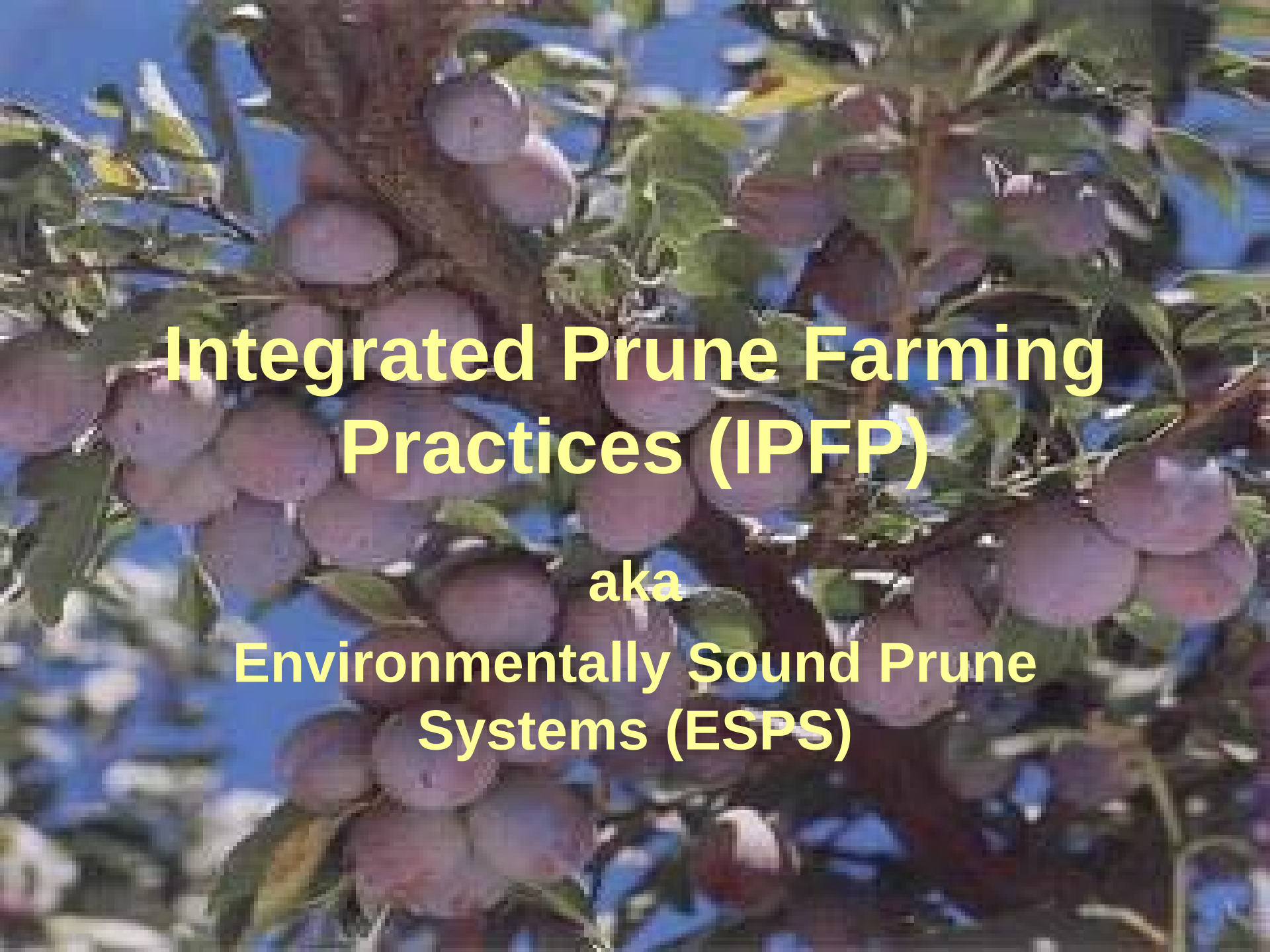

Integrated Prune Farming Practices (IPFP)
aka
Environmentally Sound Prune Systems (ESPS)

# The Team

- Henry Andris
- Rick Buchner
- Cyndi Gilles
- Brent Holtz
- Karen Klonsky
- Bill Krueger
- Themis Michailides
- Nick Mills
- Franz Neiderholzer
- Maxwell Norton
- Gary Obenauf
- Bill Olson
- Carolyn Pickel
- Wilbur Reil
- Ken Shackel
- Steve Sibbett
- Steve Southwick
- Fred Thomas
- Jed Walton
- Lisa Zane

# Overall Problem

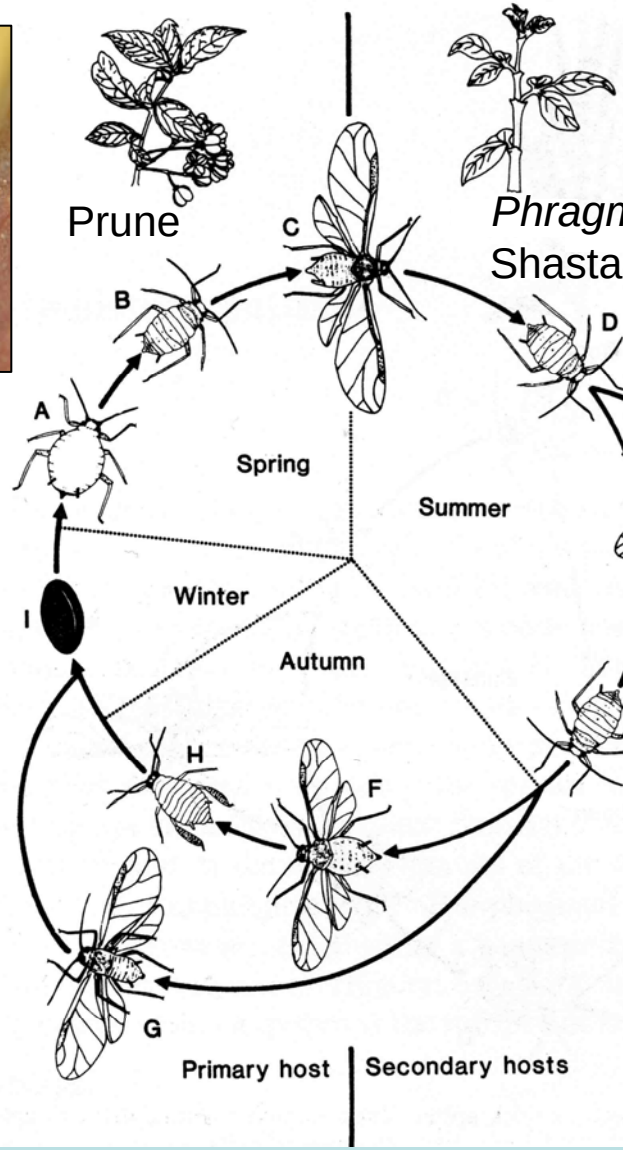
Tighter regulations, loss of pesticides, natural resource issues and economics are forcing the discovery of alternatives to traditional farming practices.

The alternative practice being evaluated is monitoring and applying treatments only as needed using “Reduced Risk” techniques.

“*If we can’t out gun ‘em, we will have to out smart ‘em.”*

| What has the IPFP Project Accomplished? | | | | |
|---|---|---|---|---|
| Monitoring Protocol | Created | Validated | Additional Validation Needed | Extended |
| Best Management Practices (BMP) | Y | Y | N | Y |
| Dormant Treatment Decision Guide | Y | Y | N | Y |
| Dormant Spur Evaluation | Y | Y | N | Y |
| SJS Traps | Y | Y | N | N |
| PTB | Y | Y | N | Y |
| OBLR | Y | Y | N | N |
| Mealy Plum Aphids | Y | Y | N | Y |
| Leaf Curl Plum Aphids | Y | Y | N | Y |
| Rust | Y | Y | N | Y |
| Presence/Absence mite sampling | Y | Y | N | Y |
| 10-min search for mites | Y | Y | N | Y |
| ONFIT | Y | N | Y | N |
| Irrigation Schedualing | Y | Y | N | Y |
| Leaf and Water analysis | Y | Y | N | Y |
| Early leaf analysis for K and N | Y | N | Y | N |
| Reduced Rates of Insecticides for Aphid control | Y | Y | N | Y |
| Zinc for Aphid Control | Y | Y | Y | Y |

# Aphid Life Cycle – Prune Aphids




F – gynopara
G – male
H – ovipara

# Yellow Water Traps Used to Monitor Fall Migration by Prune Aphids



Orchards monitored in Red Bluff, Corning (2), Chico, Sutter, Winters, Madera

Sorting through the vast numbers of aphids trapped to find prune aphids

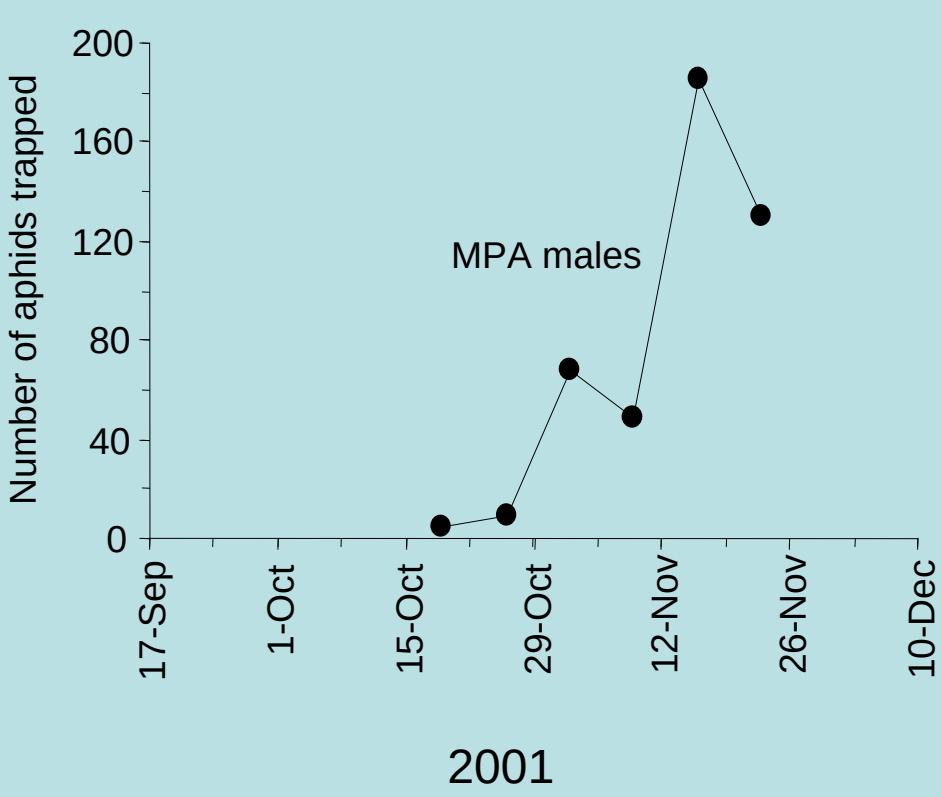
LCPA

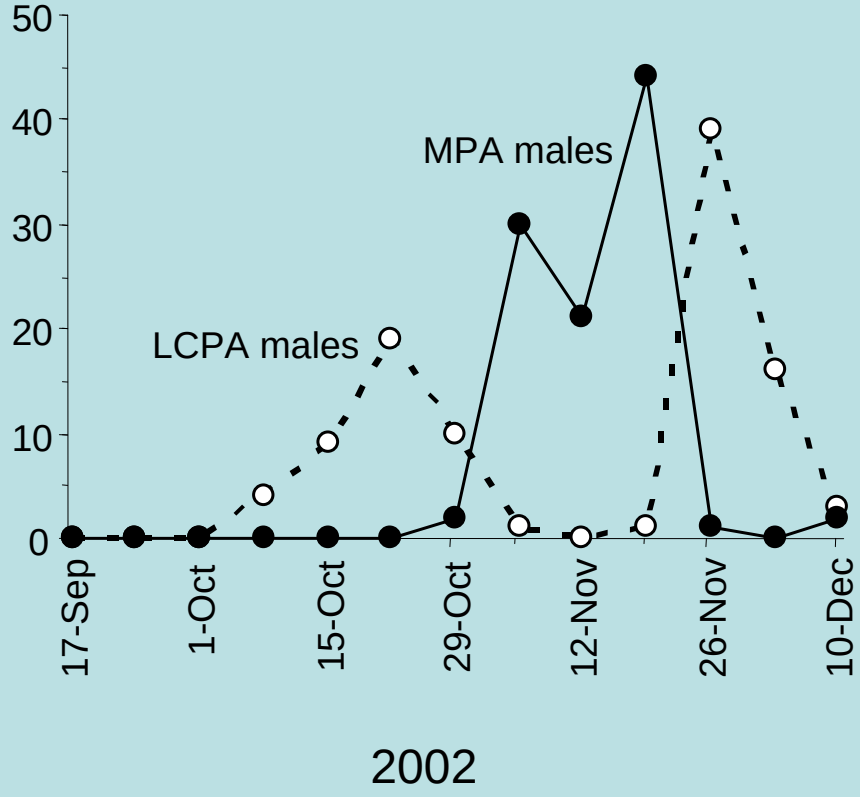
*Brachycaudus helichrysi*

MPA

*Hyalopterus pruni*

# Fall Migration by Prune Aphids
# Timing of Male Migration



# Biological Control of Mealy Plum Aphid
## *Aphidius transcaspicus*

# Dormant Spur for Monitoring Scale and Aphid Eggs

# Aphid Egg


UC Statewide IPM Project
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# San Jose Scale

Block Name: Date:

| spur | SPURS WITH | | | |
|---|---|---|---|---|
| # | LIVE SJS | PARASITIZED SJS | Live EFL | APHID EGGS |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| Total | | | | |
| Treatment | 4 or more | | 4 or more | 1 or more |
| threshold | | | | |
| | | | | |

If SJS level is less than 4 but more than 0 look at another 20 spurs. If at 4 or higher stop sampling and make treatment recommendation. If at 0 stop sampling. Make treatment recommendation for other pest if above treatmemt threshhold

## Delayed Dormant Treatment Decision Guide for Prune Orchards

| Aphid Orchard History Unknown Due to Past Dormant Sprays?[1] | Orchard History or Spur Sample Indicates Aphids? (No or Yes) | Scale Above Threshold | "Reduced Risk" Treatment Options | "Conventional" Treatment |
|---|---|---|---|---|
| **Yes** | | **No** | Low rates of insecticides without oil.<br>**OR**<br>2X oil* (once at green tip and 10 days later).<br>**OR**<br>In-season oil.*<br>**OR**<br>In-season insecticide | Insecticide + oil |
| **Yes** | | **Yes** | Low rates of insecticides + oil | Insecticide + oil |
| | **No** | **No** | Nothing | Insecticide + oil |
| | **No** | **Yes** | Oil (low pop[2])<br>**OR**<br>Insecticide + oil (high pop[2]) | Insecticide + oil |
| | **Yes** | **No** | Low rates of insecticides without oil.<br>**OR**<br>2X oil* (once at green tip and 10 days later).<br>**OR**<br>In-season oil.*<br>**OR**<br>In-season insecticide | Insecticide + oil |
| | **Yes** | **Yes** | Low rates of insecticides + oil | Insecticide + oil |

*** Oil alone is not effective for leaf curl plum aphid once the leaves are curled and will only suppress mealy plum aphid populations**

[1] To help determine the history of aphids in a dormant treated orchard:

1) Carefully observe trees throughout the orchard during growing season for the presence of any aphids. OR
2) Leave a few edge rows untreated and observe trees during the growing season for the presence of aphids.

[2] Low scale population is when 10 – 20 percent of the spurs have live scale.
High scale population is when more than 20 percent of the spurs have live scale.

**Problem:**

Possible Peach Twig Borer (PTB)

**Solutions:**

1. Every other year dormant spray
2. Bloom Bt. Sprays
3. Monitoring to decide treatment needs

# The Technique
(IPFP Guide page 17)

- If a Dormant/Bloom PTB – Monitoring not necessary
- Use PTB pheromone trap to identify Biofix
- Look at 15 fruit from 80 trees (1200) at 400 DD
- Dry market – Treat if over 2% larvae/damage
- Fresh market – Treat if any larvae/damage present

# Ten-minute Search for Web-Spinning Mites

(IPFP Guide page 21)

- Sample weekly from June 1st until July 15th
- Search known hot spots
- Two 5 minute searches per 40 acre block
- Rate mites and predators

# Web-spinning Mite Rating

1. **Light** – An occasional web-spinning mite on occasional leaf. Web-spinning mites generally hard to find. Example: less than one web-spinning mites per leaf.
2. **Light-moderate –** Web-spinning mites easier to find, but no colonies of web-spinning mites, no webbing and few eggs. Example: two to four web-spinning mites per leaf.
3. **Moderate** – Some leaves with no web-spinning mites others with small colonies of web-spinning mites with eggs easy to find, but very little, if any, webbing.
4. **Moderate-heavy** – Web-spinning mites on most leaves, colonies with eggs and webbing on some leaves
5. **Heavy** - Lots of web-spinning mites on most leaves. Colonies of web-spinning mites, eggs and webbing abundant.

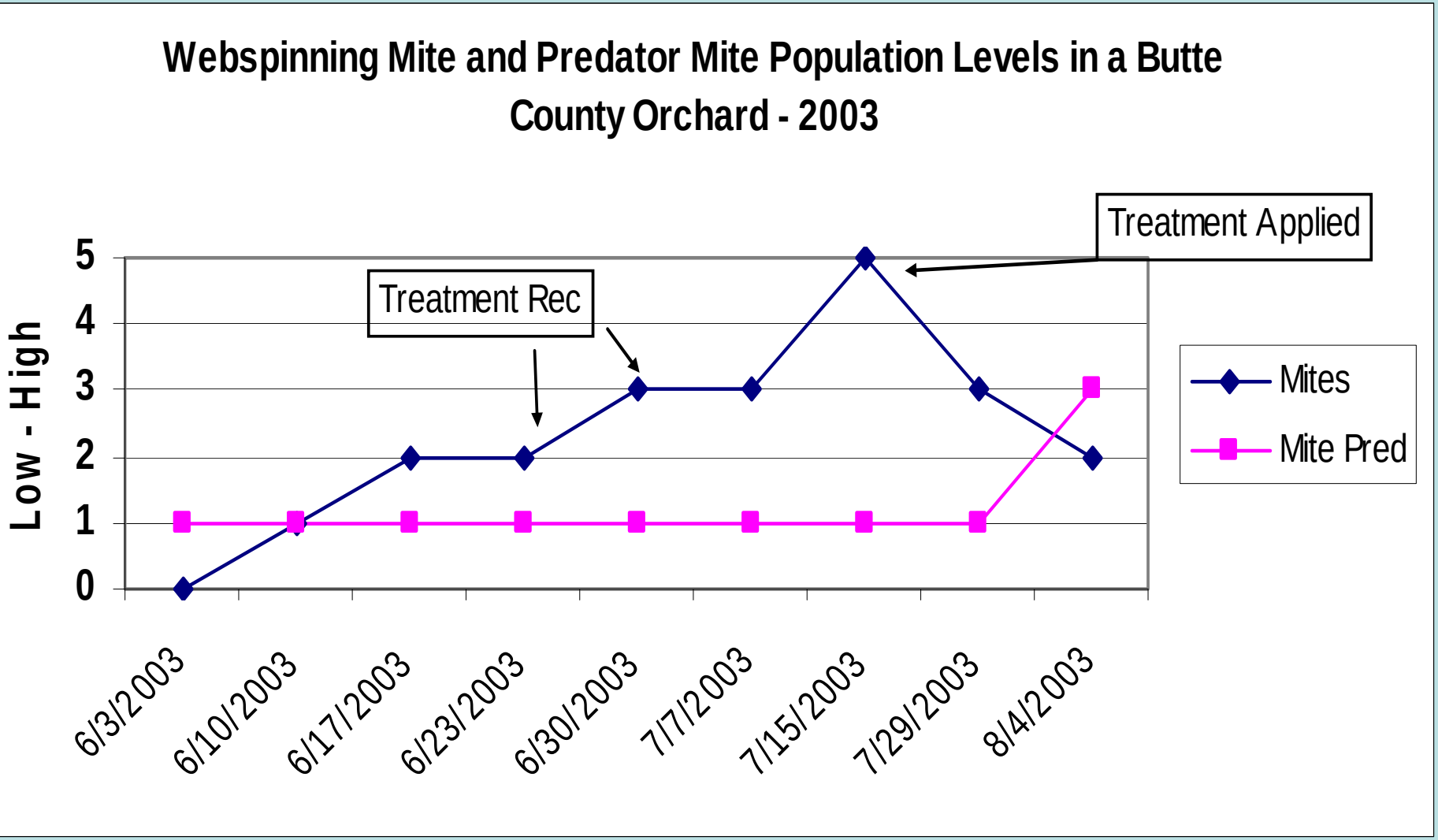
***Predator rating:***

1. **Low** – Hard to find. Example: less than one predator per six leaves.
3. **Moderate** – Easier to find. Example: one predator per three leaves.
5. **Heavy** – One or more predators per leaf.

# Treatment Threshold

Treat if:

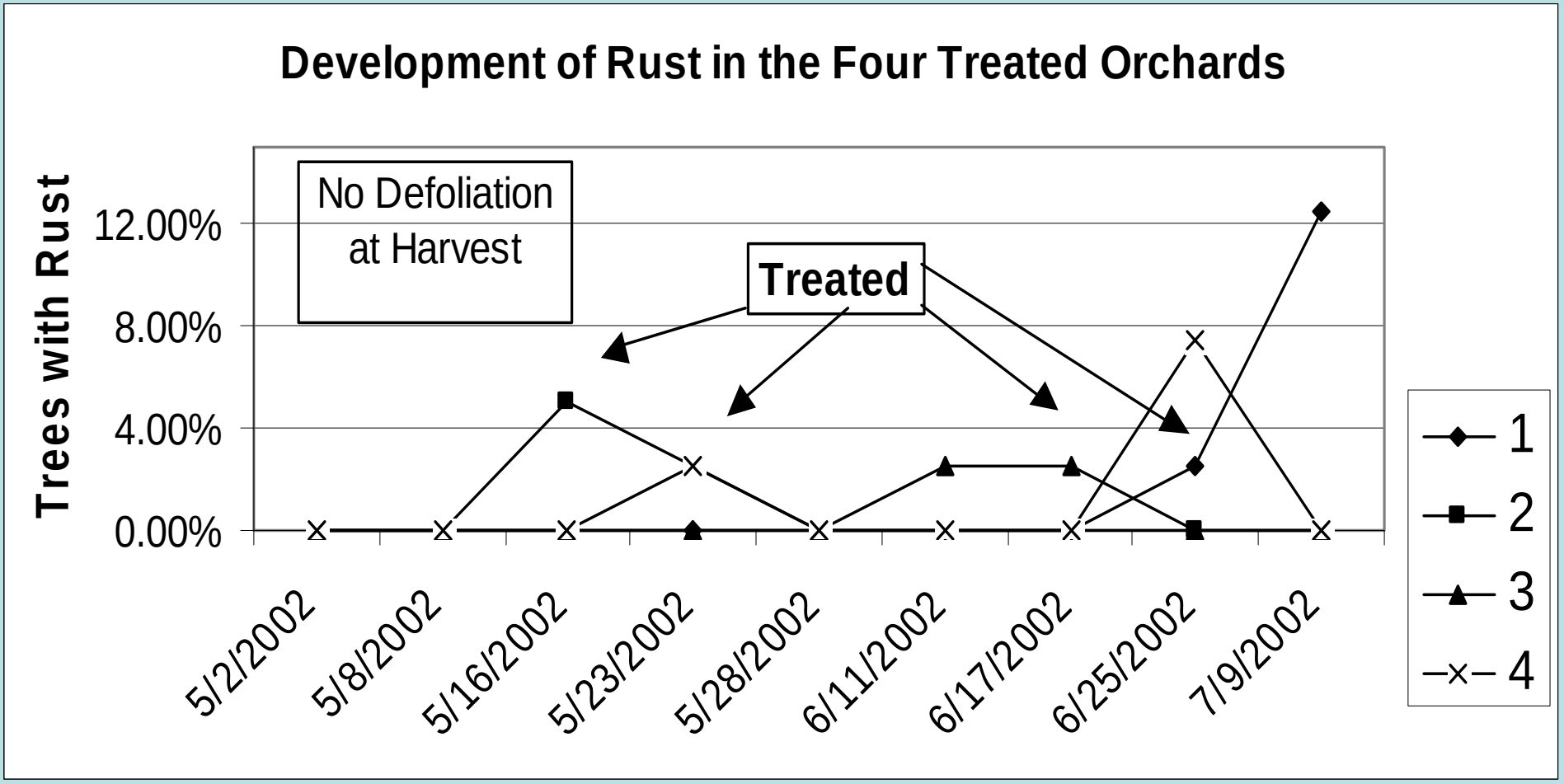
- Light/moderate web spinning mites / low predators
- Moderate web spinning mites / moderate to high predators


Webspinning Mite and Predator Mite Population Levels in a Butte County Orchard - 2003
Low - High
0
1
2
3
4
5
Treatment Rec
Treatment Applied
6/3/2003
6/10/2003
6/17/2003
6/23/2003
6/30/2003
7/7/2003
7/15/2003
7/29/2003
8/4/2003
Mites
Mite Pred

# Orchard Monitoring to Determine the Need for Prune Rust Treatments

(IPFP Guide page 24)

- Check leaves May 1st through July 15th
- Check known rust “hot spots”
- Select 40 random trees / 40 acres
- Confirm rust with sporulation
- Treat as soon as possible once infection is found (May 1 – July 15)


Development of Rust in the Four Treated Orchards
Trees with Rust
12.00%
8.00%
4.00%
0.00%
No Defoliation at Harvest
Treated
5/2/2002
5/8/2002
5/16/2002
5/23/2002
5/28/2002
6/11/2002
6/17/2002
6/25/2002
7/9/2002
1
2
3
4

# The Next Steps for the IPFP Project

- Continue to find “Reduced Risk” techniques for aphid control
- Present information developed in a BMP format
- Extend all information to PCA’s and clientele

UNIVERSITY of CALIFORNIA
Agriculture & Natural Resources
COOPERATIVE EXTENSION

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# Integrated Prune Farming Practices Decision Guide