

SOUTHERN FIRE ANT CONTROL IN NON-BEARING ALMOND, 2014

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Southern Fire Ant: *Solenopsis xyloni* (McCook)

During 2014 we conducted a trial near Shafter, CA to evaluate the effects of three insecticidal ant baits on the density of southern fire ants in almonds. The trial was located in a 45-acre portion of a second-leaf orchard that contains alternating rows of the varieties nonpareil and monterey. Each plot was 15 rows wide by 15 trees long (2.3 ac.) on a 20 ft by 22 ft spacing. The plots were organized into a randomized complete block design with four blocks of three treatments and an untreated check. The treatments were 1) Altrevin at a rate of 1.5 lbs/ac, 2) Clinch at a rate of 1.0 lb/ac, 3) Seduce at a rate of 34.0 lb/ac and 4) an untreated check. Applications were made using a Herd Spreader GT77 mounted to the back of an all-terrain vehicle (ATV) with a 0.576" diameter hole within plate for Seduce applications and a #2 plate for Altrevin and Clinch applications on 27 Jun.

Southern fire ant densities were evaluated in each plot prior to treatment on 26 Jun and then on 30 Jun (4DAT), 3 Jul (7DAT), 7 Jul (11DAT), 10 Jul (2 WAT) and then weekly starting 17 Jul through 5 Sept (10 WAT). On each sample date, 24 plastic vials baited with 0.5 inch slices of hot dog were placed next to the irrigation hose in rows 5, 7, 9, and 11 starting at tree 3 and going every other tree until tree 13. After 1.5 hrs to 3 hrs, depending on environmental conditions on the evaluation date, vials were picked up, sealed closed and placed in a freezer. Vials of frozen ants were removed from the freezer at a future date and were evaluated for the number of ants in each vial. Data were organized for each plot to determine the average number of ants per vial. Data was analyzed by ANOVA after square root ($\sqrt{x+0.5}$) transformation of the data. Means for all data were separated using Fisher's Protected LSD at $P = 0.05$.

The orchard contained large populations of southern fire ants that were fairly evenly distributed throughout the trial. In precounts the average number of ants per vial ranged from 375 to 451 for the four treatments. Following treatment ant populations in plots treated with Altrevin were immediately reduced by 87 to 89% on evaluations 4 and 7 DAT. Ant density remained significantly reduced by 50 to 77% compared to the untreated check through 7 WAT. From 8 to 10 WAT ant densities were reduced by 28 to 44% to levels that were not significantly different than the untreated check. In plots treated with Clinch there was a short-lived drop-off in ant foraging 4 DAT suggesting some contact mortality of foraging ants may have occurred. By 7 DAT foragers returned and ant density was only 8% lower than the untreated check. From 11 DAT through 10 WAT there was a steady increase in ant control with percentage reductions compared to the untreated check starting out at 28% (9 DAT) and increasing to 76% (9 WAT). It is possible that the greatest level of ant suppression with Clinch could have been achieved after

the end of the trial when you consider that the greatest level of ant suppression was in the final evaluation date with a continued upward trend in control each week prior to that date. In plots treated with Seduce there were significant reductions in ant density of 51 and 47% compared to the untreated check 4 DAT and 7 DAT, respectively. For all other evaluation dates there were no significant differences compared to the untreated check. On those dates percentage reduction ranged from 6 to 22%, which is almost equivalent to the 17% lower populations that were present in these plots compared to the untreated check in the precounts.

Table 1. The effects of ant bait applications on the density of southern fire ant workers collected in hot dog bait stations.

Evaluation date		Treatment, rate/acre				F	P
		Altrevin 1.5 lb	Clinch 1.0 lb	Seduce 34 lb	Untreated Check		
		Average No. of ants per vial					
26-Jun	Precount	389	379	375	451	1.29	0.335
30-Jun	4 DAT	47.7a	243b	232b	470c	21.39	0.0002
3-Jul	7 DAT	43a	309bc	178b	337c	14.96	0.0008
7-Jul	11 DAT	126a	296b	323b	416b	13.13	0.0012
10-Jul	2 WAT	60a	173b	218b	272b	12.39	0.0015
17-Jul	3 WAT	88a	206b	250bc	321c	24.5	0.0001
24-Jul	4 WAT	70a	145ab	196b	247b	4.64	0.0318
31-Jul	5 WAT	168a	148a	268b	345b	8.57	0.0053
8-Aug	6 WAT	156a	110a	270b	310b	5.96	0.016
14-Aug	7 WAT	82a	60a	195b	207b	18.52	0.0003
21-Aug	8 WAT	145b	58a	176b	225b	6.4	0.013
29-Aug	9 WAT	156b	61a	263c	281c	36.19	<0.0001
5-Sep	10 WAT	168b	55a	206b	234b	16.54	0.0005

Means in a row followed by the same letter are not significantly different ($P > 0.05$, Fisher's protected LSD) with square root ($x + 0.5$). Untransformed means are shown.

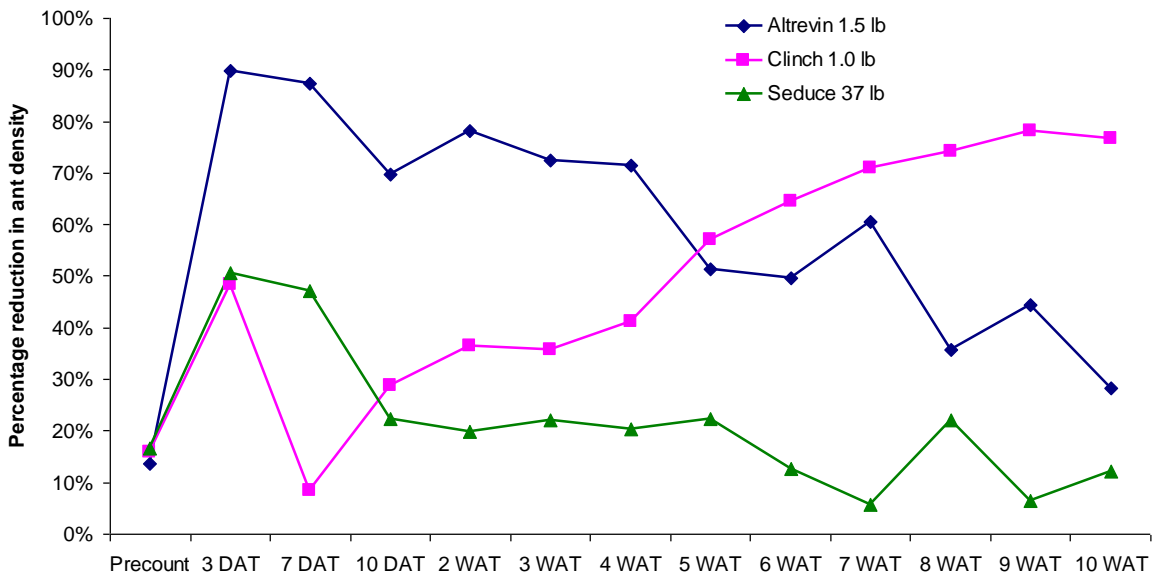


Figure 1. Percentage reductions in the density of foraging southern fire ant following applications of ant baits, Shafter, 2014.