

REDUCING TREATMENT COSTS FOR FIRE ANT SUPPRESSION IN TEXAS CATTLE PRODUCTION SYSTEMS

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Treatment programs conducted to suppress populations of the red imported fire ant, *Solenopsis invicta* Buren, can be expensive and time consuming. Short of subsidizing the cost of fire ant insecticides by government programs, potential techniques for reducing treatment costs include: 1) develop economic injury levels and implementation of economic thresholds or action levels; 2) use modified treatment patterns; 3) reduce equipment requirements; 4) treat for ants while conducting other field operations such as fertilizing; and 5) adjust treatment timing to optimize residual effectiveness (i.e. fall broadcast insecticide bait applications provide suppression of fire ants during early spring months). Methods (2,3 and 4) were investigated in the trials reported below.

I. EVALUATION OF ALTERNATIVE RATES AND TREATMENT PATTERNS FOR RED IMPORTED FIRE ANT BAIT PRODUCTS, LOGIC® AND AMDRO®.

Previous studies (Drees et al. 1992; Drees et al. 1993) showed that the effects of a spot application of Logic® Fire Ant Bait (containing fenoxycarb, also sold as Award®) affect more than one fire ant mound. Broadcast application, applied as a "skip swath" pattern (0.75 lbs./acre), provided suppression of fire ant mound numbers similar to that obtained using conventional, full coverage (1.5 lbs./acre), treatment. In the trial reported in 1993, swaths were 35 ft. wide. In addition, the application of a 1.5 lbs. mixture of Amdro® Fire Ant Granules/Insecticidal Bait (hydramethylnon, 0.75 lbs. of formulation) plus Logic (0.75 lbs.) provided quick initial fire ant suppression, characteristic of the effects of an Amdro treatment, and long (over 1 year) suppression, characteristic of a Logic treatment. The trial reported here is a replication of this earlier study and included a spot treatment applied without a manual or electric seeder.

Materials and Methods

This trial was established behind the earthen dam at Granger Lake in Williamson County, Texas. This area is routinely mowed and has restricted access to U. S. Army Corps of engineers personnel, only. No livestock was grazed in this area and cut grass was not harvested for hay. Plots, 150 by 300 ft. (1.03 acres), were established with 30 ft. buffer areas. Active fire ant mounds were counted in each plot by using a 30 ft. long pole (made from 0.75 inch diameter PVC pipe reinforced internally with 0.5 inch electrical metal tubing (EMT)). This pole was carried by at least two people and walked lengthwise across 260 ft. of each plot on each side of the centerline (0.36 acre sample area). Active ant mounds were counted using the minimal disturbance method.

Mounds were disturbed with a pointed stick and considered to be active when 25 or more worker ants emerged from the mound within 30 seconds.

Resulting ant mound counts were arrayed by plot and blocked into 4 blocks (replicates) of eight treatments each. Treatments (**Table 1**) were randomly assigned within each block. Full rate broadcast and strip treatments were applied using a tractor mounted Herd® Model GT-77 seeder, July 1, 1993. Reduced rate (0.75 lb./acre) Amdro and Logic broadcast applications were applied using a hand held Cyclone® Model 1C1 seeder, July 2. Periodically after treatments (4 weeks, 3 months, 6 months, 12 months and 18 months), fire ant mounds were monitored using the technique described above. Results were analyzed using analysis of variance (ANOVA) ($P \leq 0.05$) and means were separated using Tukey's Studentized Range test.

Table 1. Treatments evaluated for red imported fire ant suppression, Granger Lake, Williamson Co., Texas, 1993.

Treatment	Pattern	Rate
1. Amdro® (hydramethylnon)	complete coverage broadcast	1.50 lbs./acre
2. Amdro® (hydramethylnon)	complete coverage broadcast	0.75 lb./acre
3. Logic® (fenoxycarb)	complete coverage broadcast	1.50 lbs./acre
4. Logic® (fenoxycarb)	complete coverage broadcast	0.75 lb./acre
5. Logic® (fenoxycarb)	skip swath broadcast	0.75 lb./acre
6. Logic® (fenoxycarb)	spot application	2 Tbsp./spot on a 30 by 30 ft. grid pattern (1.424 lbs./acre)
7. Logic® plus Amdro® (fenoxycarb plus hydramethylnon)	complete coverage broadcast	0.75 + 0.75 lb./acre
8. untreated control	---	---

Results

This site did not receive rain from 26 June 1993 until well into September. This dry weather suppressed ant mounding activity in all plots, including the untreated control plots (**Table 2**). The full Amdro and Amdro plus Logic treatments numerically reduced active ant mound numbers relative to other treatments by four weeks after treatment. However, significant differences between treatments did not occur until 3 months following treatment with all treatments except Amdro® having significantly fewer active ant mounds than untreated plots. Statistically, all Logic®-based treatments performed similarly throughout this trial. The mound numbers in Logic skip swath and spot treatment plots began to increase after 12 months and all treatments approached or exceeded pre-treatment levels after 18 months. Although results obtained from this trial were not as clear as those documented in the trial conducted at Lake Conroe Dam (Drees et al. 1993), the trends obtained from treatments remained the same.

Table 2. Number of active red imported fire ant mounds per 0.36 acre subplot and total ant mounds per treatment (for four replications) before and after treatment, Granger Lake, Williamson County, Texas, 1993.

<u>TREATMENT</u>	Mean no. active fire ant mounds/0.36 acre*					
	<u>0 week</u>	<u>4 week</u>	<u>3 month</u>	<u>6 month</u>	<u>12 month</u>	<u>18 month</u>
Untreated	57.75a	20.75a	20.00a	36.75a	50.00a	60.50a
Amdro, full rt	55.00a	7.00a	6.25abc	6.25b	24.75ab	61.50a
Amdro, half rt	56.75a	13.50a	15.5ab	25.25ab	35.25ab	74.50a
Amdro:Logic	55.00a	6.75a	1.50bc	2.00b	15.50b	49.25a
Logic, full rt	58.25a	13.50a	0.25c	2.50b	13.50b	67.25a
Logic, half rt	56.00a	17.50a	5.75abc	2.75b	14.50b	71.00a
Logic, skip	55.00a	19.75a	4.50bc	1.75b	16.75ab	61.25a
Logic, spot	54.75a	15.50a	4.25bc	1.25b	16.00ab	60.25a
<i>F</i>	29.49	4.19	4.11	4.66	2.74	0.96
<i>P</i>	0.0001	0.0028	0.0031	0.0015	0.0247	0.5003
R sq.	0.9335	0.6659	0.6620	0.6894	0.5662	0.3147
MSE	123.74	43.293	39.429	125.57	220.281	426.756
Crit. val.	4.743					
df	21					
Min. Sig. Dif.	26.383	15.605	14.843	26.577	35.201	48.995

* Means followed by the same letter(s) are not significantly different using analysis of variance and Tukey's Studentized Range Test ($P \leq 0.05$).