(D2)

ALMOND: *Prunus dulcis* (Miller) D. A. Webb

PACIFIC SPIDER MITE CONTROL IN ALMOND, 2005

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Pacific spider mite: *Tetranychus pacificus* McGregor

The year 2005 was recognized as one of the worst mite years in recent history for spider mites in almonds in the lower San Joaquin Valley, CA. Defoliation of almond orchards by spider mites was a widespread phenomenon across many locations farmed by many growers. This experiment was conducted during the late summer during 2005 in a 1-yr-old commercial block of almonds located in western Kern County, CA. We did a visual survey of trees in an area of approximately 2 acres and chose the 85 most heavily-infested trees. These trees were randomly assigned to one of five replicates each of 14 miticides with or without oil, oil alone, a water check, and an untreated check. Miticides were applied on 12 Aug 2005 with a CO_2 powered backpack sprayer. Some treatments included 1% 415 narrow range petroleum oil. Applications were made at 30 psi using an 8002 fan jet nozzle. The spray solution was prepared by mixing the miticides to a 200 gpa dilution and then spraying each individual tree with 500 ml of that solution, providing coverage that ranged from good coverage (leaf surface completely or close to completely damp) to slight runoff. At the time of application it was > 100°F, the leaves were hardened off and dusty, and there was a large amount of spider mite webbing covering many of the leaves. Mite populations were evaluated one day prior to treatment on 11 Aug and then again 3 DAT (15 Aug), 7 DAT (19 Aug), 14 DAT (26 Aug), and 21 DAT (2 Sep). On each evaluation date, 10 leaves were randomly collected from each tree. Leaves were placed into small paper bags, placed in a cooler, and evaluated under a scope in the lab for the total number of Pacific spider mite eggs and motiles (juveniles + adults). Mean no. motiles and eggs/leaf were calculated for each treatment. These data were transformed using squareroot (x) and analyzed by ANOVA with means separated by Fisher's Protected LSD at $P \leq 0.05$. Data are presented as untransformed means.

Under these sub-optimal conditions of heavy mite pressure with hardened off, webbed over leaves under temperature conditions over 100°F., several newer miticides, including Kanemite, Zeal, Envidor + Oil, both rates of Onager, Fujimite, and Acramite controlled Pacific mite well. The least effective of the miticides were the two abamectin products (Agri-Mek and A-8612), which are best known for their effectiveness prior to when leaves harden off.

Table 1 shows the effects of miticide treatments on the number of motile spider mites per leaf. There were no significant differences in pre-treatment counts. At 3 DAT, Acramite, Envidor + oil, Fujimite, Kanemite and Zeal had mite densities significantly lower than the untreated check. At 7 DAT, all treatments (except for water alone) resulted in significant reductions in mite density. The lowest densities of mites were in plots treated with Acramite, Envidor + oil, Kanemite, Onager 16 or 24 fl oz, and Zeal. At 14 DAT, the lowest mite densities (< 1 mite/leaf) were achieved by Envidor + Oil, Kanemite, Omite, the high rate of Onager, and Zeal. The two abamectin treatments (Agri-Mek + Oil and A-8612) were both statistically the same as the untreated check. At 21 DAT, the densities of spider mites in all treated plots were not statistically different than the untreated check (7.4). Table 2 shows the effects of miticide treatments on the number of spider mite eggs per treatment. There were no significant differences in pre-treatment numbers of eggs or in data 3 DAT. Despite their lack of significance, however, the two best treatments 3 DAT (Kanemite and Envidor + Oil) also had the lowest number of motile mites on this same evaluation date. At 7 DAT, statistically significant reductions were achieved by Acramite, Desperado, Envidor + oil, Kanemite, Onager 16 or 24 fl oz, and Zeal compared to the water control. At 14, and 21 DAT the numbers of mites per leaf declined and there were no longer significant differences in the densities of spider mite eggs between treatments.

Table 1.

Treatment/ formulation	Rate amt product/acre	Mean no. motile (juvenile + adult) mites /leaf				
		Pre	3 DAT	7 DAT	14 DAT	21 DAT
Acramite 50WS	1 lb	80.1a	9.9abc	3.3a	4.3abcd	0.6a
Acramite 50WS[a]	1 lb	93.8a	22.0abcd	3.4ab	3.6abcd	0.1a
Agri-Mek 0.15EC[a]	10 fl oz	28.2a	24.8bcd	24.2cd	9.9ef	4.9a
A-8612 0.15EC[a]	10 fl oz	29.5a	26.1abcd	10.3abc	6.4def	5.7a
Desperado 54AS	1 gal	71.4a	16.5abcd	5.6abc	4.6abcde	1.7a
Envidor 240SC	18 fl oz	66.8a	34.3d	5.3abc	2.7abcde	3.4a
Envidor 240SC[a]	18 fl oz	60.2a	7.6abc	0.9a	0.6abcd	0.5a
Fujimite 5EC	2 pt	43.6a	5.8ab	7.1abc	2.4abcd	1.4a
Kanemite 15SC	31 fl oz	36.7a	3.6a	2.9a	0.2ab	0.5a
Omite 30WS	8 lb	89.8a	21.6abcd	11.8abcd	0.5abc	1.2a
Onager 11.8EC	16 fl oz	82.4a	37.7d	1.9a	2.2abcd	0.1a
Onager 11.8EC	24 fl oz	32.1a	25.2abcd	3.6a	0.1a	0.3a
Vendex 50WP	2.5 lb	76.4a	23.4cd	8.4abcd	1.4abcd	0.3a
Zeal 72WDG	3 oz	60.8a	3.9abc	0.8a	0.2ab	0.2a
NR-415 Oil	2%	51.3a	16.6abcd	19.5bcd	5.1abcde	7.3a
Water check	--	65.7a	37.8d	25.5e	2.6abcd	3.9
Untreated check	--	96.2a	39.0d	60.9e	16.3f	7.4a

Means in a column followed by the same letter are not significantly different ($P > 0.5$, Fisher's protected LSD) after square root (x + 0.5) transformation of the data. Data are reported as original numbers.
[a]Included NR-415 Oil at 1% v/v.

Table 2.

Treatment/ formulation	Rate amt product/acre	Mean no. eggs per leaf				
		Pre	3 DAT	7 DAT	14 DAT	21 DAT
Acramite 50WS	1 lb	31.7a	6.0a	1.5a	4.3a	1.3a
Acramite 50WS[a]	1 lb	48.4a	8.0a	2.4abcd	2.4a	0.1a
Agri-Mek 0.15EC[a]	10 fl oz	18.1a	3.8a	8.4abcd	7.6a	1.2a
A-8612 0.15EC[a]	10 fl oz	10.9a	6.9a	3.9abcd	6.7a	5.2a
Desperado 54AS	1 gal	27.0a	3.3a	1.5ab	7.7a	0.5a
Envidor 240SC	18 fl oz	17.1a	5.9a	2.4abcd	2.7a	2.8a
Envidor 240SC[a]	18 fl oz	17.2a	1.7a	0.4a	0.6a	1.4a
Fujimite 5EC	2 pt	36.6a	2.7a	5.6abcd	0.8a	1.1a
Kanemite 15SC	31 fl oz	15.4a	0.4a	0.2a	0.3a	2.0a
Omite 30WS	8 lb	24.5a	10.6a	4.8abcd	0.1a	2.3a
Onager 11.8EC	16 fl oz	57.6a	12.7a	0.5a	1.6a	0.0a
Onager 11.8EC	24 fl oz	16.0a	9.4a	1.8ab	0.2a	0.3a
Vendex 50WP	2.5 lb	47.2a	4.3a	4.2abcd	1.2a	0.1a
Zeal 72WDG	3 oz	27.0a	4.2a	1.4ab	0.2a	0.2a
NR-415 Oil	2%	15.7a	3.0a	12.2de	2.6a	0.8a
Water check	--	35.2a	13.2a	12.3cde	1.7a	1.6a
Untreated check	--	27.1a	14.6a	26.8e	5.4a	7.6a

Means in a column followed by the same letter are not significantly different ($P > 0.5$, Fisher's protected LSD) after square root (x + 0.5) transformation of the data. Data are reported as original numbers.
[a]Included NR-415 Oil at 1% v/v.