



Integrated Prune Farming Practices (IPFP)

aka

**Environmentally Sound Prune
Systems (ESPS)**

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Overall Problem

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

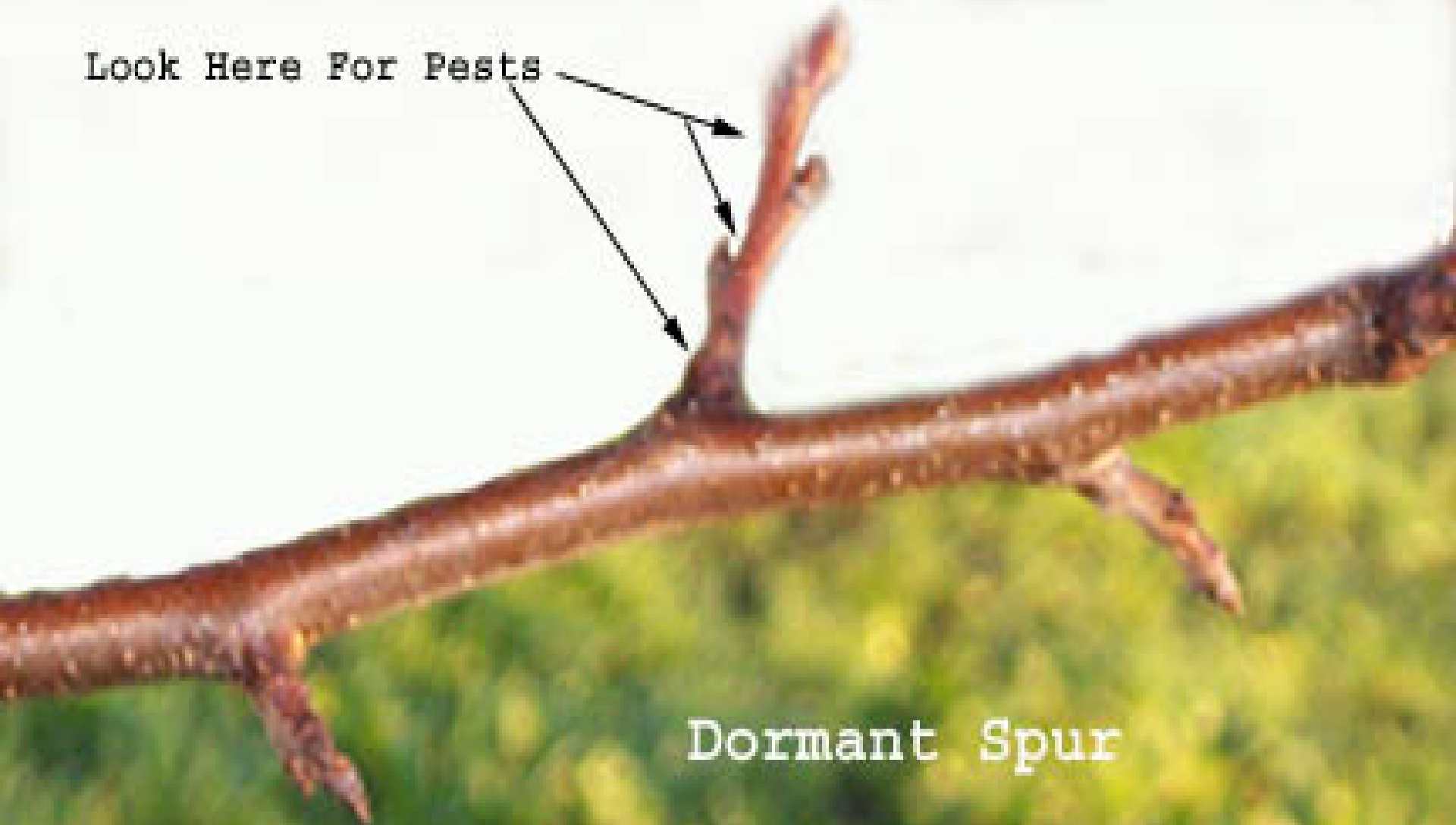
The alternative practice being evaluated is monitoring and applying treatments only as needed using “Reduced Risk” techniques.

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 Scheduling	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

Dormant Spur for Monitoring Scale and Aphid Eggs

Look Here For Pests



Dormant Spur

Aphid Egg



San Jose Scale

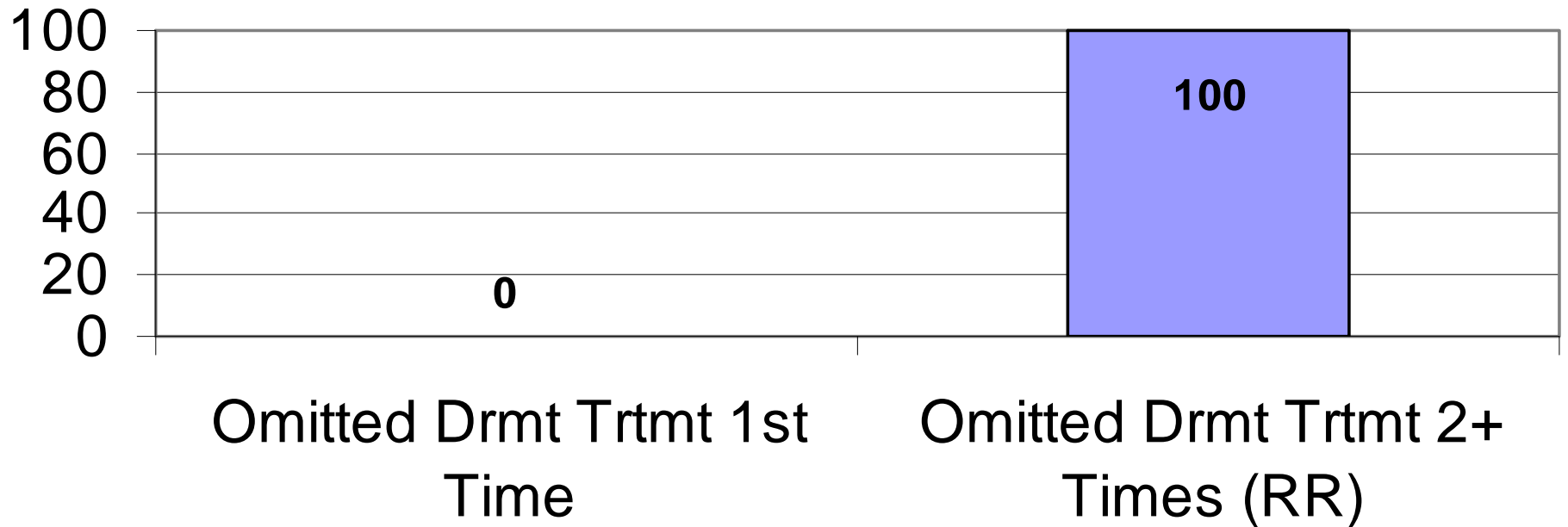


Block Name:**Date:**

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 threshold	4 or more		4 or more	1 or more

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 treatment threshold

% of Orchards Correctly Predicting an Aphid Outbreak



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. OR 2X oil* (once at green tip and 10 days later). OR In-season oil.* OR 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) OR Insecticide + oil (high pop ²)	Insecticide + oil
	Yes	No	Low rates of insecticides without oil. OR 2X oil* (once at green tip and 10 days later). OR In-season oil.* OR 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:

Without a dormant spray aphids
can be a problem

Incidence of Aphids Amongst Cooperators - 2003

	% of orchards with Few Aphids	% of orchards with Significant Aphids Above Threshold
No program for aphids	100	100
"Reduced Risk" program for aphids	85.7	14.3
Applied Traditional Dormant Spray	30.77	0

Problem:

Concern over Peach Twig Borer

Solutions:

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

Mean % Fruit with PTB Larvae and/or Damage Present - 2003

Treatment	400 Degree-Days	July	Harvest
Reduced Risk	.02 a	.17 a	.06 a
Conventional	0 a	.01 a	.02 a

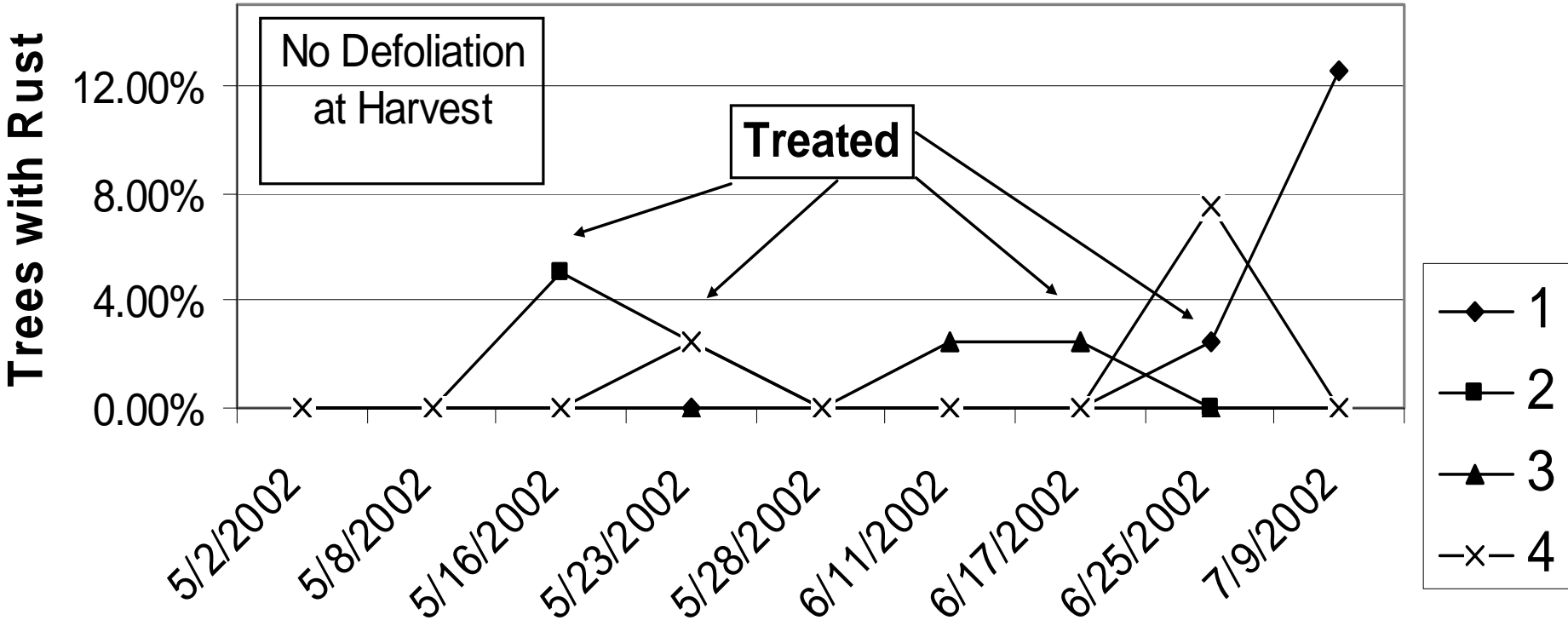
Problem:

No way of knowing if Prune Rust will be a problem. Consequently, rust treatments are the most common growing season treatment

Solution:

Create a rust monitoring technique

Development of Rust in the Four Treated Orchards



Problem:

Growers Do Not know When or If
They Need to Treat For Mites.

Solution:

10-Min Search for
Webspinning Mites

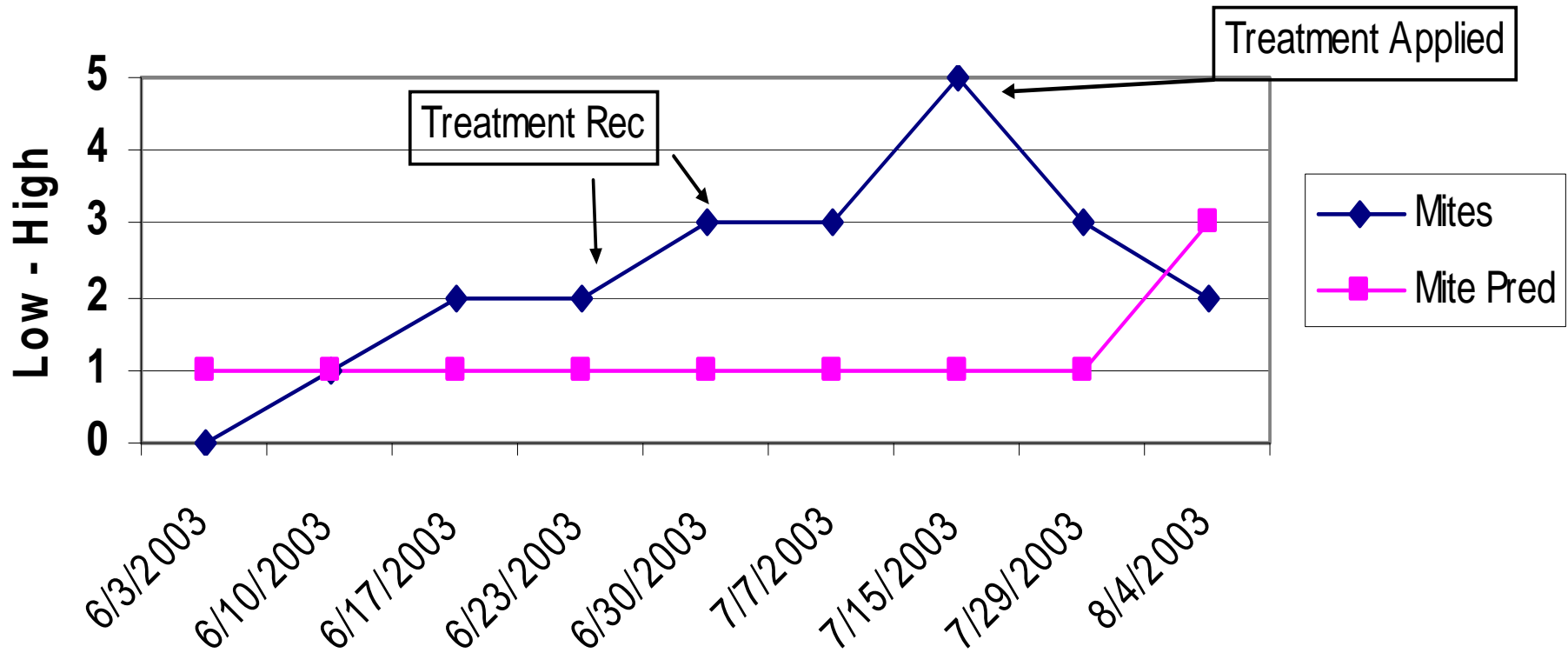
Web-spinning mite rating

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.

Web-spinning Mite and Predator Mite Population Levels in a Butte County Orchard - 2003



Problem:

Results from July tissue analysis may be too late to make mid-season potassium (K) corrections.

Possible Solution:

Evaluate a May tissue analysis for K

Usefulness of May K Tissue Analysis

- Above 2.3% K = generally no visual symptoms of K deficiency
- 1.6% to 2.3% K = indeterminate
- Below 1.6% K = visual K deficiency symptoms likely

Problem:

Concern that alternative practices may lead to reduced fruit quality

Solution:

Demonstrate that fruit quality can be equaled

Mean 2003 Harvest and Quality Data

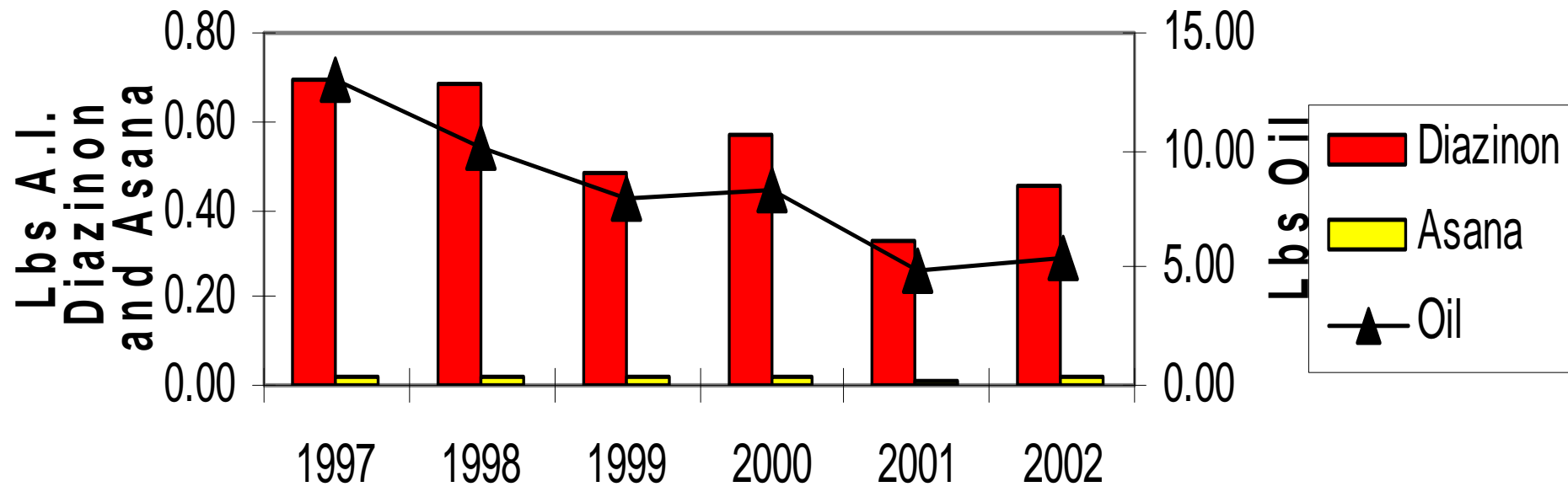
	Soluble Solids	Dry Count/Lb	Dry Away Ratio	Pressure (PSI)	% of Fruit with Brown Rot	% of Fruit with Worm Damage	% of Fruit with SJS Damage	% of Fruit with Cracks
Conventional	22.17	68.41	3.14	3.92	0.24	0.09	0	1.93
Reduced Risk	21.69	65.66	2.99	3.64	0.69	0.20	0	1.66

Pesticide Use

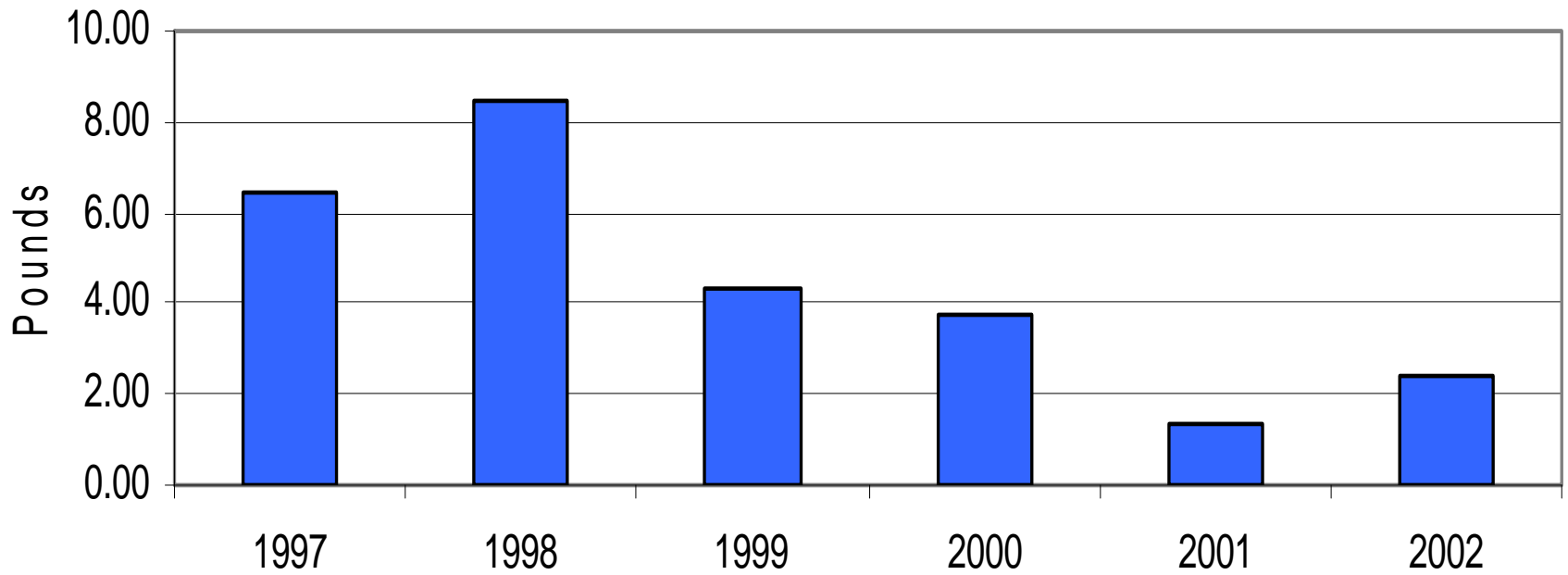
Pounds A.I. of Pesticides Applied in Prunes

Total Pounds of a.i.applied						
	1997	1998	1999	2000	2001	2002
DIAZINON	57,335	57,139	40,068	48,877	28,587	38,585
ESFENVALERATE (Asana)	1,525	1,474	1,235	1,685	1,212	1,268
OIL	1,074,785	837,120	654,158	714,634	413,779	464,562
SULFUR	534,039	700,360	355,420	323,653	111,945	205,670

Lbs A.I. of Asana, Diazinon and Oil Applied per Bearing Acre of Prunes



Lbs A.I. of Sulfur Applied per Bearing Acre of Prunes



Why Bother Monitoring?

**Why Not Just Continue With
The Traditional Dormant Spray,
Mite Spray, Rust Spray etc.?**

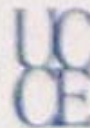
Reason to Monitor:

- 1) “Ag Waiver” and Documentation That You Are Using B.M.Ps.**
- 2) TMDLs**
- 3) Economics**
- 4) Loss of Pesticides**
- 5) Tighter Regulations**

Integrated Prune Farming Practices Decision Guide



UNIVERSITY OF CALIFORNIA
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Reader # _____

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

