

**Logic<sup>®</sup> Plus Fertilizer Blends and Alternative Coverage Application Test  
Granger Lake, Williamson Co., Texas - 1997-98**

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Some ranchers in Texas have been known to mix Logic<sup>®</sup> fire ant bait with dry fertilizer to reduce the need for buying a specialized bait spreader and eliminate an additional pass over a field specifically for fire ant control. Though this practice certainly reduces immediate costs for the rancher, there is evidence that mixing soybean oil-formulated fire ant bait with fertilizer quickly reduces the attractiveness of the bait to fire ants resulting in less or no control. This test was designed to simulate actual field use of fertilizer and Logic<sup>®</sup> (1.0% fenoxycarb) application rates and equipment as closely as possible. Therefore, plot size was set at three acres to increase application realism, but at the cost of replications, which may have yielded better statistical data.

**Materials and Methods**

Seven three-acre rectangular plots (450 ft. x 300 ft.) were established along the earthen dam of Granger Lake, Williamson Co., TX on 15 October 1997. Turn rows of 50 ft. width were left between all plots to minimize overlapping of broadcast treatments and “bleeding” of Logic effects between plots. Each plot was randomly assigned one of the following seven treatments:

<u>Treatment name</u>	<u>Fertilizer</u>	<u>Logic<sup>®</sup> /acre rate</u>	<u>Equipment</u>	<u>Coverage, swath</u>
untreated control	-	-	-	-
Logic	none	1.5 lb.	Herd seeder	full, 35 ft. center
Logic Skip	none	1.5 lb.	Herd seeder	skip, 50 ft. center
Logic Low Rate Skip	none	1.0 lb.	Herd seeder	skip, 50 ft. center
Logic + Fertilizer Mix	dry granular	1.5 lb.	PTO fert. cart	full, 60 ft. center
Logic + Fertilizer Tandem	dry granular	1.5 lb.	Herd seeder on fert. cart	50 ft. center (full fert., skip Logic)
Logic + Liquid Fert. Tandem	liquid	1.5 lb.	Herd seeder, 40 ft. boom cart	40 ft. center (full fert., semi-skip Logic)

Treatments were applied on 21 October 1997 from approximately 10:30 a.m. - 3:00 p.m. Weather conditions were warm, partly cloudy, calm and dry in the morning, turning cooler, windy and mostly cloudy in the afternoon. A brief rain occurred around 1:00, but was barely enough to wet the ground. Dry fertilizer was applied using a Terra, twin fan, PTO powered, pull-behind cart with a swath width of approximately 60 feet. Liquid fertilizer was applied using a ground-powered, pull behind cart with a 40-foot boom. Logic was applied using a Herd GT-77 electric seeder with a fixed gate, modified and mounted on the fertilizer cart by Mr. David Herd of Herd Seeder Co.

Inc. Treatments applied as “tandem” were accomplished using the Herd Seeder and fertilizer spreader simultaneously, but with no intentional blending or mixing of the two materials.

Evaluations were conducted by counting all the active mounds in 30 ft. wide transects running 300 ft. across the plots (0.21 ac.). Four, randomly placed transect counts were made for each plot on 21 November 1997 and 4 February 1998. Because of the slow-acting nature of Logic, the first evaluation was considered a pre-count. Active mound numbers in an adjoining test of a faster-acting fire ant product actually increased during this time period due to rainfall and more moderate temperatures.

Two statistical tests were conducted to better analyze data. Duncan’s multiple range test was used to better separate the subtle differences that appeared in the data. Tukey’s studentized range test was used to reduce Type I error. Only Tukey’s was performed on the five-month data.

## Results

Mean no. active mounds (in 4 random 0.21 ac. transects) per plot

Treatment	Pre-count	15 weeks	change vs pre	5 months
Untreated	19.75 abc/ab	20.25 a/a	2.5%	14.25 a (Tukey)
Full Logic	15.50 bc/ab	7.25 b/b	- 53.2%	5.25 b
Logic Skip	22.00 ab/ab	8.75 b/ab	- 60.2%	6.75 b
Logic Low-rate Skip	13.25 c/b	9.00 b/ab	- 32.1%	8.50 ab
Logic+Fert Mixed	22.00 ab/ab	14.00 ab/ab	- 36.4%	8.25 ab
Logic+Fert Tandem	25.25 a/a	18.25 a/ab	- 27.8%	15.50 a
Logic+Liquid Fert	14.50 c/b	16.00 ab/ab	10.3%	8.75 ab
F	3.84	3.50	-	5.77
P	0.0096	0.0147	-	0.0011
R <sup>2</sup>	0.5235	0.5002	-	0.6223

Data analyzed using PC SAS ANOVA procedures. Means in the same column with different letters are significantly different ( $P < 0.05$ ) using Duncan’s multiple range test/Tukey’s studentized range test.

## Discussion

Given the mild, wet weather that the test site received after treatments were applied, it was unlikely that Logic treatments reached their level of maximum suppression by early February. However, there appear to be some strong trends emerging. The number of active mounds in the untreated plot stayed very constant, despite the use of randomly placed transects for evaluations. Full coverage, full rate Logic and skip swath, full-rate Logic resulted in a greater than 50% reduction in mound numbers that were significantly ( $P < 0.05$ ) lower than mound numbers in the untreated plot. These results are consistent with those from past trials on this and other sites with

similar treatments. It would be expected that active mound counts would continue to decline into the 80-95% control range.

The low-rate skip-swath and two dry fertilizer treatments had numerically lower rates of control than the conventional and skip swath applications without fertilizer, but the differences were not statistically significant ( $P < 0.05$ ). Results may be indicative of not enough viable product reaching all the colonies to affect them. The reasons could be several-fold. Laboratory preference tests performed in conjunction with this test and on other, similarly-formulated products suggest that fertilizer quickly reduces the attractiveness of soybean oil formulated baits. Though this would account for the lower performance of the bait mixed with fertilizer, it would not account for the low-rate skip-swath or the tandem application. These two treatments were applied later in the day after a cold front passed through the area. Since both baits were applied on 50 ft. centers, as was the conventional skip swath, it could be assumed that the cooler weather reduced ant foraging on what might have been a threshold level of Logic, resulting in an insufficient dose to some colonies.

The Logic applied in tandem with liquid fertilizer actually saw a 10% increase in mound numbers, possibly indicating that bait granules in contact with liquid fertilizer quickly lose their attractiveness to ants or that liquid fertilizer deters ant foraging for some time.

Results of the test are somewhat inconclusive given the fact that it was not replicated, due to the large size of the plots, and given the season and weather conditions. However, the loss of statistical rigor was at least partially offset by accurate representation of field use conditions. Application of fire ant control baits to pastures, particularly those being hayed, is encouraged in the fall for maximum mound suppression the following spring. These results reinforced the recommendation that soybean oil formulated fire ant bait NOT be mixed or over-sprayed with fertilizer, but that skip swath application of Logic at 0.75 lb/acre is a viable means of cutting costs in half while maintaining similar rates of control.