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Section D: Citrus, Nuts, and Other Tree Fruits

The Effects of Miticide Treatments on Pacific Spider Mite in Almond, 2017

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Almond | *Prunus dulcis*

Pacific spider mite: *Tetranychus pacificus* McGregor

During 2017, we conducted a trial in Shafter, CA to evaluate the effects of miticides on the density of Pacific spider mites in almond. The trial was located in a 9-yr-old orchard (20 ft × 22 ft spacing) that contained alternating rows of the varieties Nonpareil and Monterey. Plot size was three trees long by one row wide with two reps in Nonpariel and two reps Monterey. The plots were organized into a randomized complete block design with 4 blocks of 12 treatments and one untreated check. Treatments were applied on 8–9 Aug to individual trees with a hand gun at 150 psi with a water volume of 200 gpa. All treatments included 1% 415 Oil. Mite densities were evaluated in each plot prior to treatment on 8 Aug and then on 11 Aug (3 DAT), 16 Aug (8 DAT), 22 Aug (14 DAT), and 29 Jul (21 DAT). On each sampling date, a total of 20 leaves were collected per plot. This included six to seven random leaves per tree from each of the three trees per plot. Leaves were transported to a laboratory where mites were counted and converted to average mites per leaf. The number of cumulative mite-days for each plot was calculated by multiplying the number of mites at 3 DAT by 3 d, then for the other evaluation dates calculating the average mites per leaf for the current and previous sample date and multiplying by the number of days between evaluations, and then calculating the sum of the mite-days from all evaluation dates. Data were analyzed by ANOVA using transformed data (square root [x + 0.05]) with means separated by Fisher's Protected LSD ($P \leq 0.05$).

There were no significant differences in mite density prior to treatment, 3 DAT or 8 DAT. By 14 DAT, all treatments significantly reduced mite densities compared to the untreated check (Table 1). The lowest mite densities 14 DAT were in plots treated with bifenazate (Banter, Vigilant) and Nealta, though these treatments were statistically equivalent to all other treatments except for Onager Optek. By 21 DAT populations of sixspotted thrips entered the orchard and reduced mite populations in all plots to 0.2 or less per leaf. Data on cumulative mite-days across all evaluation dates showed significant reductions in mite density in plots treated with bifenazate (Banter, Vigilant), the METI inhibitors (Nealta, Fujimite and Magister) and the growth regulator Envidor. Mite densities in plots treated with Biomite, Kanemite, and 1180AA were statistically equivalent to the best treatments as well as the untreated check.

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Table 1.

Treatment/formulation[a]	Rate form prod/ acre	Mean spider mites per leaf					
		Precounts	3DAT	8DAT	14DAT	21DAT	Mite-days[b]
Banter SC	16 fl oz	3.3a	0.6a	0.2a	0.2ab	0.0a	5.1ab
Banter SC	24 fl oz	3.0a	0.4a	0.3a	0.1a	0.0a	3.9a
Biomite	0.59gal/A	3.6a	1.2a	0.8a	0.2ab	0.0a	10.3abcde
Envidor 2SC	18 fl oz	8.0a	1.0a	0.7a	0.4ab	0.0a	10.2abcd
Fujimite SC	32 fl oz	1.2a	0.4a	0.2a	0.5ab	0.1a	6.2abc
Kanemite 15SC	31 fl oz	8.0a	1.6a	0.5a	0.2ab	0.1a	11.4abcde
l180AA	20.5 fl oz	3.8a	1.8a	1.3a	0.4ab	0.1a	16.4bcde
Magister SC	32 oz	3.9a	0.4a	0.4a	0.5ab	0.0a	7.0abcd
Nealta 20SC	13.7 oz	2.3a	0.1a	0.3a	0.2a	0.0a	3.4a
Onager Optek	24 oz	6.5a	3.0a	1.4a	1.0b	0.1a	26.0de
Vigilant 4SC	24 fl oz	4.1a	0.3a	0.1a	0.2a	0.0a	2.8a
415 Oil	1%	8.1a	2.0a	1.7a	0.4ab	0.2a	19.6cde
Untreated Check	-	3.6a	2.1a	0.9a	1.9c	0.0a	26.2e
	F	1.01	1.44	1.79	2.89	0.98	2.48
	P	0.4596	0.1924	0.0876	0.0068	0.4842	0.0177

Means in a column followed by the same letter are not significantly different, $P = 0.05$ FPLSD, after square root (x + 0.5) transformation of the data. Untransformed means are shown.

[a]All treatments had 1% 415 oil as a surfactant except 415 Oil.

[b]Mite-days is a cumulative measurement that is determined by adding the average mites per leaf for each of the 21 d of the trial.