

The Effects of Miticide Treatments on Pacific Spider Mite in Almond, 2018

David Haviland¹ and Stephanie Rill

University of California Cooperative Extension, Kern County, 1031 S. Mt. Vernon Ave., Bakersfield, CA 93307 (Phone: (661) 862-6200, Fax: (661) 862-6208, dhaviland@ucdavis.edu; smrill@ucanr.edu) and ¹Corresponding author, e-mail: dhaviland@ucdavis.edu

Subject Editor: Jonathan Babcock

Almond | *Prunus dulcis*

Pacific spider mite: *Tetranychus pacificus* McGregor

During 2018, 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 Nonpareil and two reps in Monterey. The plots were organized into a randomized complete block design with 4 blocks of 16 treatments. Treatments includes 12 miticides plus 1% 415 oil, plots with 415 oil alone, a water only check, and 2 untreated checks. Treatments were applied on 26 Jul to individual trees with a hand gun at 150 PSI with a water volume of 200 gpa. Approximately 2 wk prior to the initiation of the trial, the entire orchard was sprayed with esfenvalerate (Asana) in an attempt to minimize predation of spider mites by sixspotted thrips. Mite densities were evaluated in each plot prior to treatment on 25 Jul and then on 30 Jul (4 DAT), 2 Aug (7 DAT), 9 Aug (14 DAT), 16 Aug (21 DAT), 22 Aug (27 DAT), and 29 Aug (33 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 4 DAT by 4 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 precounts that ranged from 0.0 to 1.73 mites per leaf (Table 1). There were no significant differences among treatments 4, 7, and 14 DAT due to relatively low mite densities throughout the orchard as a result of biological control, despite the fact that mite densities were numerically lower in all treatments than the water or untreated checks 14 DAT. By 21 DAT, all treatments significantly reduced mite densities compared to the water check, but were not significantly different than either of the untreated checks. By 27 DAT, mite densities in the checks increased to 0.36–0.54 mites per leaf. On that date, the best treatments were Banter, Envidor, Fujimite, Nealta, Onager Optek, Vigilant, TetraCURB, Biomite, and Magister. Treatments that were significantly better than both of the untreated checks included the low rate of Banter, Envidor, Fujimite, Nealta, Onager, and Vigilant. All miticides except for Cinnerate, Kanemite, and Magister were significantly better than at least one of the untreated checks. By 33 DAT sixspotted thrips overtook the trial and reduced mite densities to less than 0.31 per leaf in all plots with no differences among any treatments ($P = 0.26$). When spider mite data across all evaluation dates were combined as cumulative mite days, all miticides resulted in significant reductions in mite density compared to the water check and untreated check 1. Mite densities in all miticide treatments except Envidor were numerically lower than, but statistically equivalent to, the second untreated check.

This research was funded by the Almond Board of California with industry gifts of funding and product.

Table 1.

Treatment/formulation ^a	Rate form prod/acre	Mean spider mites per leaf							Mite-days ^b
		Precounts	4 DAT	7 DAT	14 DAT	21 DAT	27 DAT	33 DAT	
Banter SC	16 fl oz	0.00	0.00	0.00	0.00	0.05ab	0.01a	0.03	0.5ab
Banter SC	24 fl oz	0.43	0.00	0.00	0.04	0.00a	0.13abcde	0.15	1.5ab
Biomite	0.59 gal	0.05	0.00	0.25	0.00	0.01ab	0.10abcd	0.18	2.5ab
Cinnerate	50 fl oz	0.10	0.23	0.00	0.00	0.03ab	0.51ef	0.03	4.6abc
Envidor 2SC	34 fl oz	0.03	0.00	0.00	0.00	0.00a	0.03ab	0.04	0.3a
Fujimite SC	32 fl oz	0.03	0.00	0.00	0.04	0.01ab	0.05ab	0.03	0.7ab
Kanemite 15SC	31 fl oz	0.00	0.01	0.01	0.01	0.00a	0.52def	0.00	3.3ab
Magister SC	32 fl oz	0.05	0.01	0.00	0.13	0.00a	0.14abcdef	0.04	1.9ab
Nealta 20SC	13.7 fl oz	0.03	0.00	0.00	0.06	0.00a	0.03ab	0.13	1.0ab
Onager Optek	24 fl oz	0.18	0.03	0.04	0.00	0.00a	0.04ab	0.19	1.1ab
TetraCURB Concentrate	96 fl oz	1.73	0.20	0.06	0.03	0.08ab	0.08abc	0.08	2.8ab
Vigilant 4SC	24 fl oz	0.05	0.00	0.00	0.00	0.00a	0.04ab	0.03	0.3ab
415 Oil	1% V/V	0.05	0.00	0.50	0.08	0.00a	0.28bcdef	0.10	5.0abc
Water		0.03	0.03	0.95	1.98	0.22c	0.36bcdef	0.24	23.0c
UTC 1	-	1.08	1.58	0.64	0.31	0.09abc	0.54f	0.31	18.8c
UTC 2	-	0.00	0.00	0.00	0.46	0.13bc	0.44cdef	0.14	7.1bc
	<i>F</i>	0.81	1.01	0.96	0.96	1.95	2.18	1.28	1.91
	<i>P</i>	0.6648	0.4649	0.5087	0.5097	0.0433	0.0224	0.2567	0.0478

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.

^aAll treatments had 1% 415 oil as a surfactant except 415 Oil, Water Check and Untreated Checks.

^bMite-days is a cumulative measurement that is determined by adding the average mites per leaf for each of the 33 d of the trial.