

New Miticides: What's Coming Up?

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Two spotted spider mite

Management strategies -

Plant vigor -

vernalization

summer planting

fumigation

Biological control -

predatory mites (augmentation)

generalist predators (conservation)



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Two spotted spider mite

Damage -

Yield reduction (fewer fruit, not fruit size)

Greatest impact in early season
(bud differentiation?)

Monitoring - avg. mites per midtier leaflet

Threshold -

Early season - <5 mites / midtier leaflet

Later season - 15 - 20 mites / midtier leaflet

What's Registered?

Agrimek (abamectin)

Savey (hexythiozox)

Valero (cinnamic aldehyde)

Omni Supreme (mineral oil)

Kelthane (dicofol)

Vendex (fenbutatin-oxide)

Beauvaria bassiana

Not recommended:

Danitol (fenpropathrin)

Brigade (bifenthrin)

What's Not?

Mesa (milbemectin) *

Acramite (bifenazate) *

Pyramite (pyridaben) *

Secure (etoxizole) *

Ecosmart (rosemary oil) *

Alert (chlorfenapyr) *

TM-41301 *

*** registration soon?

Two spotted spider mite

Current -

Winter mite control (Omite/ propargite)

Agrimek

Omni Supreme oil

Savey

Spring/ Summer mite control (resistance)

Agrimek

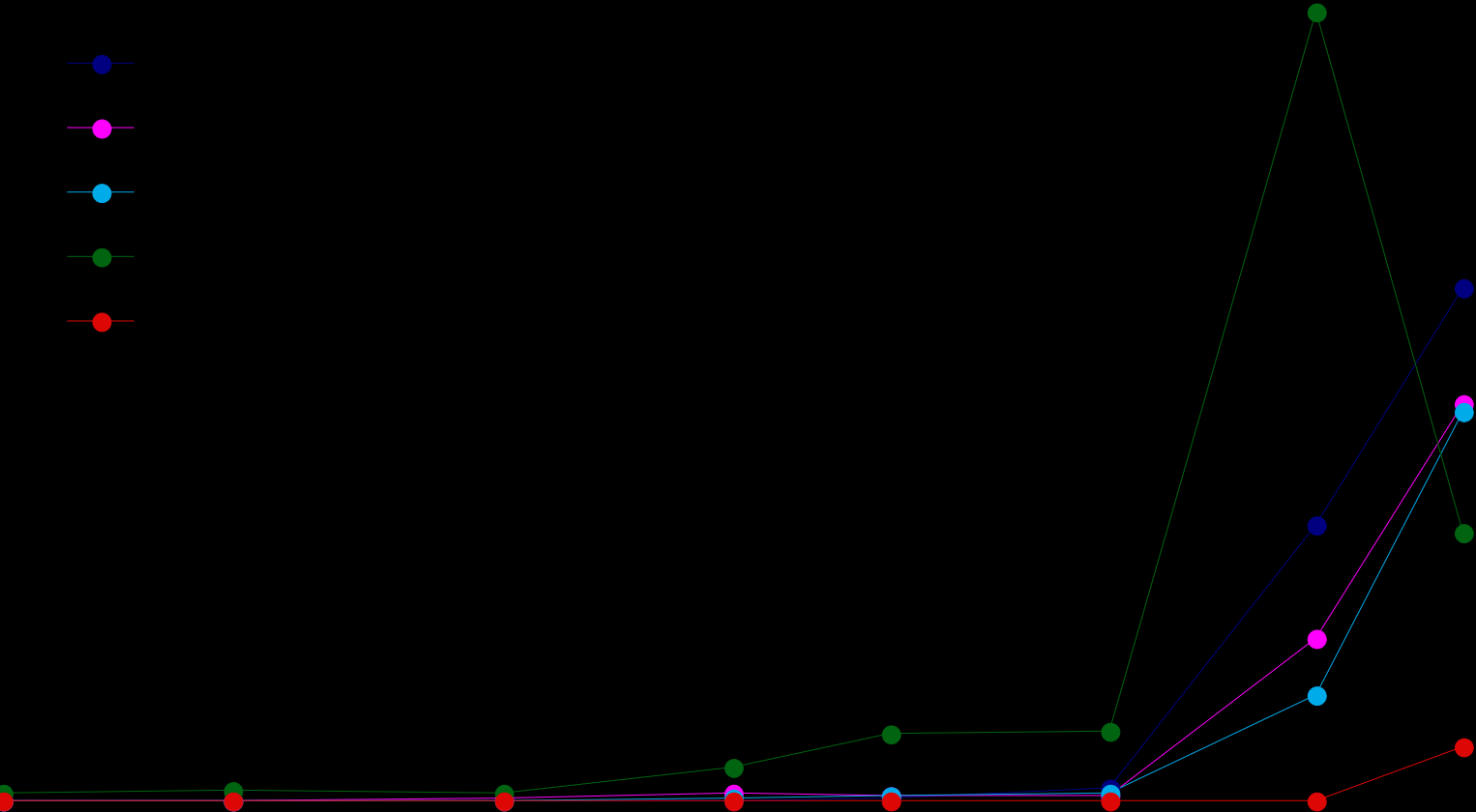
Savey

Valero

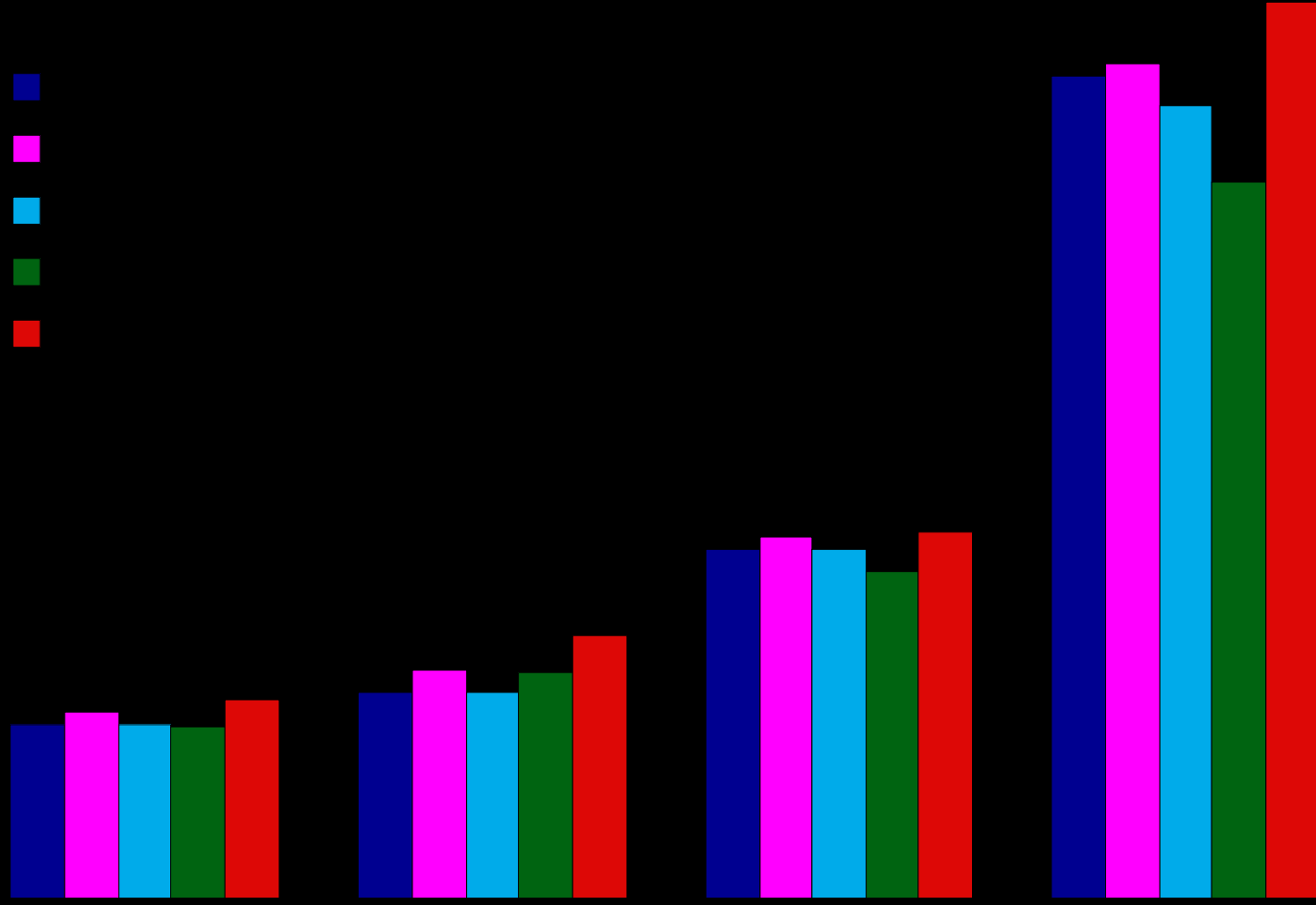
Mites per leaflet



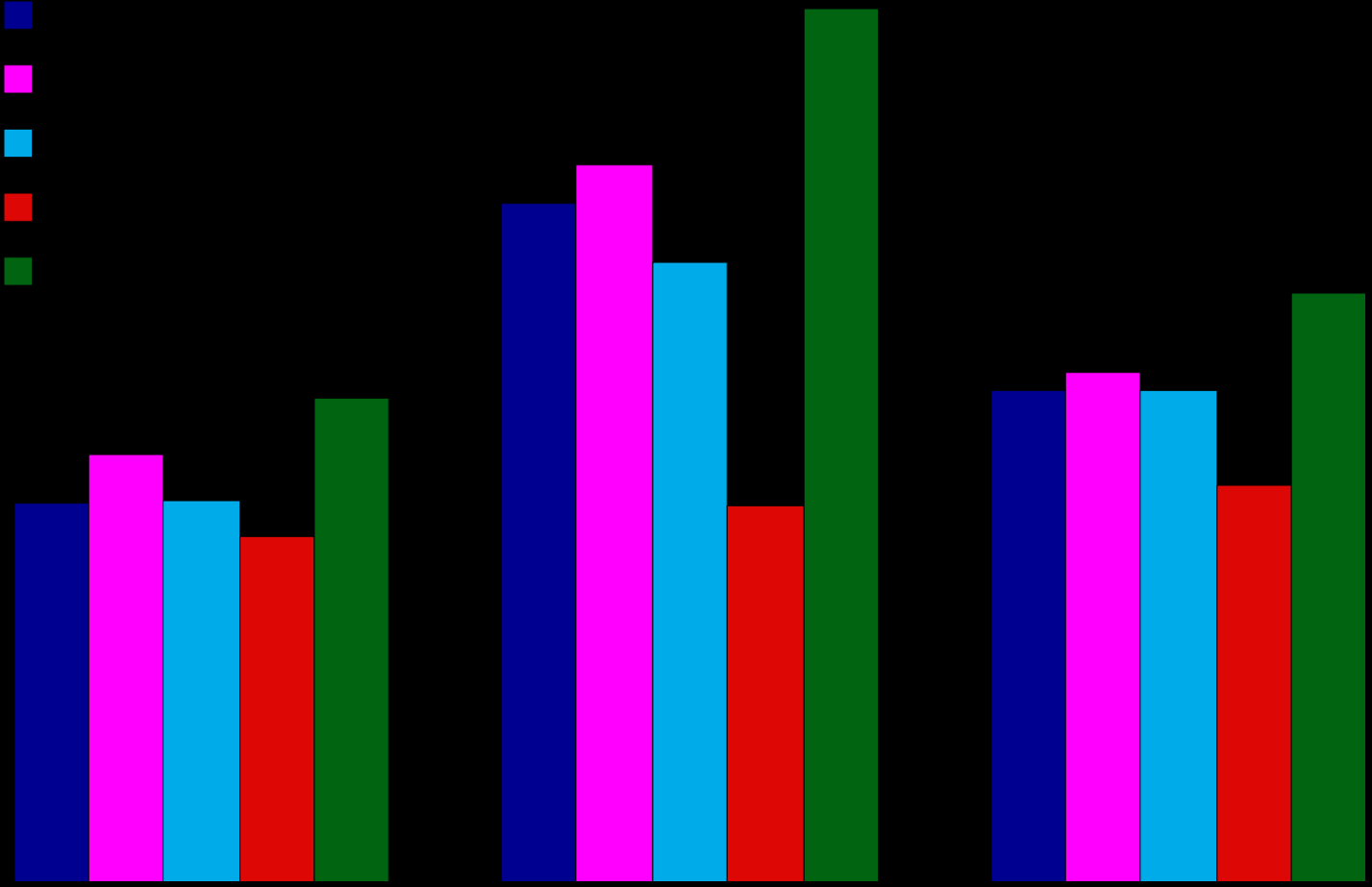
12/19/95 1/2/96 1/16/96 1/30/96 2/13/96 2/27/96 3/12/96 3/26/96 4/9/96 4/23/96 5/7/96



Trays per acre



Pounds per acre



Two spotted spider mite

Proposed -

Winter mite control -

Mesa (milbemectin) + oil

Omni Supreme oil

Acramite (bifenazate)

Alert (chlorfenapyr)

Pink = not registered

Two spotted spider mite

Proposed -

Spring/ Summer mite control -

Agrimek

Savey

Mesa (milbemectin)

Acramite (bifenazate)

Secure (etoxizole)

Alert (chlorfenapyr)

Pink = not registered

Two spotted spider mite

Proposed -

Organic -

Ecosmart (Spring/ Summer)

Beauvaria bassiana (Spring/ Summer)

Omni Supreme oil (Prebloom only)

predator mite releases

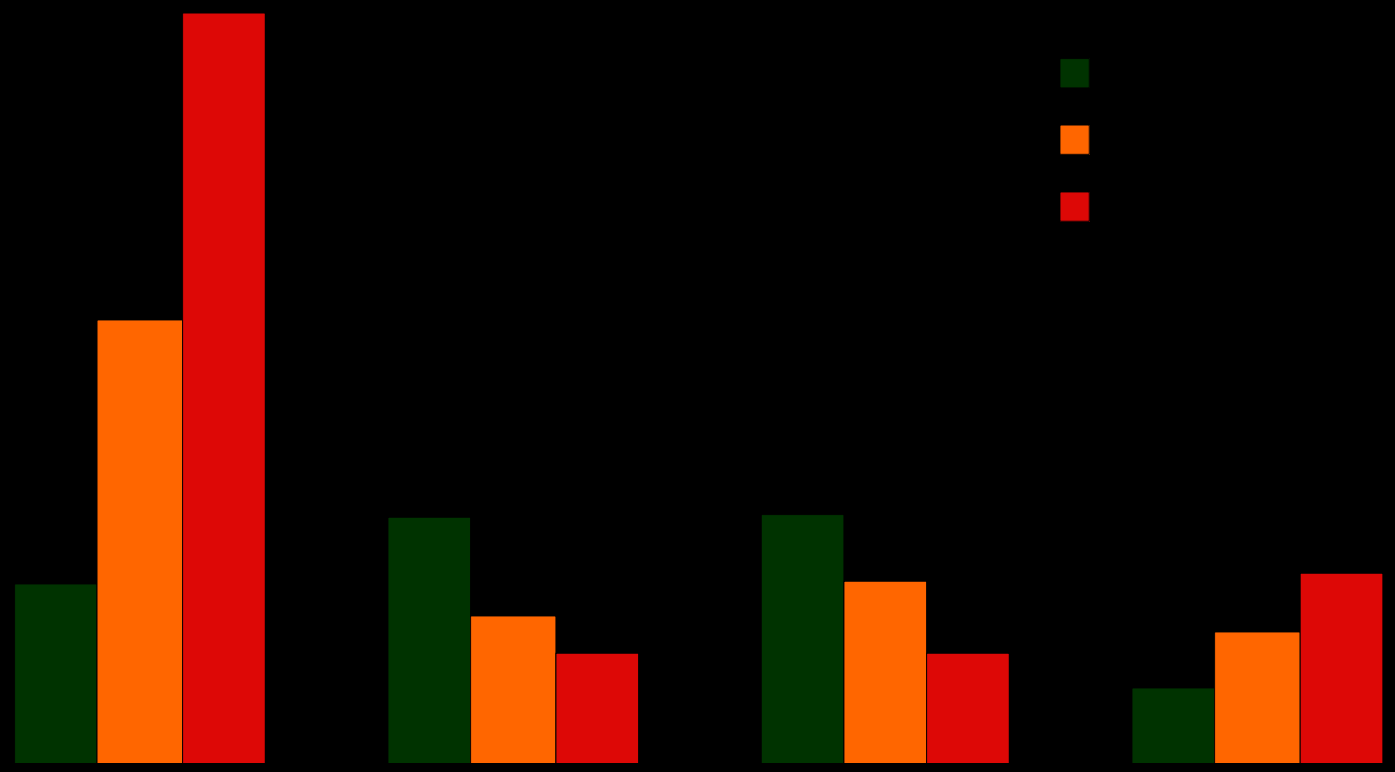
Phytoseiulus persimilis

Neoseiulus facillis

Euseius californicus

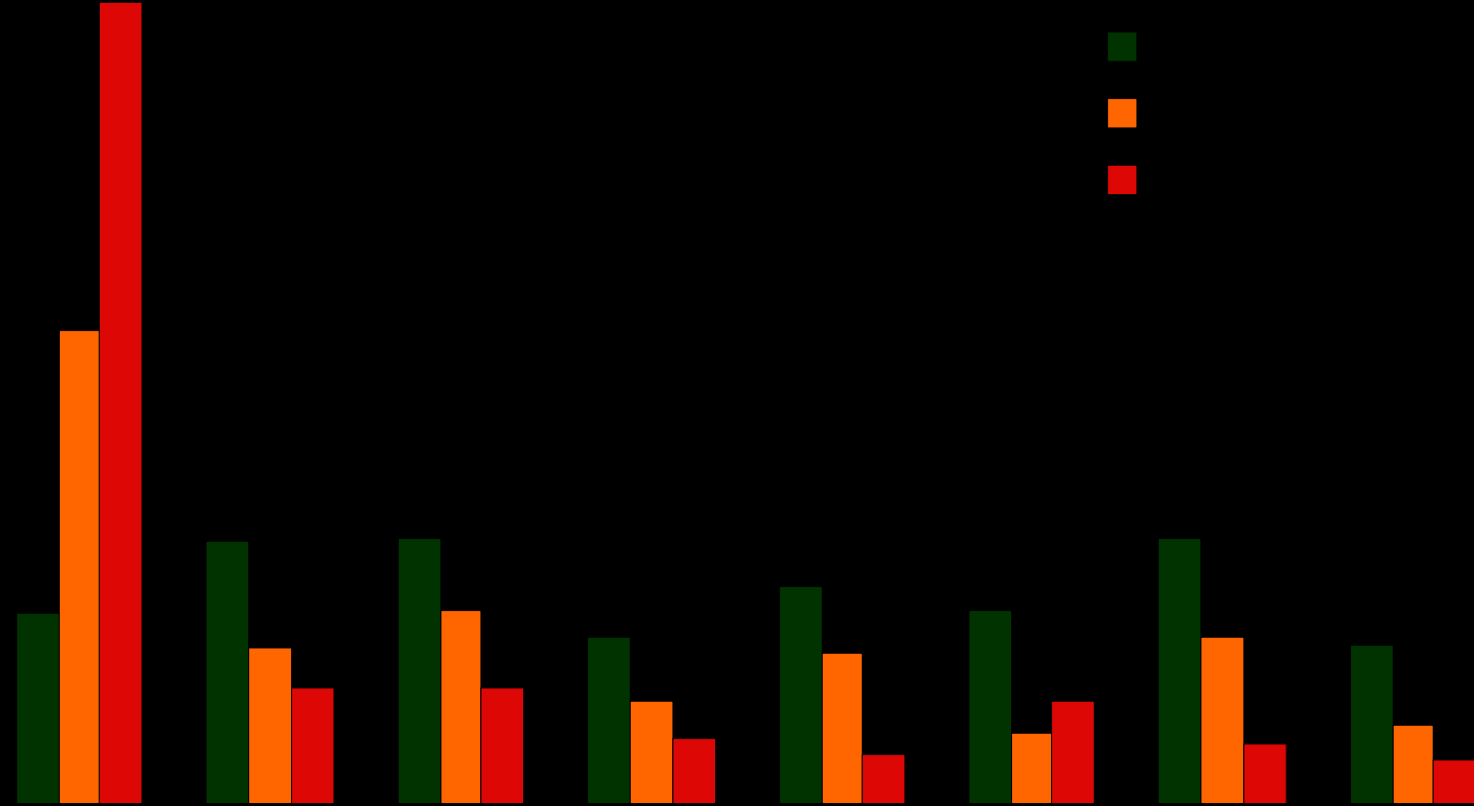
Pink = not registered

Mites per leaflet

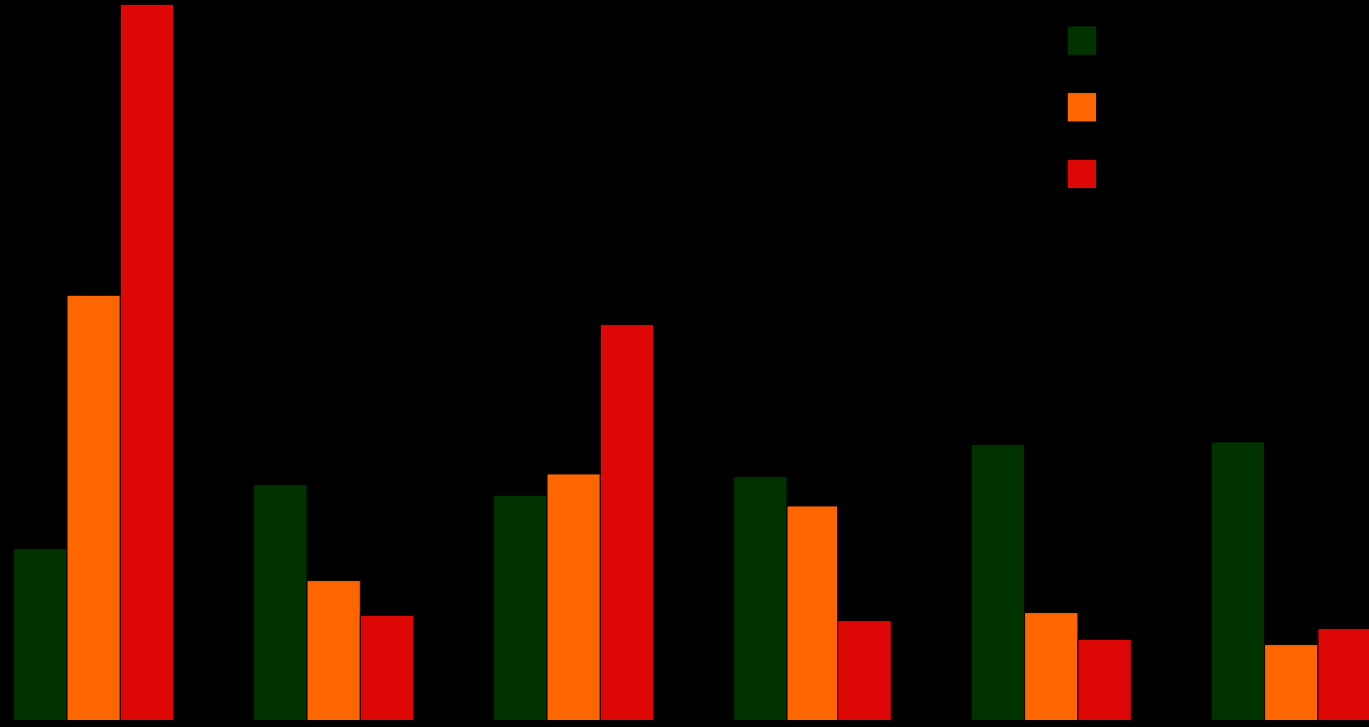


First treated 6/3/01

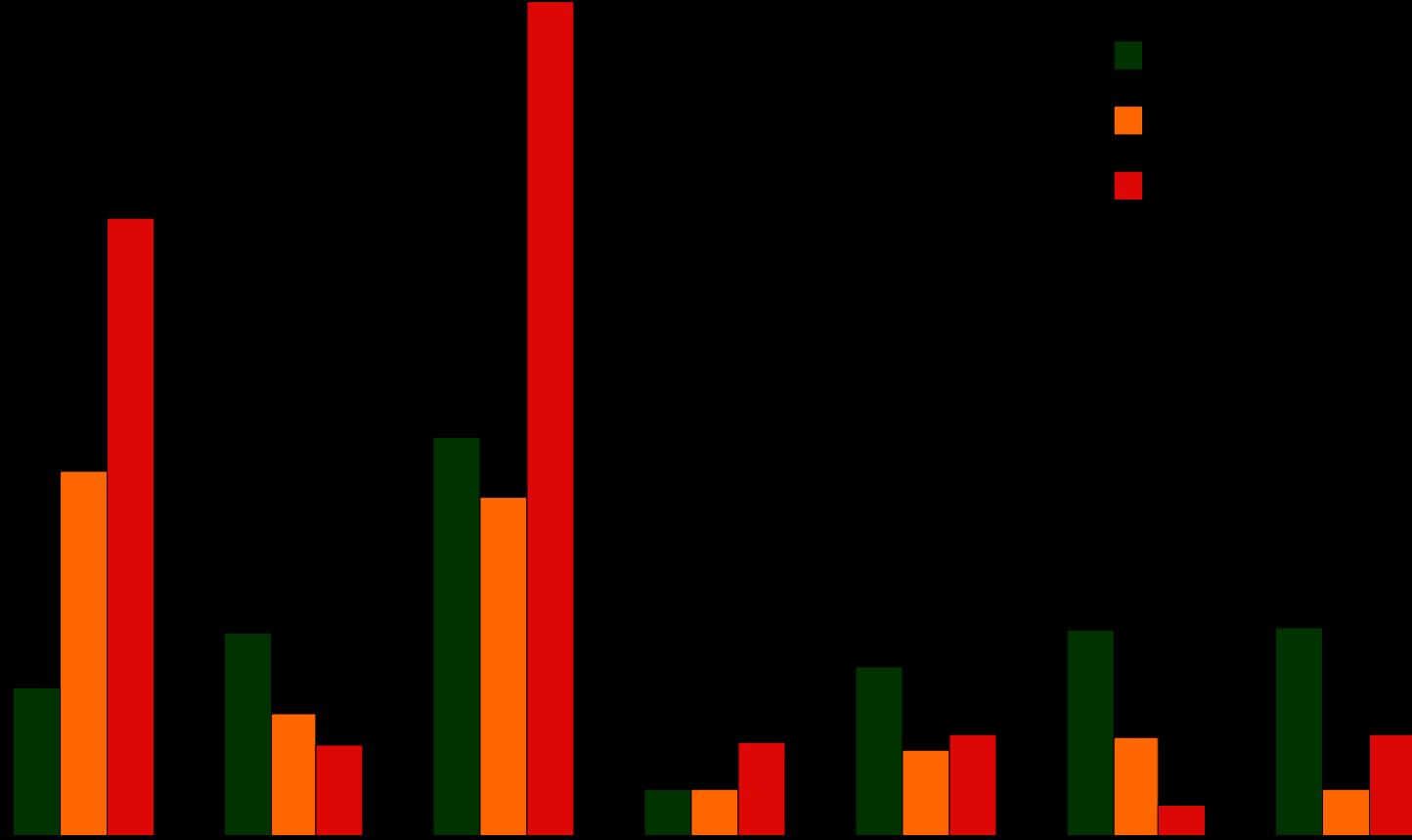
Mites per leaflet



Mites per leaflet



Mites per leaflet



Mean \pm SE mites per leaflet, Watsonville, CA, Spring, 2000

Treatment	Rate (ai/acre)	Spray Dates		Pre-treat 5/19/00	Week 1 5/26/00	Week 2 6/2/00	Week 3 6/9/00
		5/19	5/26				
untreated	--	x	x	17 \pm 5	14 \pm 8	3 \pm 2	2 \pm 1
Αγριμ εκ	0.0188 λβ	ξ	ξ	7 \pm 4	2 \pm 1*	2 \pm 2	0.3 \pm 0.1*
Αχρομιτε	0.5 λβ	ξ		13 \pm 7	0.5 \pm 0.2*	0.2 \pm 0.1*	0 \pm 0*
Αχρομιτε	0.25 λβ	ξ	ξ	22 \pm 21	1 \pm 1*	0.2 \pm 0.1*	0.1 \pm 0.1*
Σεχυρε	0.045 λβ	ξ		12 \pm 2	3 \pm 2*	1 \pm 1*	1 \pm 1*
Σεχυρε	0.09 λβ	ξ		7 \pm 4	1 \pm 1*	0.4 \pm 0.3*	0 \pm 0*
Μεα	32 οζ ^{1/}	ξ	ξ	7 \pm 4	3 \pm 2*	0.2 \pm 0.1*	0.2 \pm 0.1*
Μεα	48 οζ ^{1/}	ξ		4 \pm 3	0.3 \pm 0.1*	0 \pm 0*	0 \pm 0*

*Spider mite density for this date is significantly different from the untreated control plots by pairwise t-tests at $P < 0.05$

^{1/}Formulated product amount

Mites per leaflet, Santa Clara, CA, 2000

Treatment	Rate (ai/ac)	Spray Dates		Pre- treat 3/22/00	Week 1 3/30/00	Week 2 4/6/00	Week 3 4/13/00	Week 4 4/21/00
		3/22	3/30					
untreated	--				14 ± 6	13 ± 7	10 ± 4	1 ± 1
Αγρι-μεκ	0.0188 λβ	*	*	18 ± 8	25 ± 19	1 ± 0*	0.2 ± 0.1*	0 ± 0
Αχρομ ιτε	0.25 λβ	*		21 ± 11	3 ± 2*	1 ± 1*	0.3 ± 0.2*	0.1 ± 0.1
Αχρομ ιτε	0.5 λβ	*		8 ± 4	0.1 ± 0.1*	0.1 ± 0.1*	0.1 ± 0*	0.1 ± 0.1
Αχρομ ιτε	0.25 λβ	*	*	24 ± 11	8 ± 4*	3 ± 2*	0.2 ± 0.2*	0.1 ± 0.1
Σεχυρε	0.045 λβ	*		9 ± 4	4 ± 2*	2 ± 1*	3 ± 2*	1 ± 1
Σεχυρε	0.09 λβ	*		12 ± 5	4 ± 2*	2 ± 1*	0.4 ± 0.3*	0.1 ± 0.1
Πηρομ ιτε	0.3 λβ	*	*	8 ± 6	6 ± 5*	1 ± 1*	1 ± 1*	0.1 ± 0.1
Μεσα	32 οζ ^{1/}	*	*	22 ± 6	3 ± 1*	6 ± 5	1 ± 0.5*	0 ± 0
Μεσα	48 οζ ^{1/}	*		14 ± 2	3 ± 1*	3 ± 2*	1 ± 1*	0.1 ± 0.1
Σοαεψ+ Μεσα	0.188 β ^{1/} + 32 οζ ^{1/}	*		30 ± 24	2 ± 1*	3 ± 2*	3 ± 3	0.1 ± 0.1
Σοαεψ	0.188 β ^{1/}	*		12 ± 10	10 ± 6	10 ± 8	6 ± 3	0.1 ± 0.1
ς αλερο	0.2 %	*	*	23 ± 12	47 ± 27	35 ± 17	45 ± 25	26 ± 18
TM-41301	0.3 β	*		39 ± 31	16 ± 8	10 ± 5	3 ± 2	0.1 ± 0.1

* Spider mite density for this date is significantly different from the untreated control plots by pairwise t-tests at $P < 0.05$

¹ Formulated product amount

Mean \pm SE mites per leaflet, Irvine, CA, Winter, 2000

Treatment	Rate (ai/acre)	Spray Dates		Pre- treat 1/12/00	Week 1 1/20/00	Week 2 1/26/00	Week 3 2/2/00	Week 4 2/10/00	Week 5 2/21/00
		1/12	1/20						
untreated				9 \pm 2	14 \pm 7	10 \pm 3	8 \pm 2	4 \pm 2	11 \pm 10
Αγρι-μεκ	0.0188 β	ξ	ξ	16 \pm 12	4 \pm 2*	1 \pm 1*	2 \pm 2*	0 \pm 0*	0 \pm 0*
Αχραιτε	0.25 β	ξ		10 \pm 2	9 \pm 2	2 \pm 1*	5 \pm 2*	0.1 \pm 0*	0.1 \pm 0*
Αχραιτε	0.38 β	ξ		3 \pm 1	2 \pm 1*	1 \pm 1*	0.1 \pm 0*	0 \pm 0*	0.1 \pm 0*
Αχραιτε	0.5 β	ξ		11 \pm 3	3 \pm 0*	2 \pm 0.2*	1 \pm 1*	0.3 \pm 0.2*	0.1 \pm 0*
Αχραιτε	0.25 β	ξ	ξ	19 \pm 17	13 \pm 12	4 \pm 2*	3 \pm 2*	0.1 \pm 0.1*	0.1 \pm 0*
Σεχυρε	0.045 β	ξ		11 \pm 8	3 \pm 1*	3 \pm 2*	1 \pm 1*	0.1 \pm 0*	0.3 \pm 0*
Σεχυρε	0.09 β	ξ		11 \pm 5	7 \pm 3	7 \pm 5*	5 \pm 3*	1 \pm 1*	2 \pm 2*
Πυρομ ιτε	0.3 β	ξ	ξ	10 \pm 7	5 \pm 1*	5 \pm 3*	1 \pm 0*	0.4 \pm 0.1*	2 \pm 2*
Μεσσα	48 οζ ^{1/}	ξ		8 \pm 3	3 \pm 0*	1 \pm 0.1*	0.3 \pm 0*	0 \pm 0*	0 \pm 0*
Μεσσα	32 οζ ^{1/}	ξ	ξ	10 \pm 4	3 \pm 1*	0.3 \pm 0.1*	0 \pm 0*	0 \pm 0*	0 \pm 0*
ς αλφο	0.2 % ^{1/}	ξ	ξ	11 \pm 3	9 \pm 3	12 \pm 2	2 \pm 0*	2 \pm 1*	4 \pm 1*
Σαωεψ	0.1875 β	ξ		7 \pm 2	4 \pm 1*	5 \pm 3*	0.4 \pm 0*	0.2 \pm 0.1*	0 \pm 0*

*Spider mite density for this date is significantly different from the untreated control plots by pairwise t-tests at $P < 0.05$

^{1/}Formulated product amount

Predator bioassays -

Species tested -

Phytoseiulus persimilis

Chrysoperla carnea - green lacewing

Orius insidiosus - minute pirate bug

Methods - contact and residual bioassay

Length of exposure - 72 hours



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Predator bioassays for registered and non-registered strawberry acaricides. Proportion of field rate that killed 50% of the test specimens (LD50).

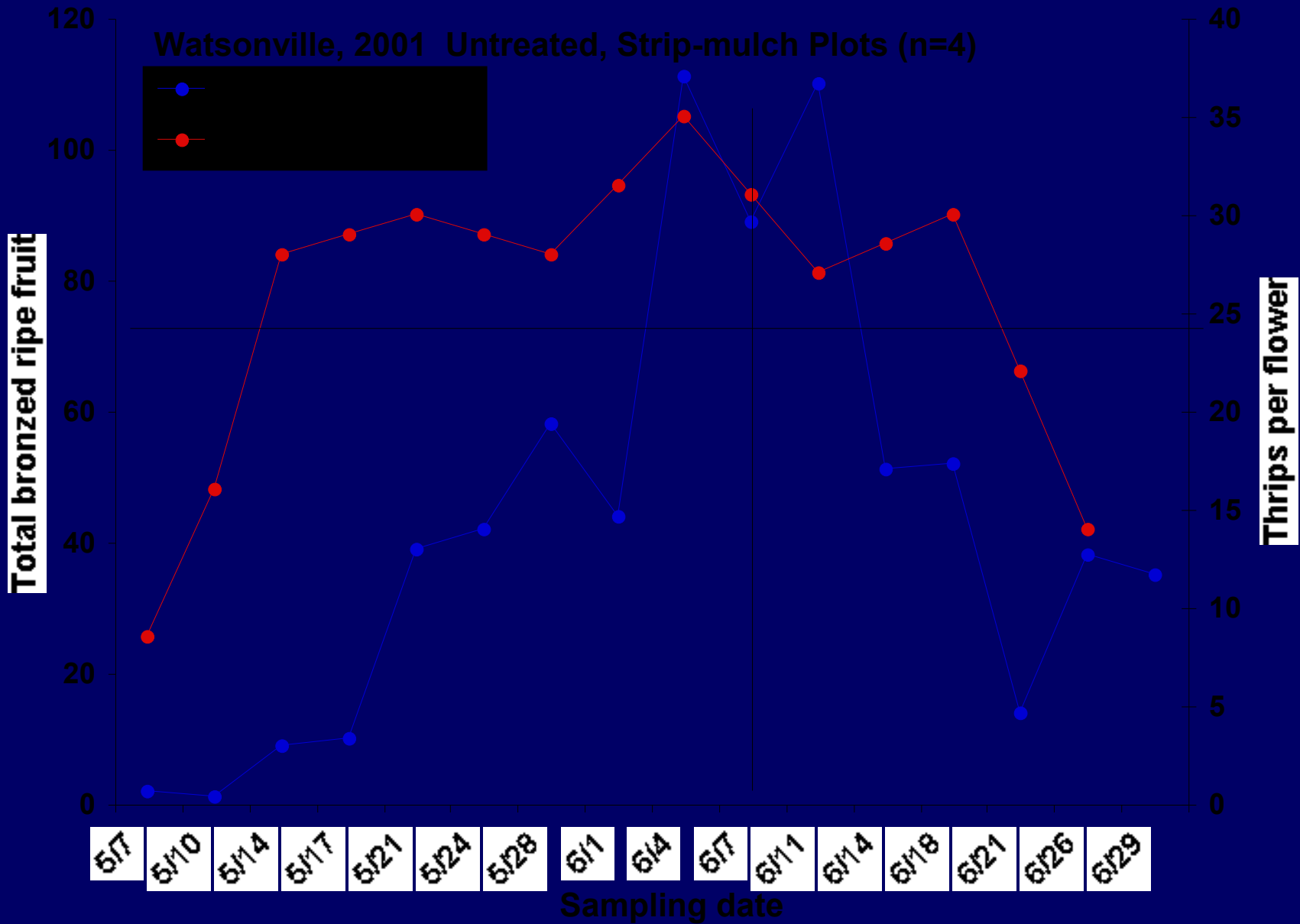
Trade name	Chemical	Field Rate (a.i./acre)	<i>P. persimilis</i>	Lacewing	<i>Orius sp.</i>
Agrimek	Abamectin	0.0188 lbs	0.54	3.93	0.12
Mesa	Milbemectin	48 oz* ^{/1}	0.38	5.13	0.33
Acramite	Bifenazate	0.38 lb^{/1}	87.23	>100.00	60.00
Secure	Etoxizole	0.09 lb^{/1}	>100.00	>100.00	5.73
Savey	Hexythiazox	6 oz*	>100.00	>100.00	100.00
Pyramite	Pyridaben	0.3 lb^{/1}	0.10	>100.00	0.06
Valero	Cinnamic aldehyde	0.2%	0.79	5.93	2.53

*** Formulated rate**

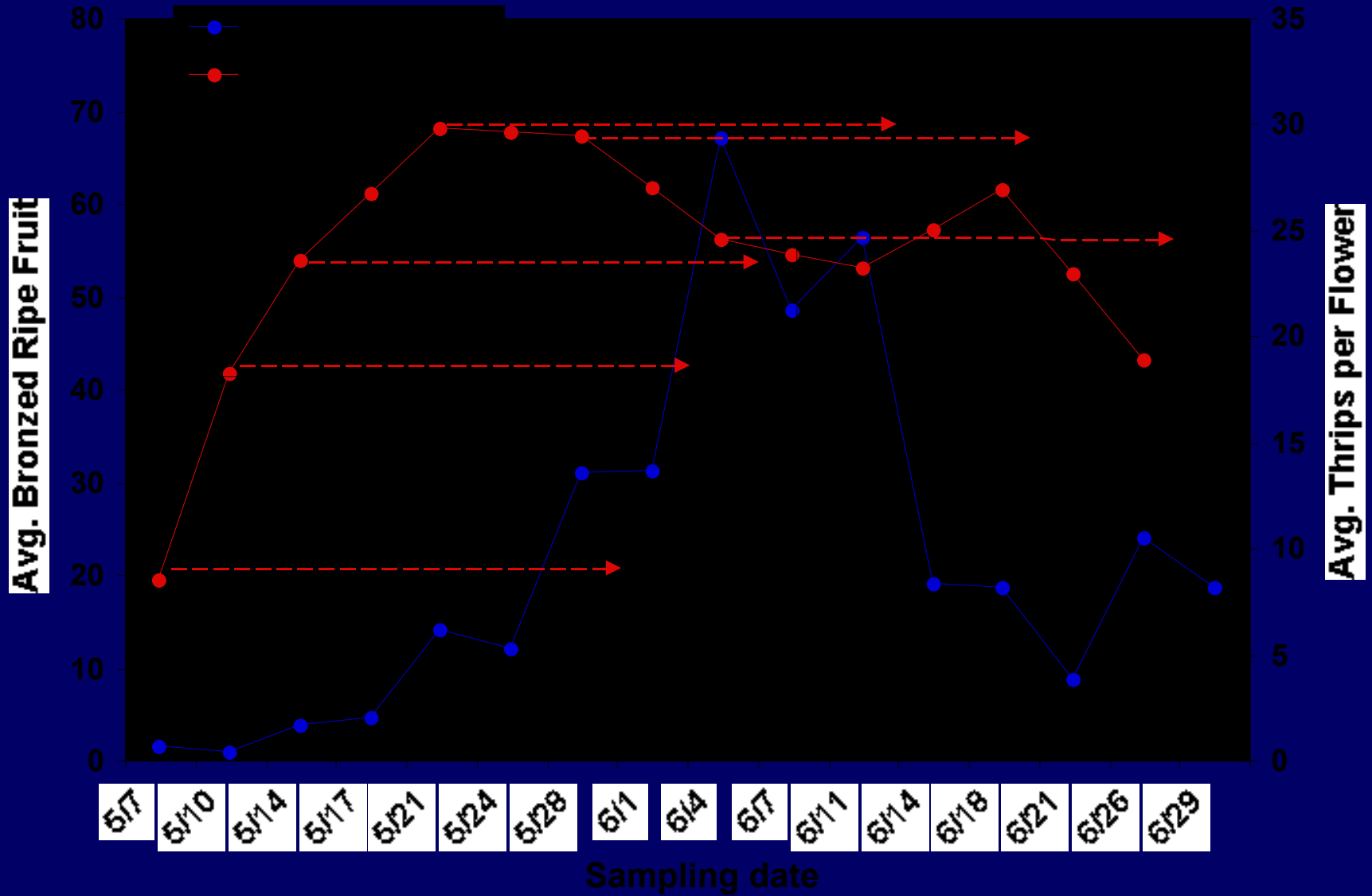
¹ These chemicals are not currently registered on strawberry.

LD50 values are mean of 3 trials.

Untreated controls all had > 90% survival after 72 hours.



Watsonville, 2001, Summary of All Plots (n=26)



Watsonville, 2001, Summary of All Plots (n=26)

