Greenberg, L., M. K. Rust, and J. H. Klotz. 2006. Metaflumizone trials against red imported fire ants in California using corn chips as an estimate of ant abundance. Annual Red Imported Fire Ant Conference, Mobile, AL, March 28-30, 2006, pp. 34-37.

Metaflumizone, which is in a new class of pesticides from BASF called semicarbazones, was formally introduced in 2005. It is an EPA reduced risk candidate, and impacts the insect's neurological sodium channel to produce "relaxed paralysis" in insects. Due to its rapid effects, we undertook trials of this compound in Calfornia so as to have the product available for fire ant control. We did trials at Lake Elsinore and Coachella, both in Riverside County.

I. Lake Elsinore

There was a RIFA infestation in a new urban development of Lake Elsinore. The ants were living in irrigated turf next to a sidewalk and on a heavily vegetated adjacent slope on the other side of the sidewalk. Although exit holes could be seen in these areas, mounds were not generally visible. We therefore decided to use foraging activity as an estimate of ant abundance. We have used Lays corn chips at other locations as a fire ant bait, and have found it to be a quick and easy way to monitor ant numbers. A corn chip is placed in a 7 dram plastic vial, which is placed horizontally on the ground. After 1.5 hrs the vial is capped and the ants are brought back to the laboratory where they are counted. We set up 14 plots at this location, each 130 x 26 ft. We used 3 formulations of metaflumizone, plus Amdro and 2 control plots. All treatments consisted of defatted corn grit ant baits that were spread at 1.5 lbs/acre. Within each plot, ant numbers were monitored at the centers of the turf area by putting down 6 vials with a corn chip at 10 ft intervals.

Fig. 1 and Table 1 show the results of these trials. For this report the metaflumizone trials have been combined. At 7 and 14 days the metaflumizone gave higher reductions in ant numbers than the Amdro. One year post-treatment ant numbers had almost returned to their pretreatment values.

II. City of Coachella

In this city there was a RIFA infestation at a date palm grove. Ants were living near the bases of the trees, but in many areas there was too much debris on the ground to see mounds. There was also a population of ground squirrels living near the trees, and they removed corn chips that we placed on the ground. We therefore devised a bait station consisting of a small plastic cup (3 in diam x 1.5 in h). We cut out the centers of the plastic lids of these cups and attached to the rims ¼ inch mesh metal screening. This screen allowed ants to enter the cup, but prevented animals from removing the chips. We made a small excavation on the ground in which the cup and its wire lid were place horizontally with the opening flush with the ground (Fig. 2). After 1.5 hrs the wire lid was replaced with a plastic lid, and the chip and ants were brought back to the laboratory for counting.

Plots consisted of a 3x3 block of trees. The center tree in each plot was monitored by putting out a cup containing a corn chip at 90 degree intervals 2 m out from the base of the tree. Thus, there were 4 monitors for each plot. In treatment plots the entire 9 tree plot was treated with one of the ant baits. There were 2 control plots that were untreated. Fig. 3 shows a plot of the results of these trials. Table 2 shows differences from pre-treatment values for each of the

treatments; only the metaflumizone/corn grit bait was still significant after 154 days. Fig. 4 shows the grand means for all post-treatment data over the entire experiment. The best result was obtained with the metaflumizone/corn grit, followed by the metaflumizone/Tast-E-Bait and the Amdro. Table 3 shows the pairwise comparisons of these grand means. In conclusion, the metaflumizone compared favorably with the Amdro, acting more quickly and with better results overall.

Days post-treatment	7	14	29	58
Amdro	85	79	93	100
Metaflumizone	95	99	95	88
Control	-60	69	52	94

Table1. Percent reductions in ant numbers from pre-treatment values at Lake Elsinore. A negative number means that ant numbers increased.

Days post-treatment	7	35	77	112	154
Amdro	**	**	*	ns	ns
Metaflumizone on corn grit	*	*	*	*	*
Metaflumizone on Tast-E-Bait	**	**	**	**	ns
Control	*	*	ns	ns	ns

Table 2. Wilcoxon signed rank test comparison of pre- and post-treatment ant numbers. * = $P < 0.05$; ** = $P < 0.01$; ns = not significant.

	Control	Amdro	Tast-E-Bait	Corn grit
Control	--			
Amdro	ns	--		
Tast-E-Bait	*	ns	--	
Corn grit	***	**	*	--

Table 3. Pair-wise comparison of grand means of all post-treatment data (see Fig. 4). * = $P < 0.05$; ** = $P < 0.01$; *** = $P < 0.001$; ns = not significant. “Corn grit” = metaflumizone on corn grit; “Tast-E-Bait” = metaflumizone on Tast-E-Bait.

Figure 1. Average numbers of ants on corn chips at Lake Elsinore trials.

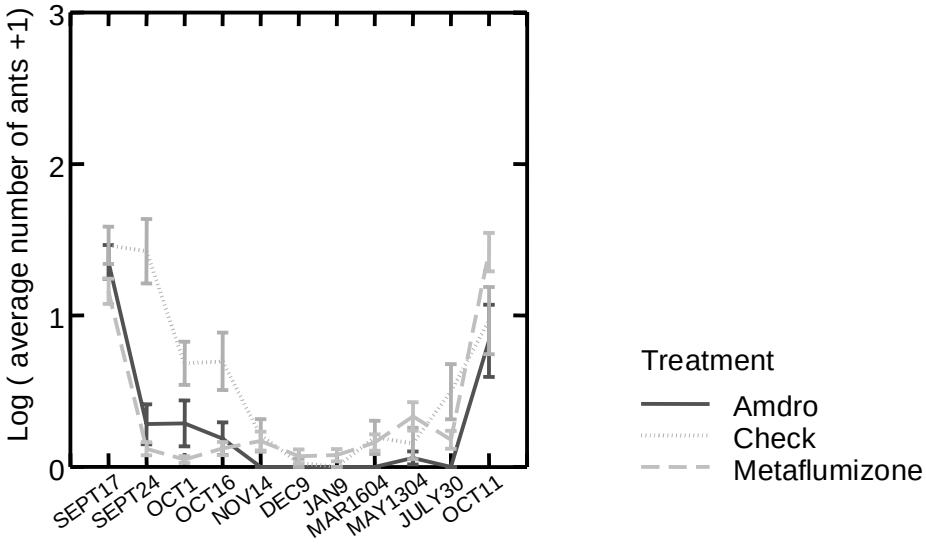

Fig. 2. Corn chip inside of plastic cup in small depression on ground.

Fig. 3. Average numbers of ants on corn chips in city of Coachella. “Corn grit” = metaflumizone on corn grit; “Tast-E-Bait” = metaflumizone on Tast-E-Bait.

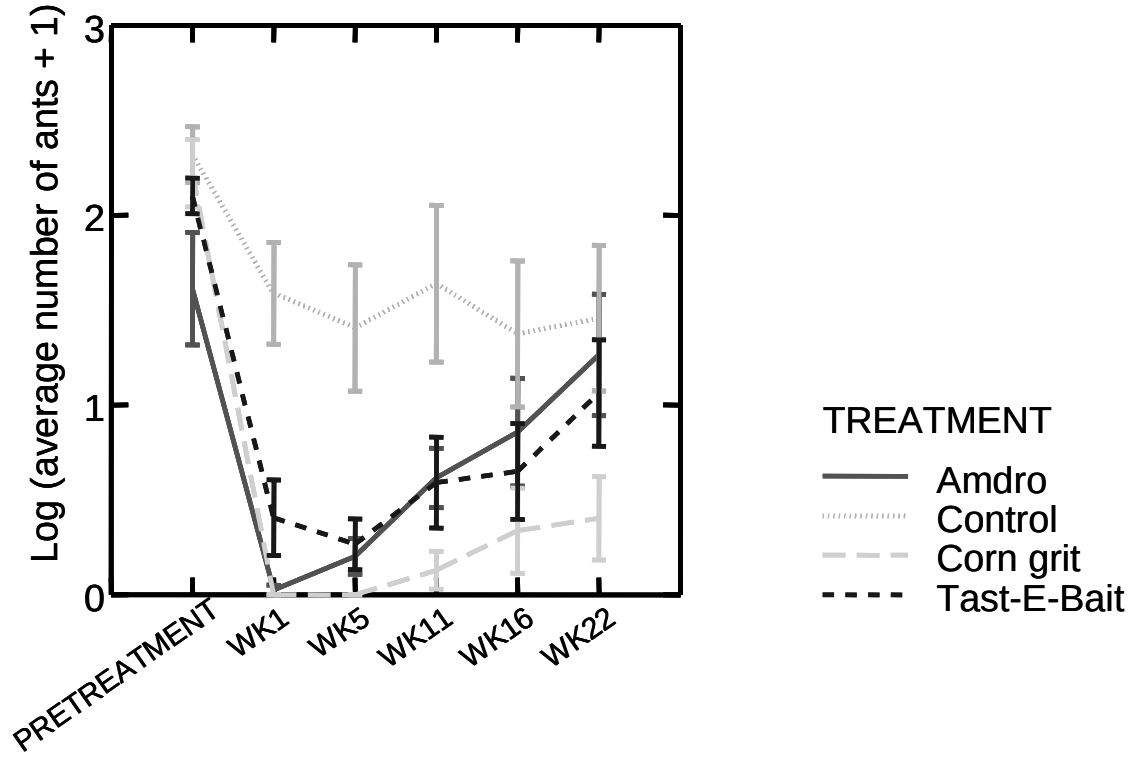

Figure 4. Grand means of all post-treatment data. Means are based on average number of ants on corn chips. Log transformation used to normalize data. “Corn grit” = metaflumizone on corn grit; “Tast-E-Bait” = metaflumizone on Tast-E-Bait.