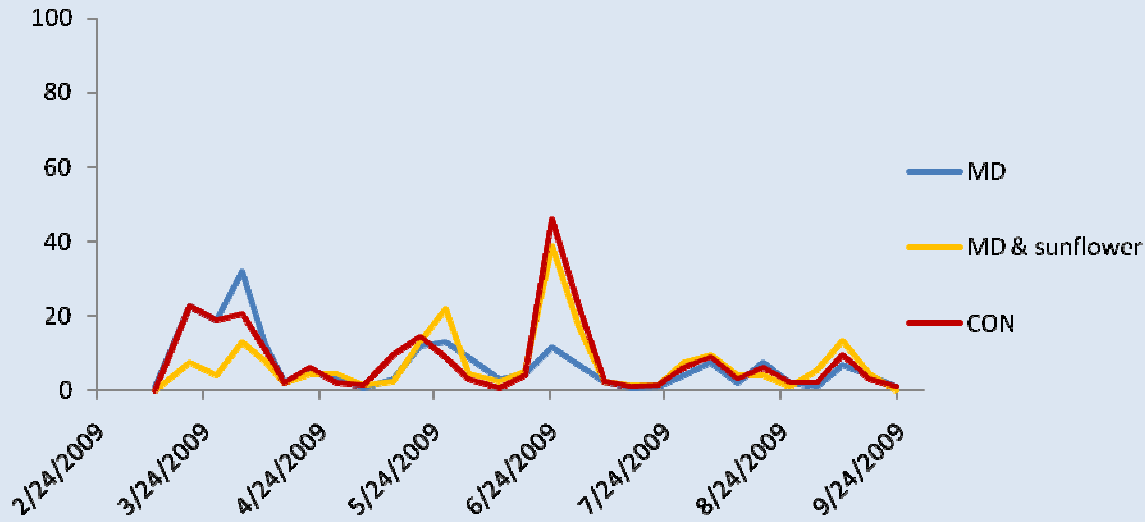


Dormant--oil,
 Asana
 5/23-Asana

Dormant—oil
 2/9—oil

No fruit damage due to
 scale

Oriental Fruit Moth (Bait Buckets), Ceres

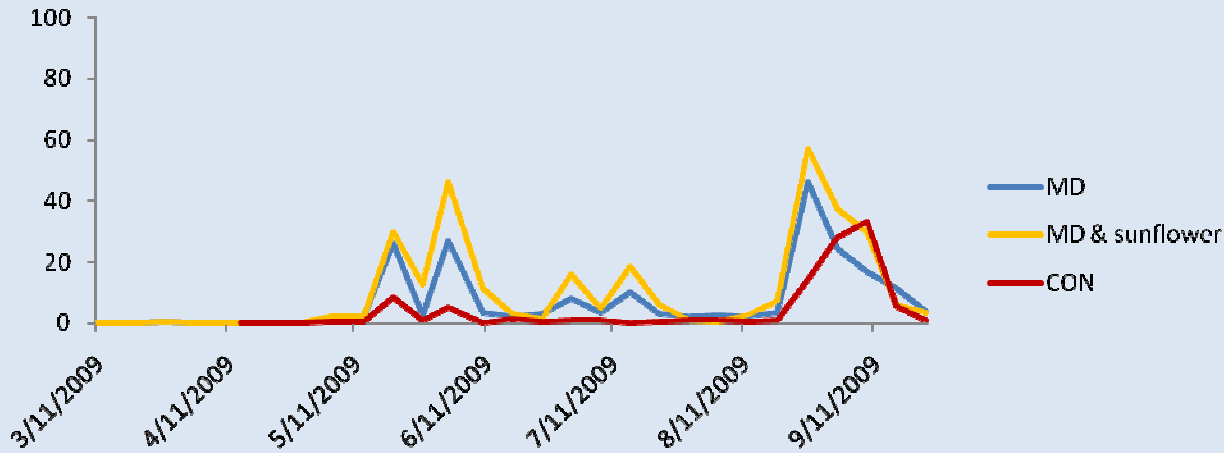


Conventional

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

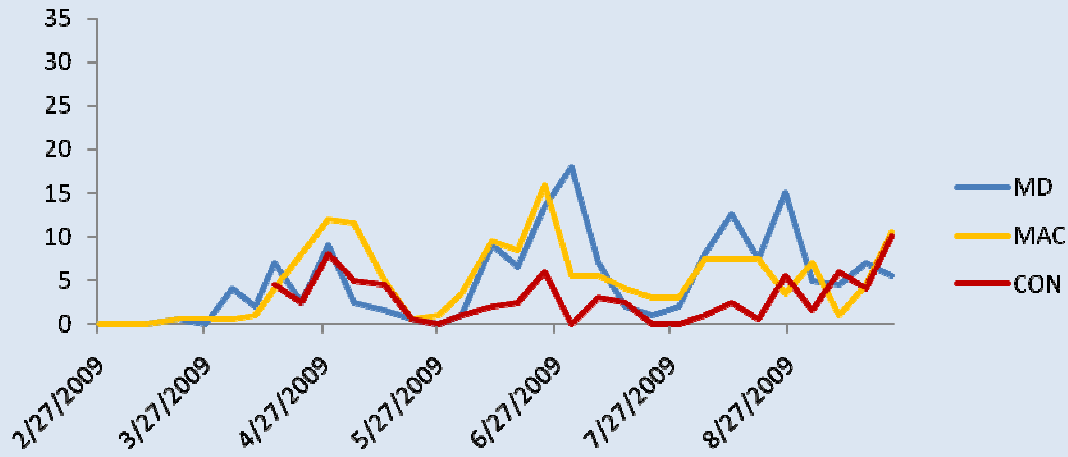
MD

Peach Twig Borer, Ceres



Isomate 2/27
 Dimilin 2/28
 Altacor 7/1

Ominivorous Leaf Roller, Ceres



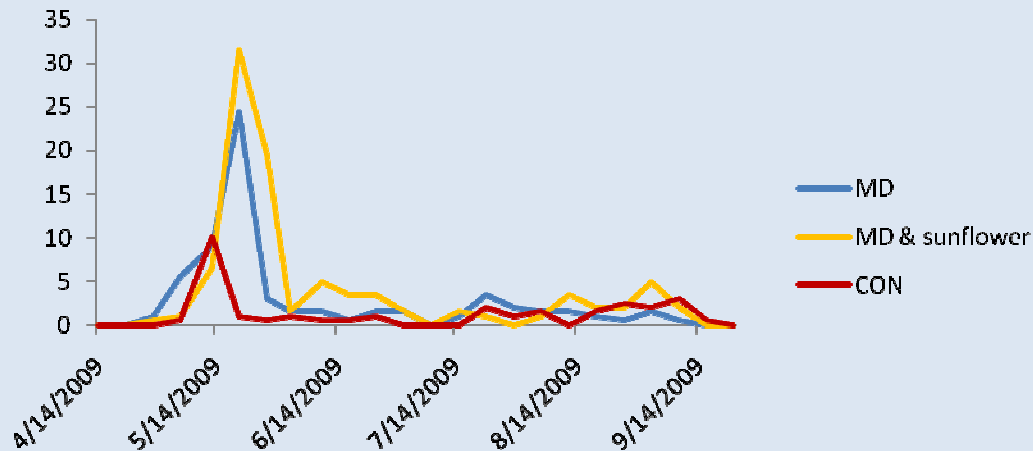
Conventional

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

MD

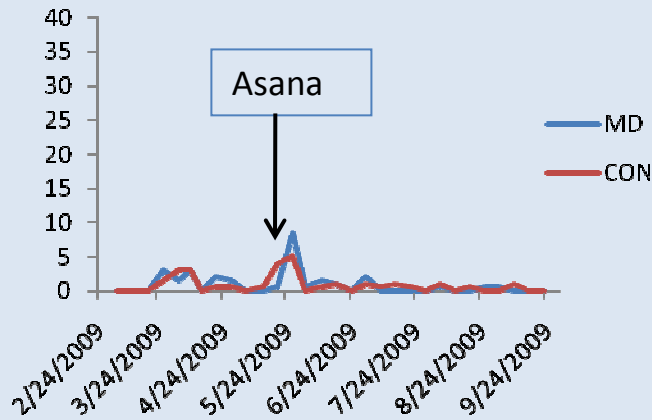
Isomate 2/27
Dimilin 2/28
Altacor 7/1

Oblique-Banded Leaf Roller, Ceres

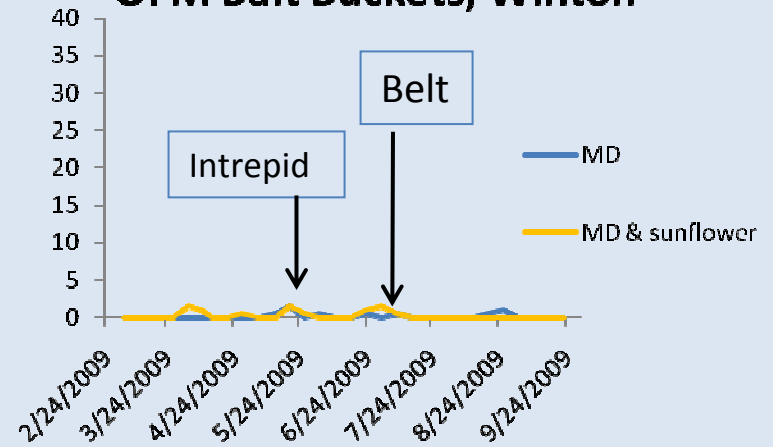


Oriental Fruit Moth (Bait Bucket Monitoring)

OFM Bait Buckets, Ballico-2

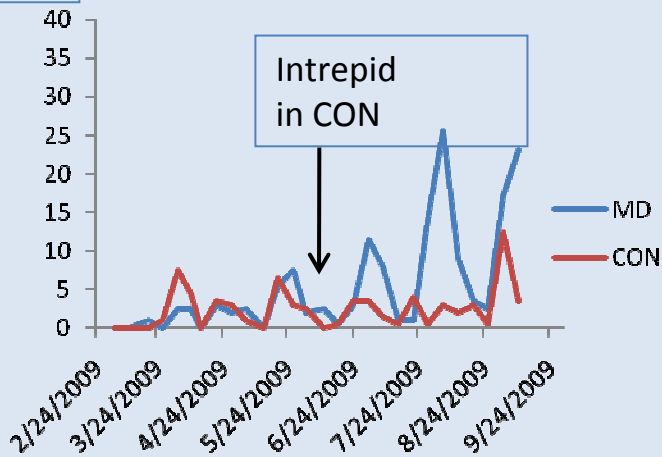


OFM Bait Buckets, Winton

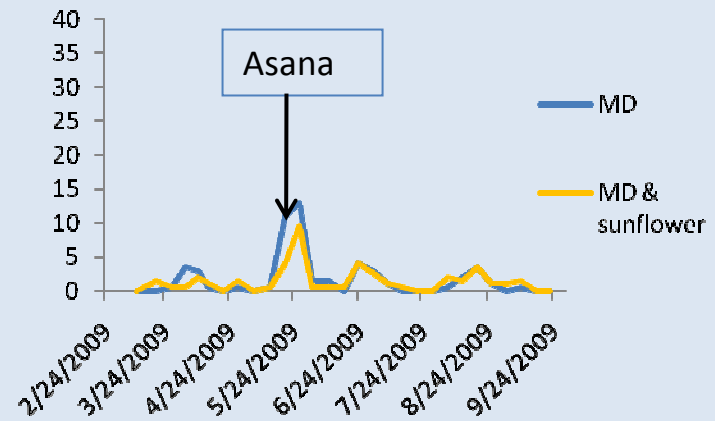


Dimilin
12/08

OFM Bait Buckets, Livingston

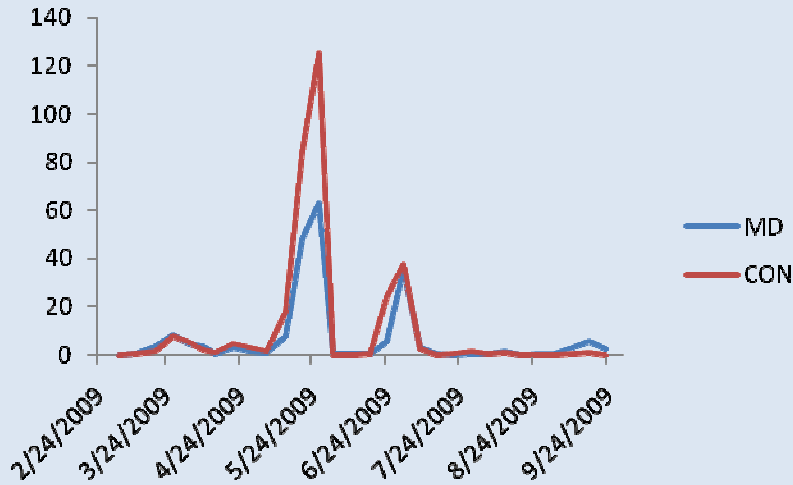


OFM Bait Buckets, Turlock

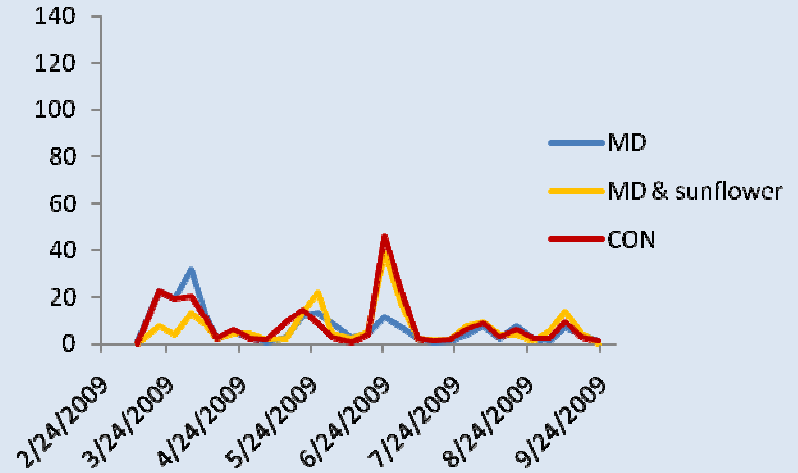


Bait buckets are less reliable for overwintering generation of oriental fruit moth in early spring

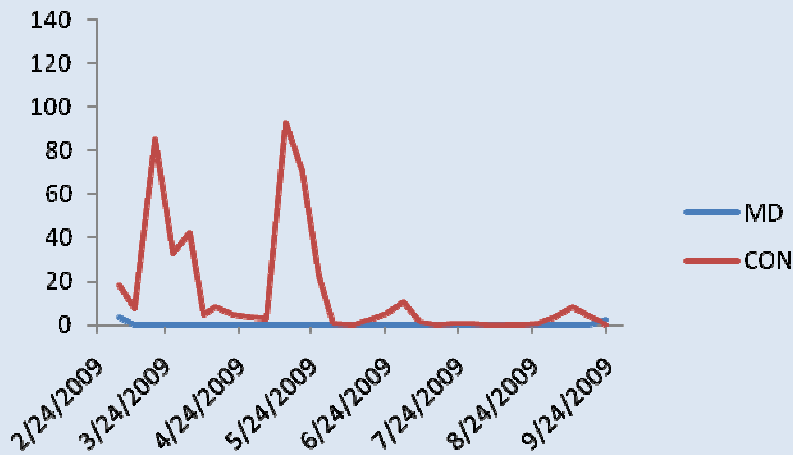
OFM Bait Buckets, Ballico-1



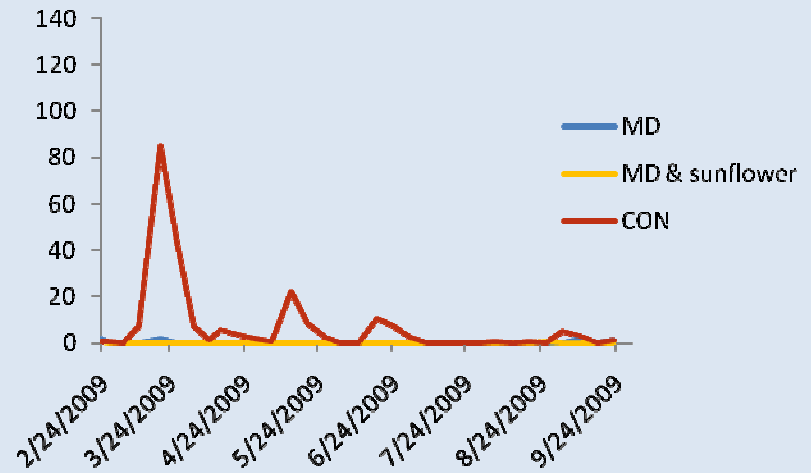
OFM Bait Buckets, Ceres



OFM Pheromone Traps, Ballico-1



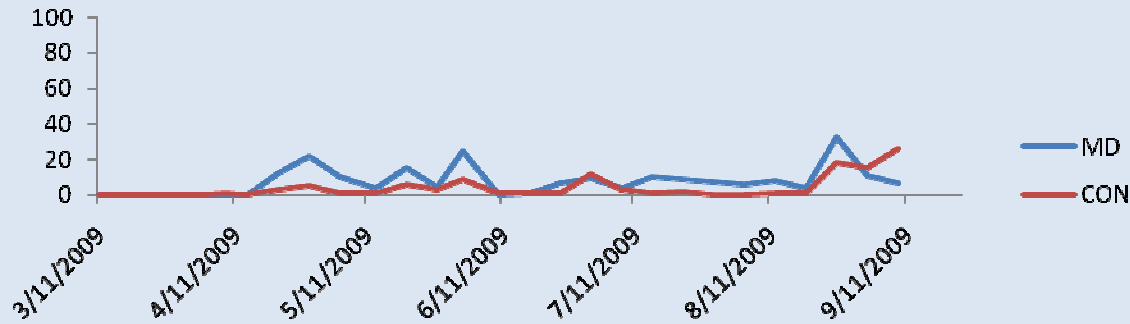
OFM Pheromone Traps, Ceres



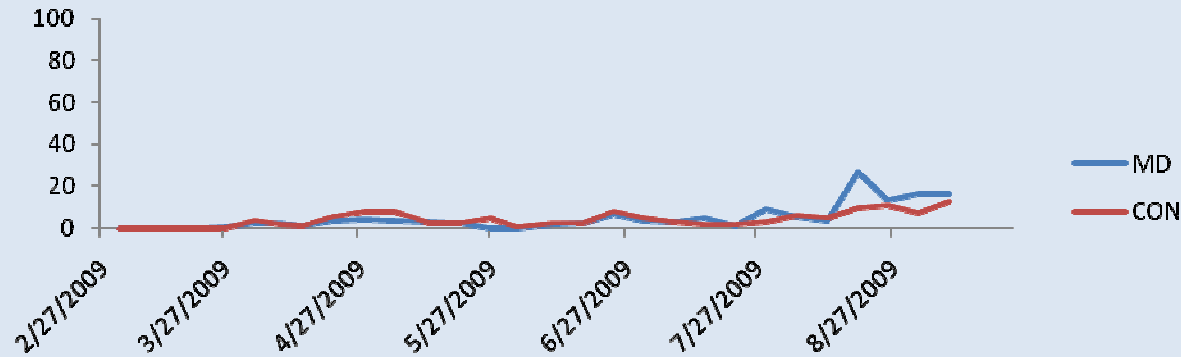
Dormant--
Dimilin

Intrepid
in CON
6/9

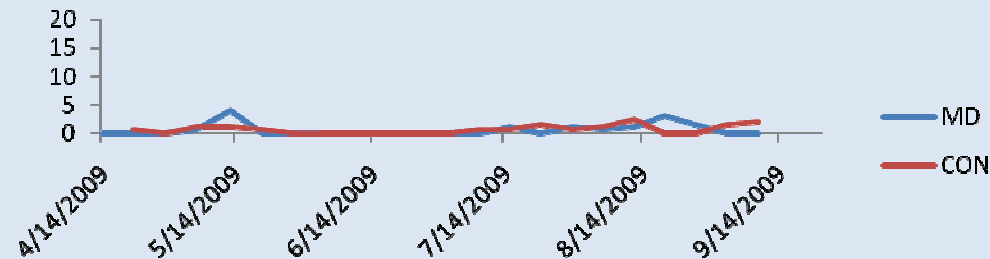
Peach Twig Borer, Livingston



Ominivorous Leaf Roller, Livingston



Oblique-Banded Leaf Roller, Livingston



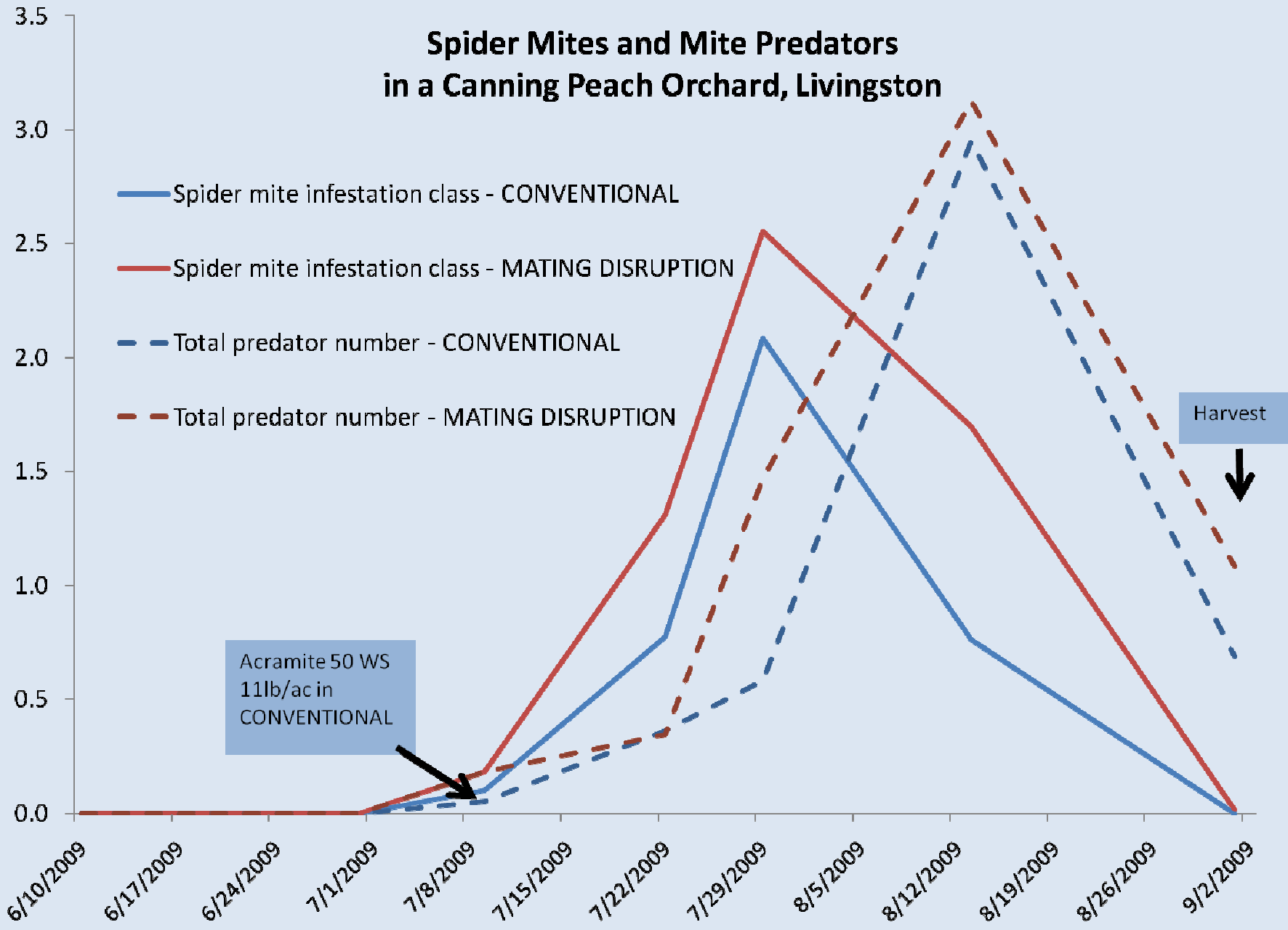
Web-spinning spider mites



Predators

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

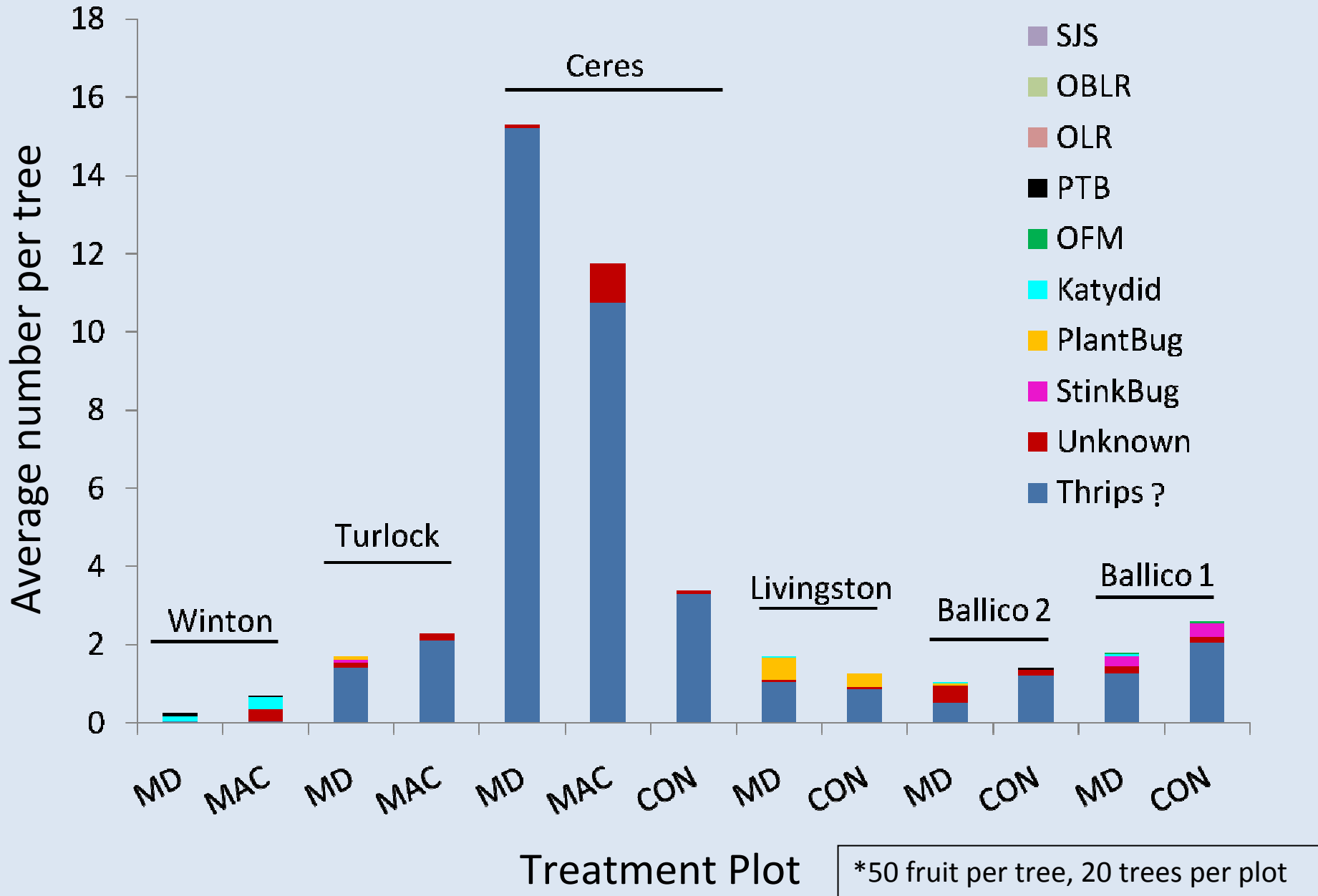
Spider Mites and Mite Predators in a Canning Peach Orchard, Livingston



Sunflowers and *Macrocentrus*

- Summer (May) sunflower planting
 - Four releases of *Macrocentrus* in orchards
 - Sunflower moth infested all plots of sunflower
 - *Macrocentrus* emerged in all plots
- Fall (September) sunflower planting
 - Ongoing

Average Fruit per Sample* Damaged by Various Insects (2009)



Fruit Damage

- Little or no detectable damage from OFM, PTB, OLR, or scale in any orchard
- Most damage might be due to thrips or OBLR (?), but this needs to be confirmed in 2010.



Thrips or OBLR Damage?





UC Statewide IPM Project
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Oblique-banded leaf roller

Ceres: Oblique-banded leaf roller?



Surprises Along the Way



Probably Fuller Rose
Beetle









