

REDUCING PESTICIDE IMPACT IN THE VINEYARD

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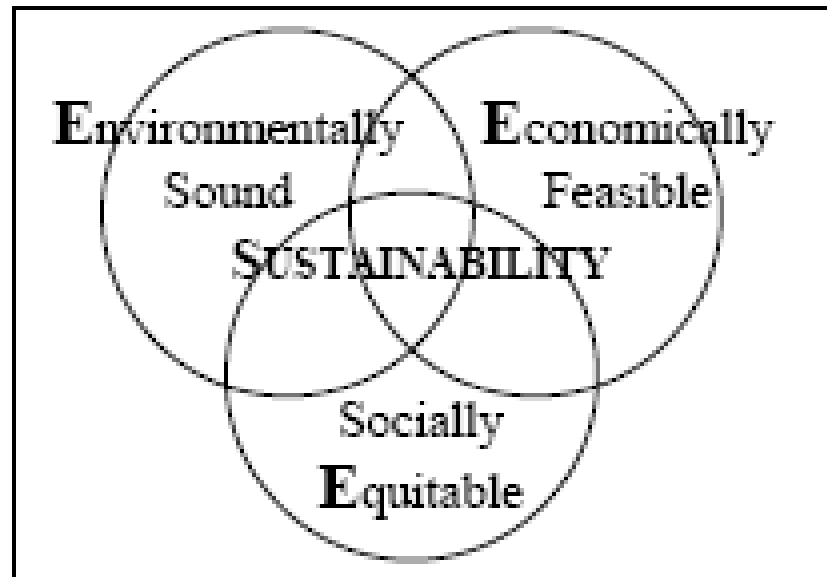
- LODI
- DELTA
- STANISLAUS
COUNTY



GREEN VITICULTURE

- ORGANIC
- BIODYNAMIC
- SUSTAINABLE

SUSTAINABLE DECISION MAKING



The Lodi Rules for Sustainable Winegrowing

- LWC has always been about marketing; The Lodi Rules will help brand Lodi
- May add value to Lodi grapes and wine
- Logical outgrowth of LWC's Sustainable Viticulture program

SUSTAINABLE DECISION MAKING

The Lodi Rules Farming Standards

To be Included a Practice must be:

1. Measurable (verifiable)
2. Enhance sustainability (one or more of the 3 E's of sustainability)
3. Technically & economically achievable verifiable)

Unique Features of the Lodi Rules Program?

- Use of pesticide impact model
- Science-based farming standards
- Focus is on quality
- Emphasis on measurement and record keeping (if you can't measure it you can't manage it)
- Certifies all aspects of winegrape growing
- Improvement over time is part of model

Pesticide Environmental Assessment System or PEAS

- Model Developed by Dr. Chuck Benbrook
- Calculates environmental impact units for each pesticide Active Ingredient used in Lodi
- EIU's are a direct measure of environmental impact
- EIU's can be added up to calculate total impact of all pesticides used on each vineyard acre per year (50 IMPACT UNITS PER SEASON)

PEAS is a Multi-attribute Model

PEAS EIU is made of the following indices:

- Worker exposure
- Acute toxicity to birds
- Acute Toxicity to Daphnia (measure of water quality)
- Acute toxicity to Bees
- Dietary risk e.g. residue ingestion

Data to calculate indices were from EPA, USDA
and University Studies

Pesticide	Index
Lorsban	173.00
Nexter	50.00
Copper Hydroxide	7.00
Neem Oil	5.00
Provado	3.00
Cryolite	2.94
Sulfur Dust	2.37
Omite	2.05
Surround	1.45
Roundup	0.39
Kaligreen	0.39
Rally	0.32

SAMPLE PEAS FOR SEASON

Spray Date	Pesticide	Rate per acre	Pesticide Units	Impact Index/Unit	Impact Units per Application
4/13/04	Sulfur Dust	15	Lbs	0.154	2.31
4/22/04	Sulfur Dust	15	Lbs	0.154	2.31
5/3/04	Sulfur Dust	15	Lbs	0.154	2.31
5/13/04	RoundUp Ultra Dry*	0.92	Lbs	0.234	0.07
5/16/04	Sulfur dust	14	Lbs	0.154	2.15
5/29/04	Sulfur dust	15	Lbs	0.154	2.31
6/2/04	Rally 40W	3.88	Ozs	0.078	0.30
6/24/04	Provado Solupak 75%	0.63	Ozs	5.465	3.44
6/24/04	Acramite	0.87	Lbs	0.818	0.71
6/24/04	Pristine	11.49	Ozs	0.017	0.19
7/28/04	Gramoxone Max*	1	Pints	0.166	0.05
7/31/04	RoundUp Ultra Dry*	0.63	Lbs	0.234	0.05
Total Pesticide Impact Units for 2004					16.20

HERBICIDES

Pesticide Name	PEAS as Applied
Visor 2E	3.04
Gramoxone Inteon	2.20
Karmex DF	2.16
Buccaneer	1.76
Prowl 3.3 EC	1.68
RoundUp Weathermax	1.68
Solicam DF	0.78
Goal 2XL	0.64
Shark EW	0.60
Princep Caliber 90	0.60
Touchdown Herbicide	0.48
Surflan AS	0.48
Roundup Original	0.24
Goaltender	0.16
Chateau Herbicide SW	0.12
Poast	0.10
Matrix FNV	0.04

MITICIDES

Pesticide Name	PEAS as Applied
Kelthane 50WSP	104.10
Nexter	50.28
Acramite 50 WS	13.12
Fujimite 5EC	6.16
Vendex WP	1.96
Neemix 4.5	1.44
Omite 30W	1.13
Zeal	0.99
Envidor 2 SC	0.64
Onager Miticide	0.40
Agri-Mek	0.21
M-Pede	0.09
JMS Stylet Oil	0.04

FUNGICIDES

Pesticide Name	PEAS as Applied
Kocide 2000	7.53
Champ Formula 2 Flowable	7.42
Rovral 4 Flowable	7.08
Copper Sulphur Dust	2.70
Sulfur dust	2.25
Botran 75WP	1.44
Sulfur DF	1.30
Captan 80 WDG	0.85
Kaligreen	0.50
Elevate 50 WDG	0.48
Elite 45 WP	0.36
Rally 40W	0.32
Flint	0.20
Scala SC	0.18
Procure 480SC	0.12
Quintec	0.12
JMS Stylet Oil	0.04
Sovran	0.04
Serenade	0.03

INSECTICIDES

Pesticide Name	PEAS as Applied
Lorsban 4E	177.88
Imidan 70W	167.91
Lannate SP	29.84
Danitol 2.4 EC	25.2
Sevin Brand 80S Carbaryl	17.62
Venom Insecticide	8.42
Baythroid XL	6.96
Pyrenone Crop Spray	3.38
Provado 1.6F	2.34
Intrepid 2F	2.28
Dipel	1.51
Pyganic Crop Protection EC 5.0	1.39
Admire 2F	0.48
Assail WSP	0.28
Movento	0.18
Applaud DF	0.12
Neemix 4.5	0.08

“Just because someone is
selling it, doesn’t mean
it’s right for you”



Wilbur Ellis California Business Unit

2007 Grape Pacific Miticide Trial - CA Viticultural Group

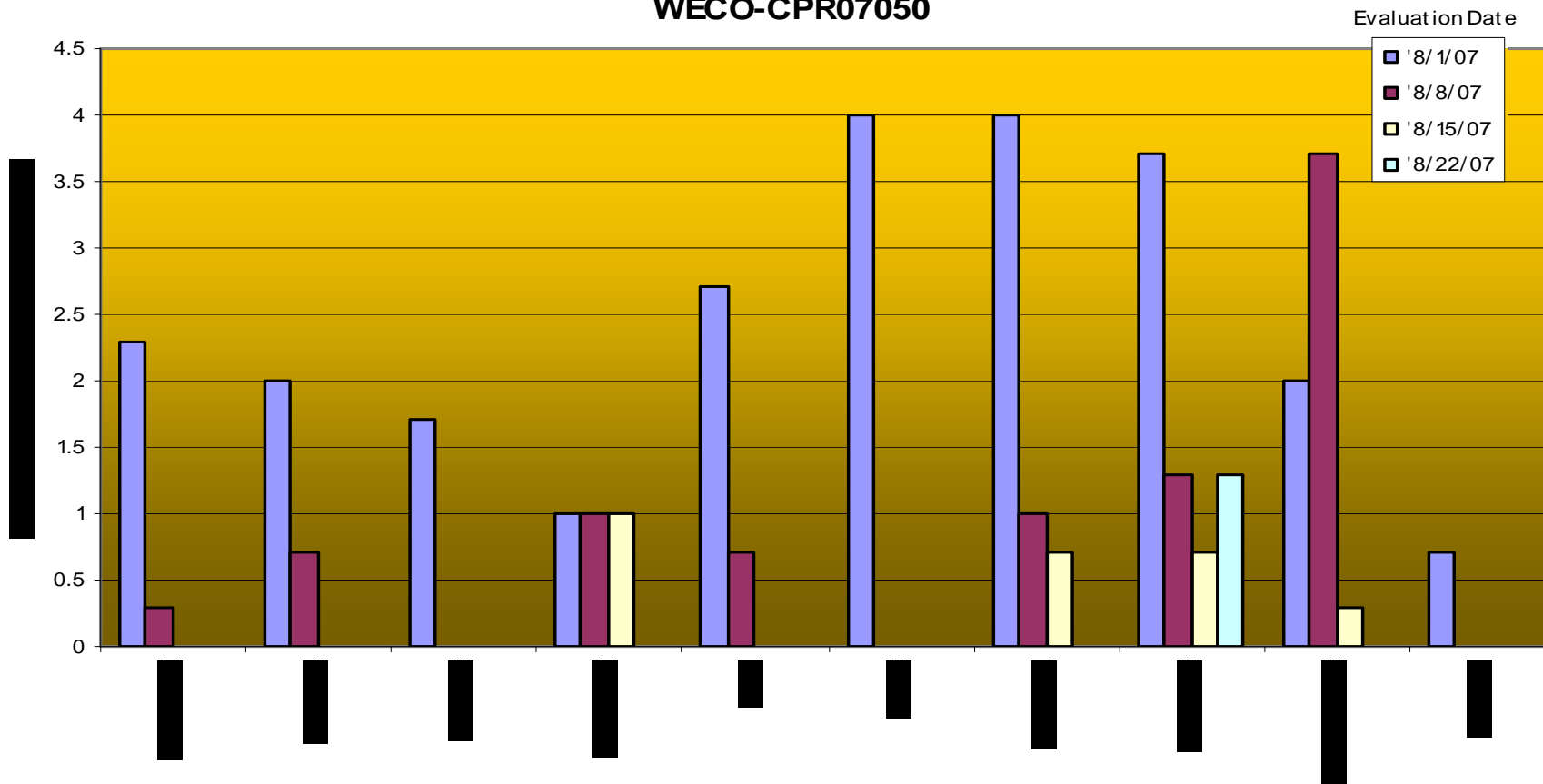
Sparrowk, Lodi, California

Crop Production Research Test # CPR07050

Trt #	Company	Product	Rate	Surfactant	Rate
1	Chemtura	Acramite	1 lb	Syltac	0.125%
2	Bayer	Envidor	18 oz	R-11	0.0625%
3	Gowan	Onager	19.2 oz	R-11	0.0625%
4	Syngenta	Agri-mek	10 oz	R-11	0.0625%
5	Valent	Zeal	2.4 oz	R-11	0.0625%
6	Chemtura	Omite	8 lb	Sylgard 309	0.0156%
7	Ecosmart	EcoTrol	6.0 pt	Natural Wet	0.125%
8	Gowan	GWN-1715	10.67 oz	R-11	0.0625%
9	Org. Labs	Organocide	2 oz/gal	None	
10	Mana	Apollo	8 oz	Syltac 0.125	0.125%

Grape Miticides for the Control of Pacific Mites - Lodi August 2007

WECO-CPR07050



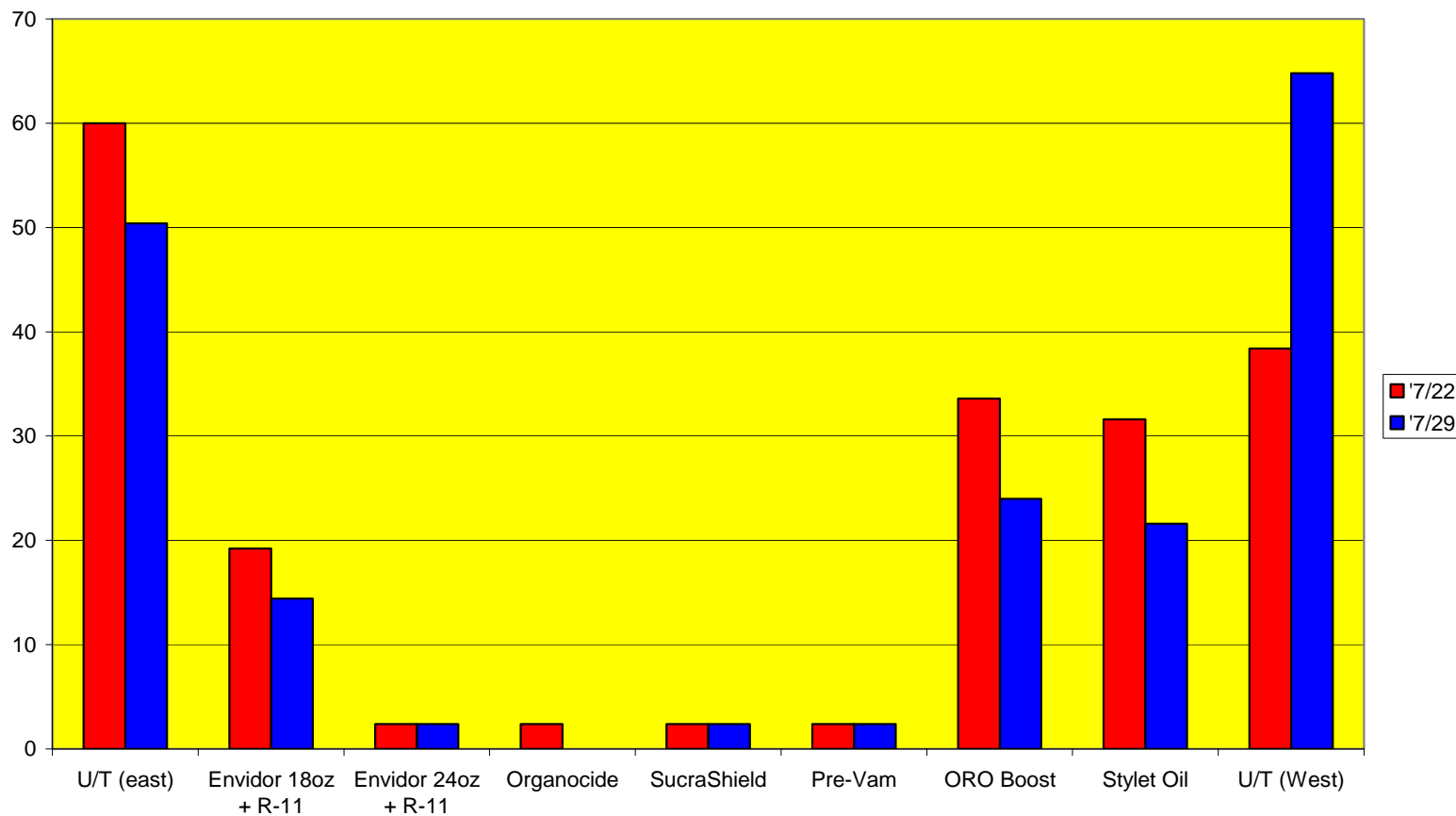
2008 Grape Miticide Performance

LODI

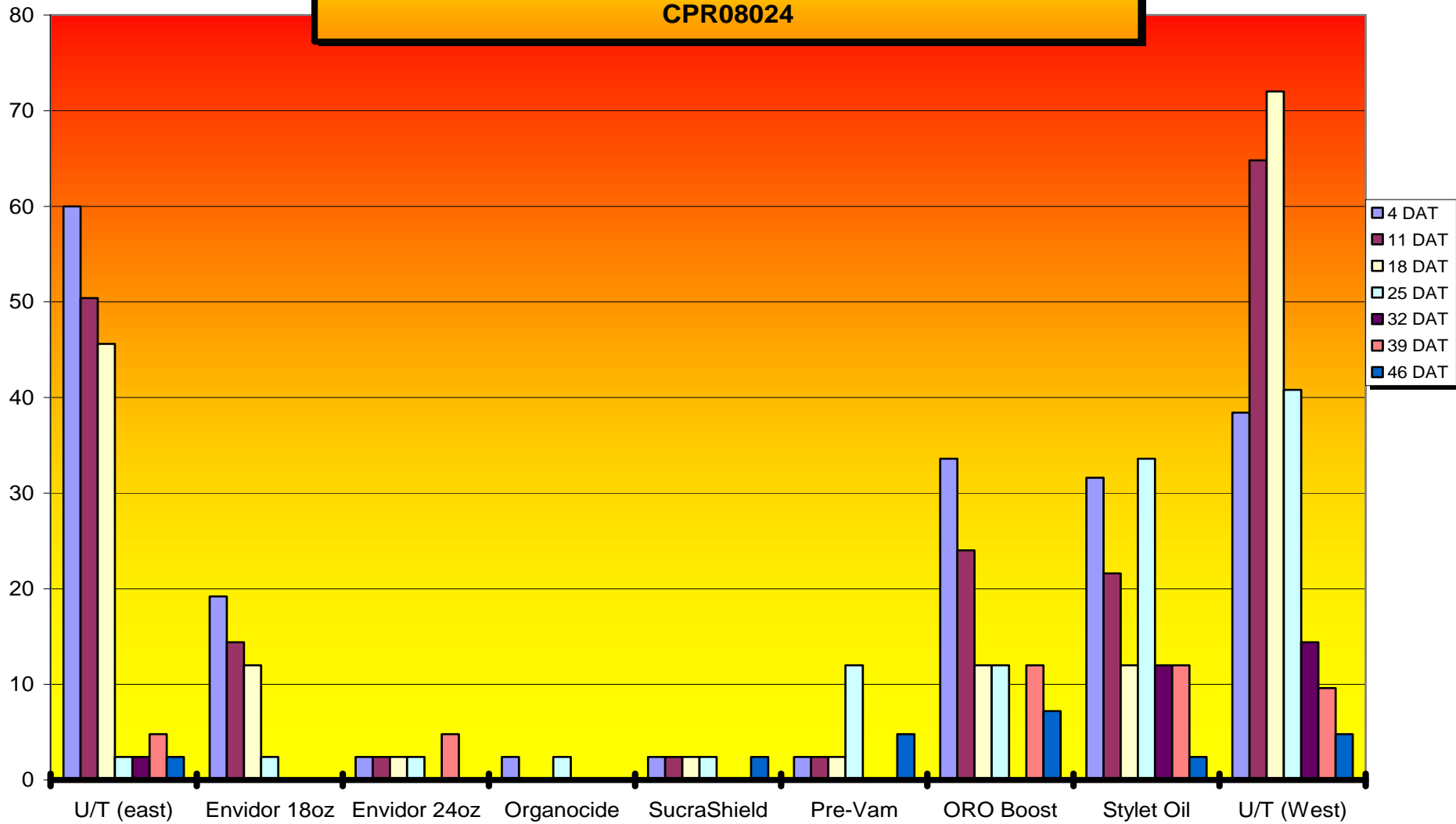
Materials Applied (GPA = 100):

- 1) Envidor @ 18 oz/A + R-11 @ 0.25% V/V
- 2) Envidor @ 24 oz/A + R-11 @ 0.25% V/V
- 3) Organocide @ 2 oz/gal (OMRI)
- 4) SucraShield @ 1% V/V (OMRI Pending)
- 5) Pre-Vam (VINTRE) @ .25% V/V
- 6) ORO Boost @ 0.4% V/V (OMRI)
- 7) Stylet Oil @ 2% V/V (OMRI)

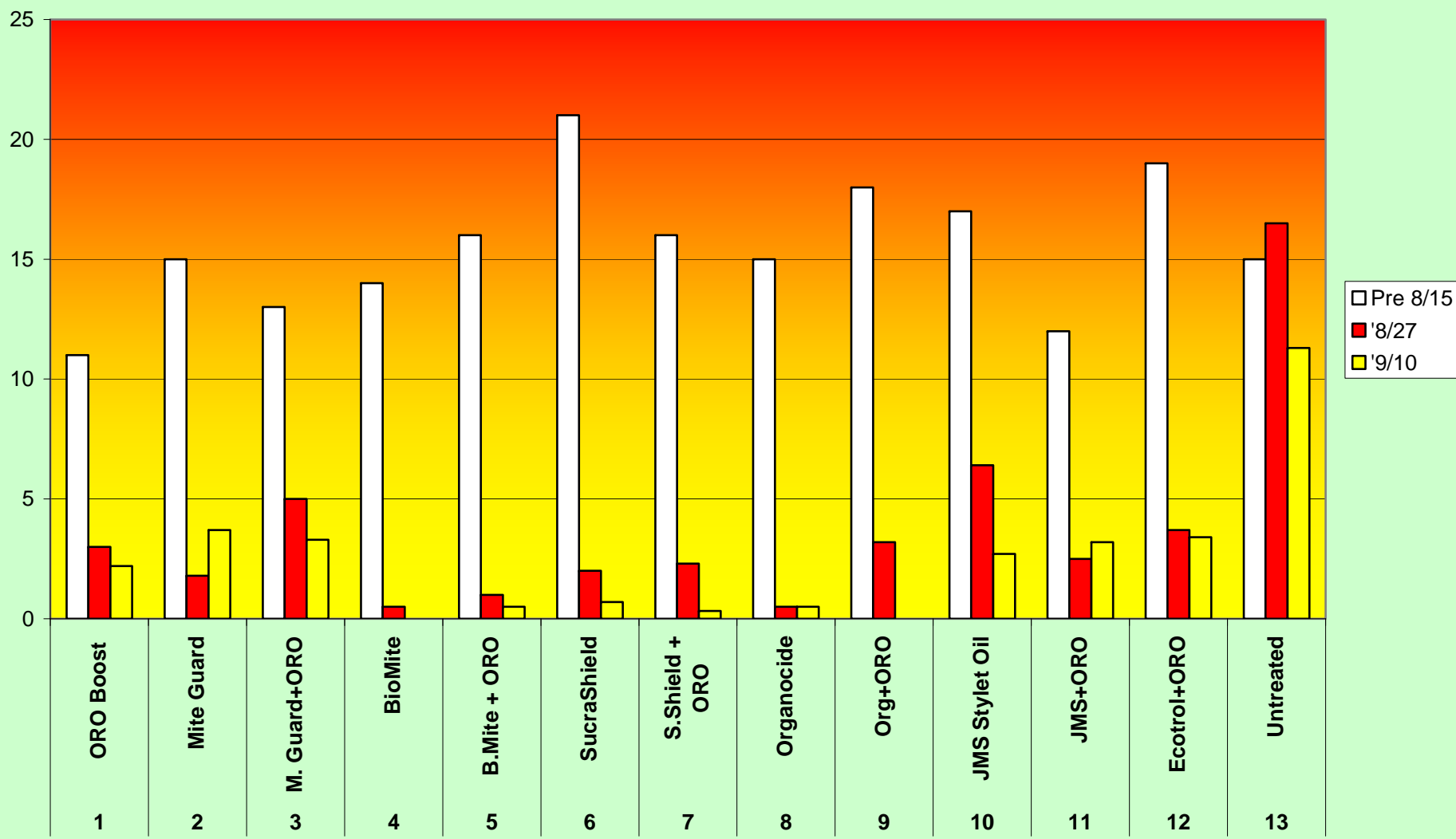
2008 Grape Miticide Study - Quashnick/Boskisch
Pacific Mite Control - ADULTS / LEAF - 4 versus 11 DAT
Wilbur-Ellis Crop Production Research
CPR08024



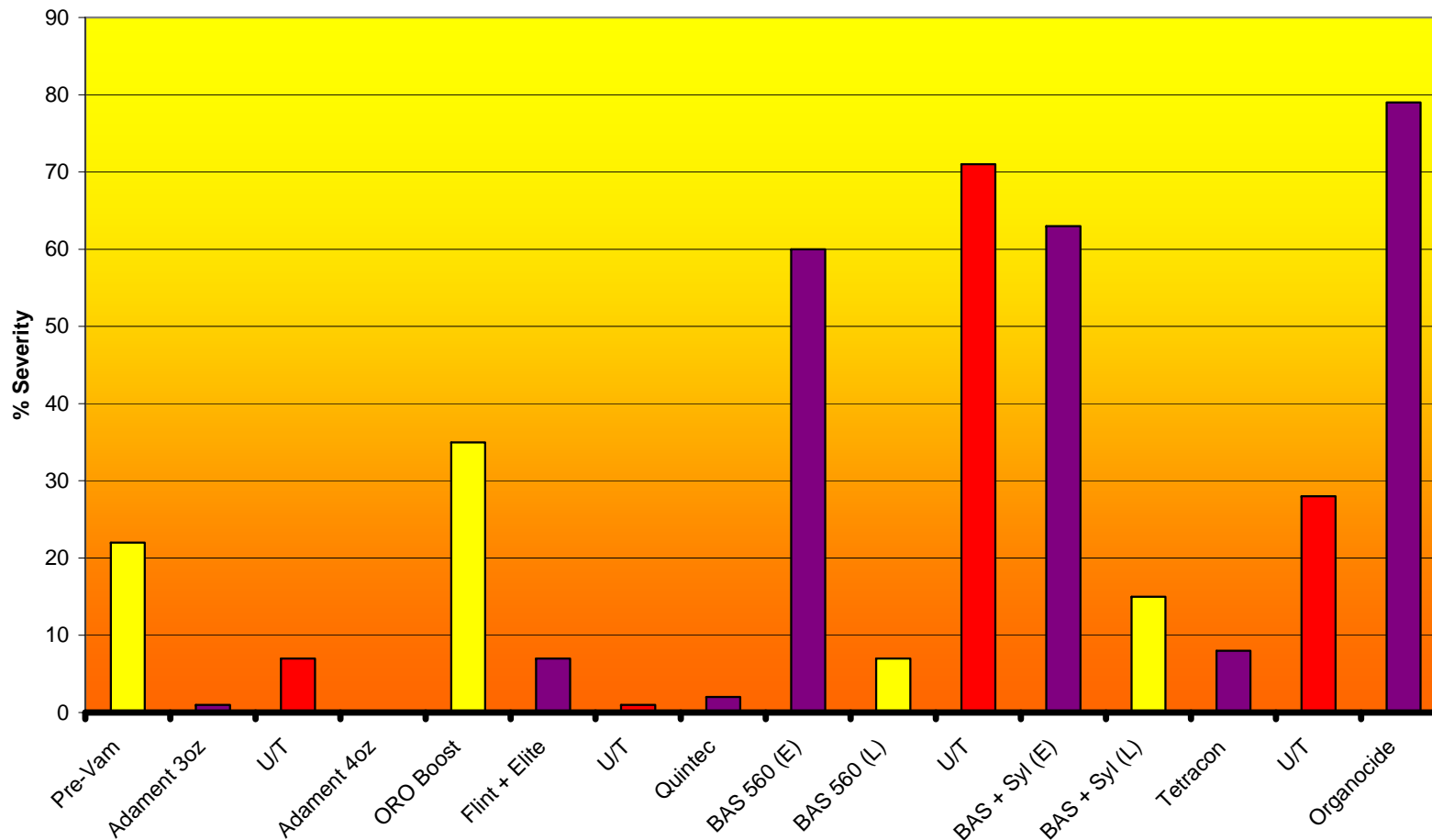
2008 Grape Mitecide Study - S. Quashnick / Boskisch Vineyards
Pacific Mite Counts - Adults / Leaf - All Intervals (Final)
CPR08024



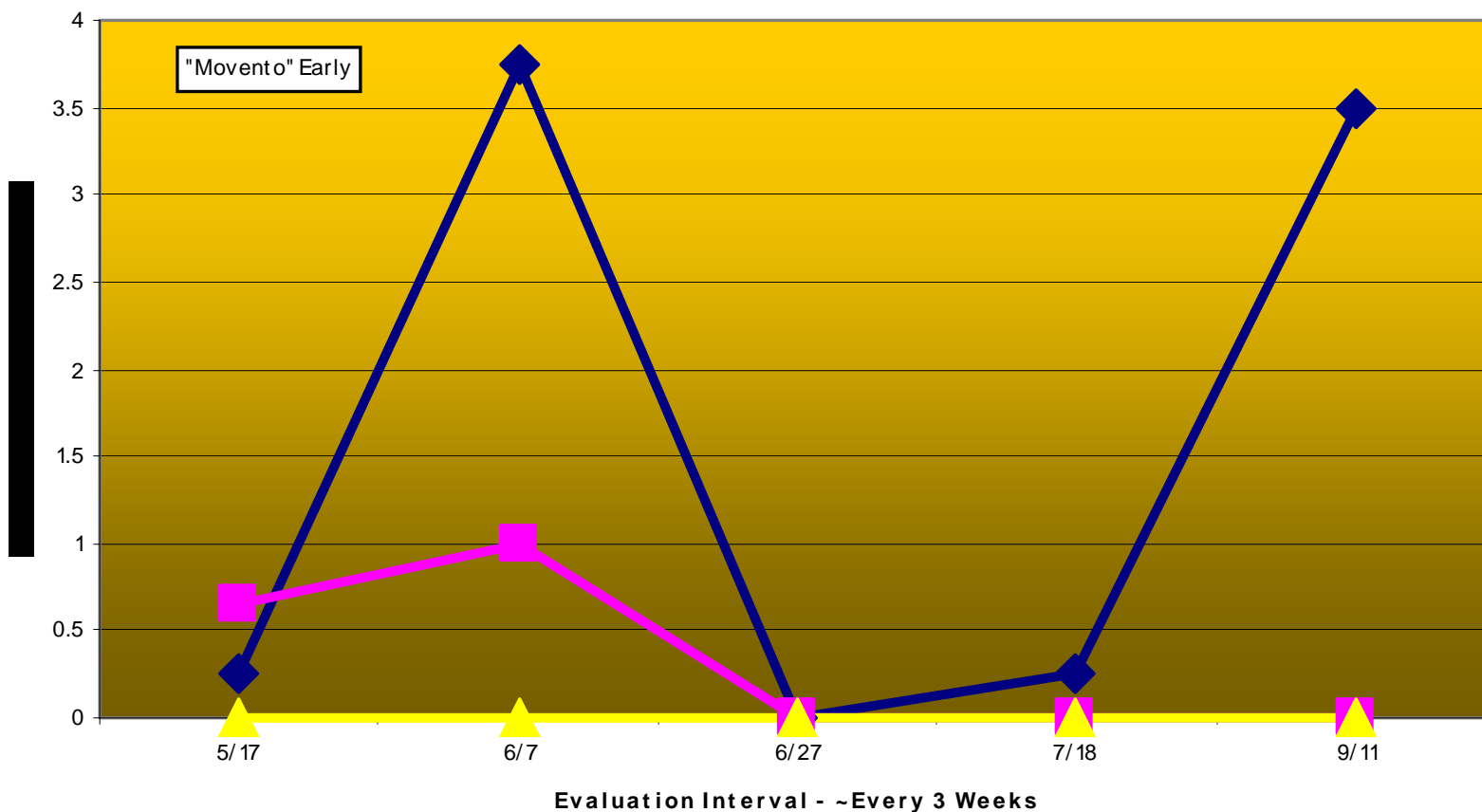
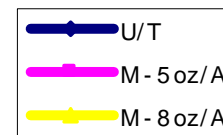
2008 WECO Healdsburg Organic Miticide Study - Hoot Owl Vineyards
Grape Pacific Mite Control - Average / Leaf (Adults + Nymphs)
CPR08141



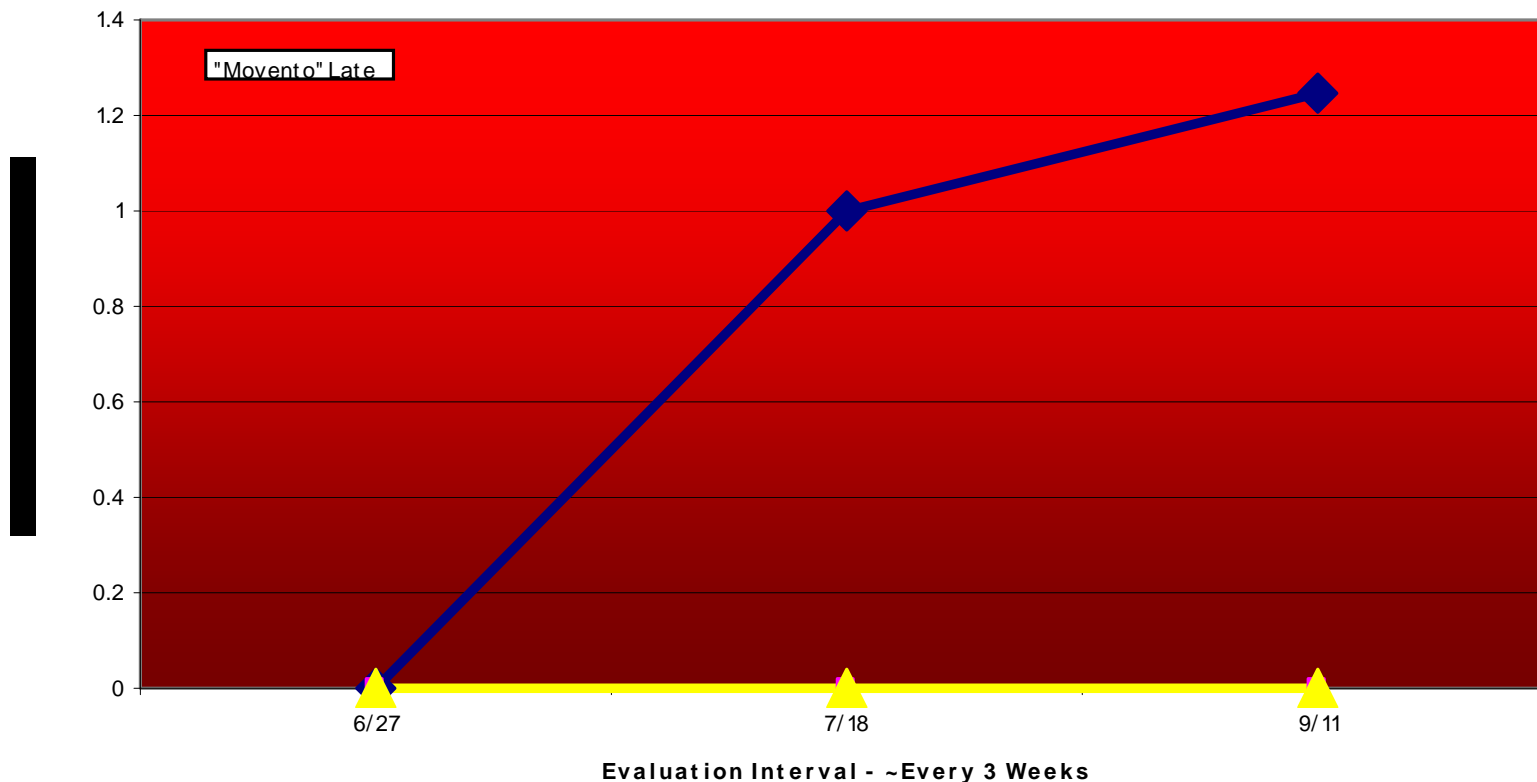
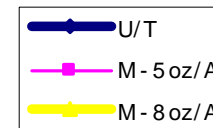
Those graphed in the color "purple" = "early" applications (starting 5/19/08)
 Those graphed in the color "yellow" = "late" applications (starting 6/30/08)
2008 Grape Powdery Mildew Trial - Syar Vineyards / A. Azevedo
Final Powdery Mildew Evaluations - % Severity (Ave 5 Vines)
CPR08023
 untreated areas are graphed in the color "red"



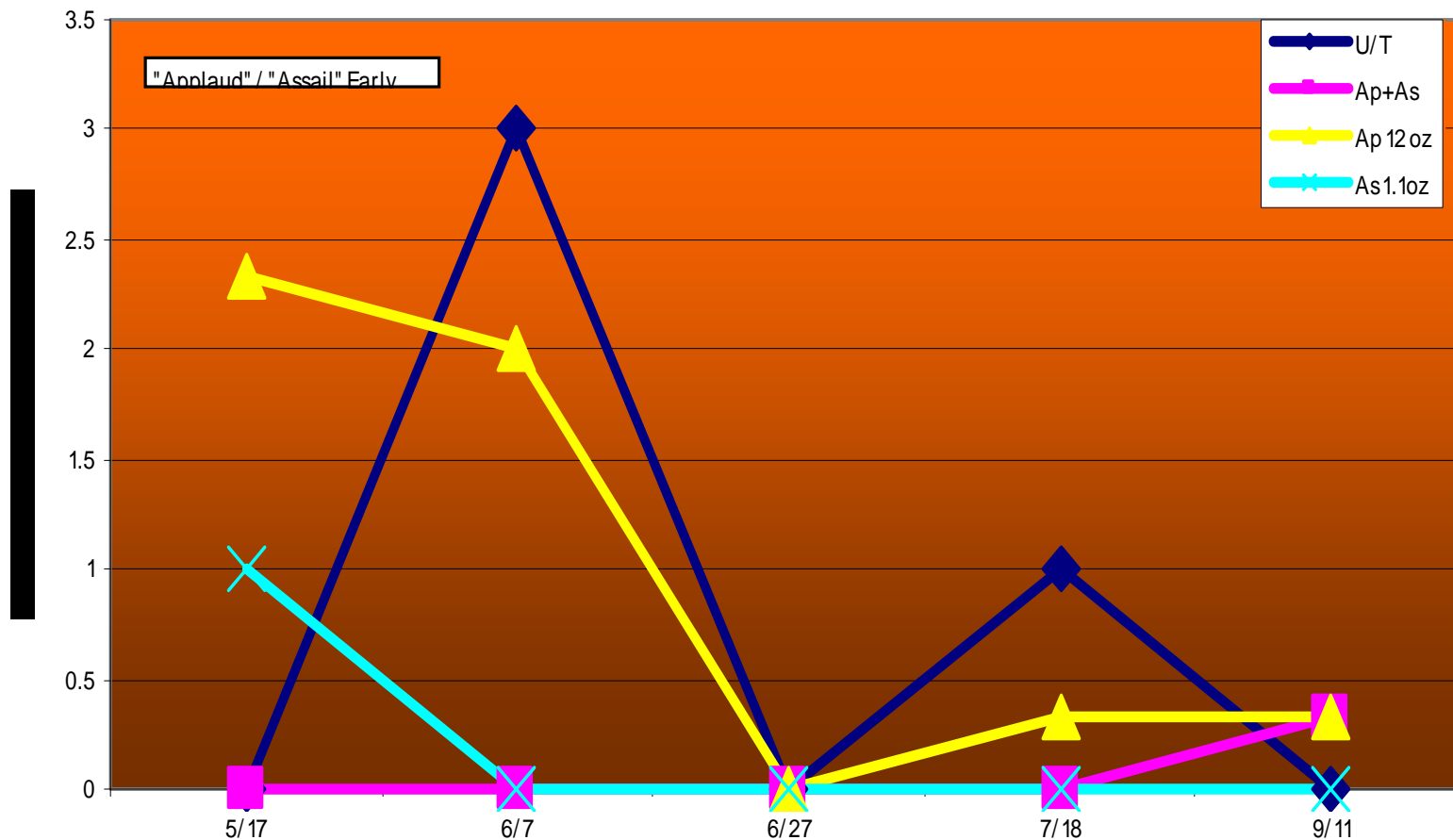
"Movento" Early Treatments - KJ Carneros Adult Grape Mealybug - Mean Values. CPR07107



**"Movento" Late Applications - KJ Carneros
Adult Grape Mealybug - Mean Values. CPR07107**

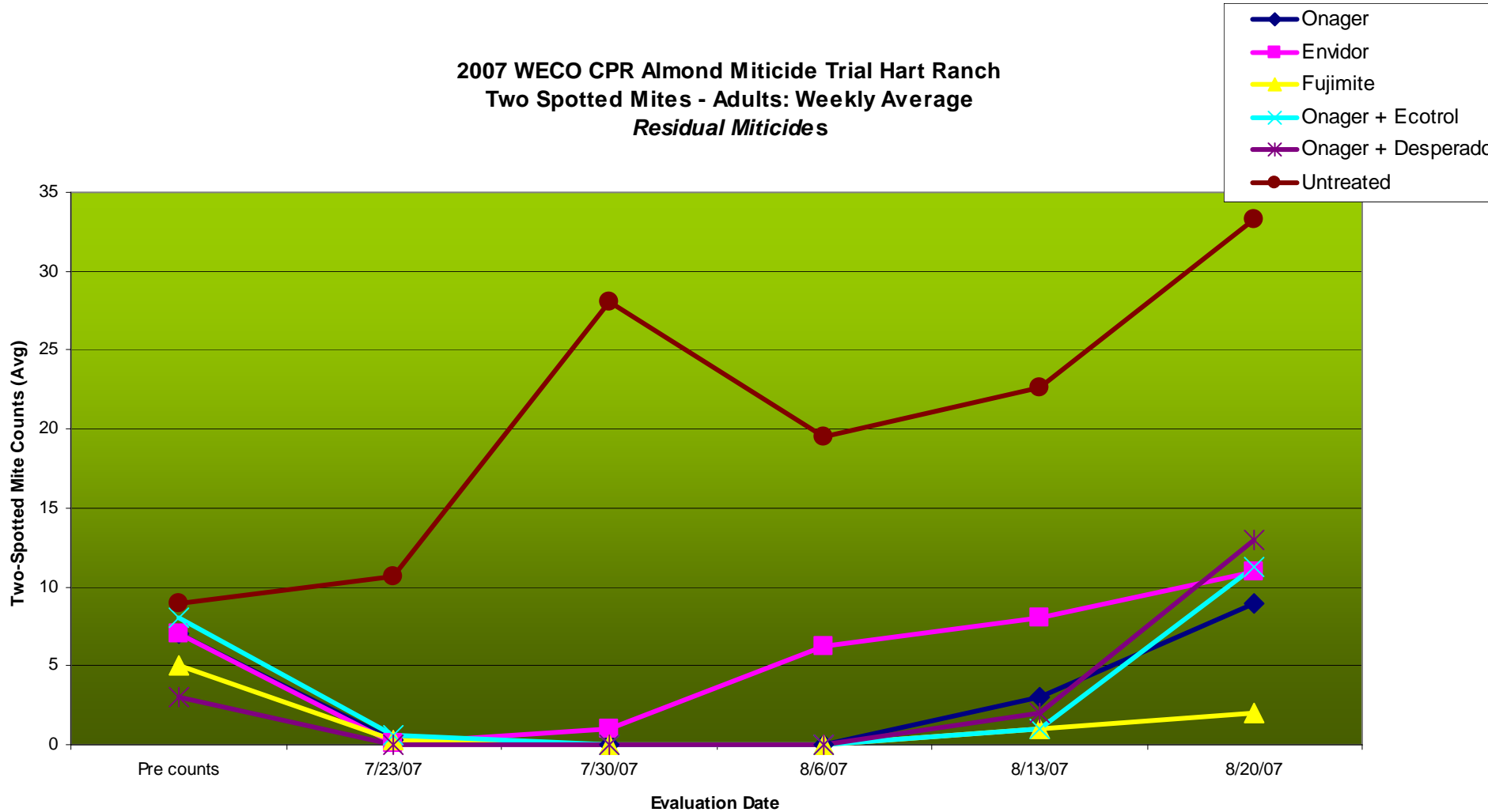


Applaud / Assail Early - KJ Carneros Adult Grape Mealybug Mean Values. CPR07107



Evaluation Interval - ~ Every 3 Weeks

2007 WECO CPR Almond Miticide Trial Hart Ranch
Two Spotted Mites - Adults: Weekly Average
Residual Miticides



FROST RECOVERY

Site #1 Severe Damage – Gallo (Merlot) – Vegetative Evaluations:

<u>No.</u>	<u>Product</u>	<u>June 30th Combination Ratings (Group A,B,C)</u>	<u>October 21st Combination Ratings (Group A,B,C)</u>
• 1	NDemand	+++	+++
• 2	Foli Gro Essential	+	=
• 3	Mora Leaf Hi K	=	+
• 4	Rescue	=	+
• 5	Foli Gro Ca Zn	+	=
• 6	BioForge	++	=
• 7	BioLink	++	=
• 8	NDemand + M. Leaf Hi K	++	++
• 9	NDemand + F. Gro Ess	+++	+++
• 10	NDemand + Rescue	+++	=/+
• 11	NDemand + PKZB	=	=
• 12	Pristine	=/--	=

This scale is based on the following criteria:

“=”	“No growth advantage” (versus the adjacent buffer row)
“+”	“An observable growth advantage”
“-”	“Negative growth effects”
“=/+”	“A slight growth advantage”
“=/--”	“Slightly negative growth effects”

CONCLUSIONS

- PEAS AND OTHER MODELS CAN BE VALUABLE DECISION MAKING TOOLS
- NEWER PESTICIDE HAVE MUCH LESS IMPACT
- LOW IMPACT PESTICIDES ARE COMMONLY USED IN TRADITIONAL VITICULTURE SYSTEMS
- SCOUTING AND PROPER TIMING ARE CRITICAL ELEMENTS OF ANY PESTICIDE TREATMENT PROGRAM
- REMEMBER.... EVEN LOWER IMPACT PESTICIDES CAN BE POOR CHOICES IF USED IMPROPERLY!