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### PERSEA MITE SPRAY TRIAL

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Persea mite (*Olygonychus perseae*) has caused significant damage to the avocado industry since its introduction to California in 1991. Biological control methods are being developed and studied, but the severity of infestation in some cases warrants some sort of chemical control to prevent damage to the fruit and tree.

In summer 1995, eight different materials (*Table 1*) were evaluated for their miticidal properties. The rates used were those recommended by the manufacturer, so a higher rate of a given material might give different results.

Treatments for the first miticide screening trial were applied on July 19, 1995, at the Lamb Ranch in Camarillo. There were no differences between treatments, including the water check. All treatments resulted in over 75% reduction in the persea mite population from the pre-treatment count levels (*Table 1*). It is likely that the high pressure hand gun treatment (150-200 psi) was physically quite disruptive of mite colonies, resulting in the success of the water alone treatment.

Predaceous mite levels were very low throughout the trial period and were not significantly impacted by any of the treatments. Some treatments, such as Vendex and Omite, appeared to lower the predaceous mite levels more than others. Similarly, although not significantly, some treatments, such as Neem and Kelthane 35W at the 2X rate (8#/ac), did not appear to reduce the persea mite as much as the other treatments, and were omitted from the second trial.

Treatments for the second trial were applied on August 22, 1995, at the Donlon Ranch in Somis. These treatments (*Table 2*) were applied as a light mist to run-off, using Solo backpack sprayers to avoid the high pressure effects experienced in the first trial and to more closely mimic an aerial application. Most of the coastal avocado acreage is on steep hillsides not amenable to ground application and requiring aerial application of micro nutrients and pesticides.

In this second trial, Kelthane and Omite treatments consistently gave the greatest knockdown on persea mites, while Agri-mek plus NR 435 oil plus Terminator surfactant gave the third best performance (*Table 2*). In the last two of the four weekly post-treatment assessments, the Omite treatment had the lowest persea mite levels, although not significantly lower than the Kelthane treatment. Although on the first post-treatment assessment the NR 435 oil plus Terminator surfactant treatment was not significantly different from either the untreated or the water check treatments, it gave excellent mite control after a second application on August 30, when the rates of oil and Terminator were increased by 8 times. No phytotoxicity was observed from this high

rate of oil. Unfortunately, phytotoxicity resulted in severe leaf drop with the top candidate miticide, Kelthane 35W.

In a third and final trial (*Table 3*), Omite, NR 435 oil plus Terminator, NR 435 oil alone, and Organic Solutions Material (diatomaceous earth plus pyrethrin) were applied October 13, 1995. Again, the Omite and NR 435 oil plus Terminator treatments were the best and not significantly different from NR 435 oil alone, while the Organic Solutions product gave the poorest performance and was not significantly different from the water check.

All plots in both trials were designed by ranking the pre-treatment counts for each tree from high to low and "blocking" the trees into "11" replicates of similarly mite-infested trees within which treatments were randomly assigned.

In summary, for avocado orchards on relatively flat terrain which can be accessed via ground spray equipment, the most cost effective and environmentally benign treatment for perseia mites is a high pressure treatment using water only. For orchards which require aerial spraying, either Omite 30W at 10 lb/ac, or possibly the high dosage (18.4%) of NR 435 oil plus Terminator (4.2 gal/100) are the best options of those tested in these trials.

**Table 1. 1995 Persea Mite Trial - Lamb Ranch, Camarillo, CA.**

<b>% Mites Per 25% Leaf Area Relative to Pre-Treatment Levels</b>							
<b>Treatment</b>	<b>Material</b>	<b>Rate</b>	<b>7/13</b>	<b>7/24</b>	<b>7/27</b>	<b>8/3</b>	<b>8/10</b>
1	Agrimek + NR415 oil	10 oz./ac. ¼% Oil	100	18.2*ns	32.3*ns	7.5*ns	7.8*ns
2	Agrimek + NR415 oil + Terminator	2 oz./ac. 1 qt./ac. 1½ gal./ac.	100	26.5	28.5	8.0	10.9
3	Alert	0.3 #ai/ac. (0.15 gal./ac.)	100	25.4	30.2	8.4	8.9
4	NR415 oil + Terminator	4 gal./ac. 1 gal./ac.	100	22.7	25.6	7.3	9.0
5	Carlton #717 + NR415 oil	1 gal./ac. 4 gal./ac.	100	20.5	21.8	5.4	8.6
6	Neem oil	0.5% (1 gal/49 gal.)	100	31.8	36.9	7.3	11.6
7	Omite 30W	10 #/ac.	100	27.4	33.7	8.3	9.7
8	Vendex 50W	3 #/ac.	100	26.7	26.1	6.7	11.3
9	Kelthane35W 1x LatronB-1956	4 #/ac. 8 oz./100gal.	100	24.3	26.0	6.2	7.3
10	Kelthane 35W 2x Latron B-1956	8 #/ac. 8 oz./100gal.	100	36.2	39.2	7.9	10.1
11	Water	50 gal./10 trees	100	24.8	29.9	8.7	6.2

\*No significant differences between treatments using ANOVA and Duncan's LSD on Log(n+1) transformed mite count data.

Treatments were applied to run-off on 7/19/95 using handguns with drag lines from a 100 gallon truck mounted sprayer at 150-200 psi.

NOTES: 10 trees = 1/10 Ac. Small trees = 1/10 normal size ≈ 1/100 rate/Ac. Water used - 20-30 gals./10 trees to wet and run off.

**Table 2.** 1995 Persea Mite Trial - Donlon Ranch, Somis, CA.

Treatment/Material	Rate/Acre	Average Mites/Leaf** per Sample Date				
		8/17*	8/28	8/31	9/7	9/14
(1) Agrimek 0.15 EC NR415 oil	10 oz. ¼% Oil	17.94 <sub>NS</sub>	27.26 <sub>A</sub>	32.96 <sub>ABC</sub>	39.33 <sub>AB</sub>	39.08 <sub>BCD</sub>
(2) Agrimek 0.15 EC Terminator NR 435 oil	2 oz. 1 gal. 5 gal.	18.97	26.51 <sub>A</sub>	31.45 <sub>C</sub>	33.67 <sub>BC</sub>	26.78 <sub>CDE</sub>
(3) Alert 2 SC	0.15 gal.	17.77	37.84 <sub>A</sub>	46.39 <sub>AB</sub>	51.63 <sub>A</sub>	45.47 <sub>AB</sub>
(4) NR435 oil Terminator surfactant	8/22 8/30 5 gal. 36.7 gal. 1 gal. 8.4 gal.	19.15	34.79 <sub>A</sub>	2.79 <sub>F</sub>	8.45 <sub>E</sub>	7.78 <sub>F</sub>
(5) Carlton #717 NR435 oil	1 gal. 5 gal.	19.31	28.97 <sub>A</sub>	38.34 <sub>ABC</sub>	41.82 <sub>AB</sub>	40.53 <sub>AB</sub>
(6) Organic Solutions No Foam B Spreader	3# 48 oz. fl.	19.31	27.16 <sub>A</sub>	43.82 <sub>ABC</sub>	40.21 <sub>AB</sub>	41.89 <sub>AB</sub>
(7) Omite 50W	10 #	18.33	21.99 <sub>B</sub>	20.68 <sub>D</sub>	24.49 <sub>D</sub>	23.01 <sub>E</sub>
(8) Vendex 50W	3 #	19.01	34.52 <sub>A</sub>	33.60 <sub>BC</sub>	49.94 <sub>AB</sub>	43.01 <sub>ABC</sub>
(9) Kelthane 50W LatronB-1956	4 # 16 oz. fl.	19.26	10.56 <sub>C</sub>	9.93 <sub>E</sub>	26.70 <sub>CD</sub>	28.50 <sub>DE</sub>
(10) Water Check	200 gal.	18.75	37.41 <sub>A</sub>	52.38 <sub>A</sub>	53.60 <sub>A</sub>	58.88 <sub>AB</sub>
(11) Untreated Check		17.34	35.40 <sub>A</sub>	45.41 <sub>ABC</sub>	61.88 <sub>A</sub>	60.95 <sub>A</sub>

\*Pre-Treatment count, treatments applied 8/22/95.

\*\*Means = number persea mite adults/25% leaf area on a total of 5 leaves per tree as an average of 20 single tree replicates per treatment. Statistical analysis performed on log(n+1) transformed data. Means not showing a common letter are significantly different at p = 0.05 using ANOVA and Duncan's LSD test.

\*\*\*Terminator and oil treatment re-applied 8/30/95 at 7-8x initial rate of 159.7 ml Terminator plus 695 ml NR 435 oil/1 gal. water as a stand alone treatment. This re-treatment nullifies any post-treatment comparisons with other products after 8/30/95.

**Table 3.** Oct.-Nov. 1995-Persea Mite Trial-Donlon Ranch, Somis, CA

Treatment/Material	Rate/Acre	Average Mites/Leaf** per Sample Date				
		8/17*	8/28	8/31	9/7	9/14
(1) Water Silwet L-77	200 gal. 6 oz. fl./100	7.84 <sub>NS</sub>	3.00 <sub>A</sub>	3.08 <sub>B</sub>	4.95 <sub>A</sub>	1.51 <sub>A</sub>
(2) NR 435 oil Terminator	36.7 gal. 8.4 gal.	7.59	0.09 <sub>B</sub>	0.27 <sub>C</sub>	0.17 <sub>B</sub>	0.39 <sub>B</sub>
(3) Organic Solutions Silwet L-77	6# 6 oz. fl/100	7.67	2.35 <sub>A</sub>	5.35 <sub>A</sub>	7.03 <sub>A</sub>	2.76 <sub>A</sub>
(4) Omite 30W	10#	7.89	0.65 <sub>B</sub>	0.24 <sub>C</sub>	0.27 <sub>B</sub>	0.32 <sub>B</sub>
(5) NR435 oil	36.7 gal.	7.85	0.29 <sub>B</sub>	0.41 <sub>C</sub>	0.32 <sub>B</sub>	0.84 <sub>B</sub>

\*Pre-Treatment count, treatments applied 10/13/95.

\*\*Means = number persea mite adults/25% leaf area on a total of 5 leaves per tree as an average of 15 single tree replicates per treatment. Means not showing a common letter are significantly different at  $p = 0.05$  using ANOVA and Duncan's LSD test.

NOTE: Statistical analysis was performed on  $\log(n+1)$  transformed data.

All materials pre-mixed as slurry, then added to 3/4 gallon of water in spray tank of a 2½ gal. Solo backpack sprayer. Applications were made at 10-15 psi, mist spray, using a t-jet 8002VS nozzle (80 degree spray, 2 gal/min).