

II. EVALUATION OF AMDRO® (HYDRAMETHYLNON) GRANULAR INSECTICIDE AND FERTILIZER FORMULATIONS FOR SUPPRESSION OF THE RED IMPORTED FIRE ANT.

This trial examined the efficacy of three formulations of Amdro® (hydramethylnon) Insecticide Bait blended with encapsulated fertilizer. Performance of these formulations were compared to Amdro® applied alone and applied simultaneously with urea fertilizer using separate applicators mounted and operated together on one tractor. Previous efforts have shown that mixing or blending fire ant bait products with fertilizer instantly reduces the attractiveness of the bait to the ant, but that bait applied simultaneously with fertilizer did not hinder ant foraging on bait particles.

Materials and Methods

This trial was conducted on pasture land on the Alex Gilstap and Bobby McGeehee Farms, Montgomery County, Texas. The test site is located along State Highway 105 in an area of clayey, Blackland soil and consists of two pastures. The first pasture is a mix of improved and native grasses. The second, adjacent pasture is a mixture of planted Switchgrass and Klein grass. Both pastures are moderately grazed throughout the year. Both pastures had fire ant mound densities of approximately 50 mounds per acre. That and the large size of both the ants and the mounds indicate a monogyne infestation.

Six test plots were marked and pre-counts taken on 10 June 1994. Plots consisted of 5 rectangles 450 ft. by 150 ft. or 1.55 acres or larger. Due to application considerations and a limited amount of treatment material, only one large plot was marked for each treatment. Within these treatment areas, three pieces of rebar were evenly spaced as sample subplot centers. Subplot samples consisted of a 58 foot circle encompassing 0.25 acres. The number of active red imported fire ant mounds were counted and recorded within each subplot area before and periodically after treatment (5 July, 20 July and 3 Oct. 1994). Mounds were considered active if numerous ants emerged from the mound upon minimal disturbance. Colony vigor was rated during post-treatment evaluations using a rating scale of 0 to 3, with 0 = no ants; 1 = 1 - 100 ants; 2 = 101 - 1,000 ants; 3 \geq 1,001 ants. Subplot data were analyzed using analysis of variance (ANOVA) and means separated using Tukey's Studentized Range test ($P \leq 0.05$).

On 14 June, treatments (**Table 3**) were applied using tractor mounted equipment. All fertilizer plus Amdro® treatments were applied using a PTO-operated Crop Spreader fertilizer applicator with a rotary-type agitator (setting 13). Amdro®, applied alone or simultaneously with urea was applied with an electric Herd GT-77 Seeder calibrated to apply 1.5 lbs. formulation per acre, and mounted on top of the Crop Spreader (**Fig. 1**). Treatments were applied between 5:15 and 7:15 pm. Ground was dry at time of application. Light rain was reported the evening before application, and rain was in the area during the middle of the night after treatments.

Results

The number of fire ant mounds initially present in each subplot was very similar between treatment plots:

- | | |
|-----------------------|---------------------------|
| 1) Untreated - 10,9,9 | 2) Amdro® - 12,11,14 |
| 3) Pursell - 15,14,18 | 4) Lessco - 8,13,16 |
| 5) Scott's - 10,11,17 | 6) Urea + Amdro - 9,13,14 |

None of the microencapsulated fertilizer plus Amdro® formulations reduced fire ant mound numbers or activity rating relative to the untreated plots (**Table 4**). Of the fertilizer blends evaluated, the J. M. Scott's & Sons, Inc. blend numerically outperformed other formulations.

Amdro applied alone significantly reduced ant activity ratings from 2 to week 4, while Amdro applied simultaneously with fertilizer significantly reduced both active mound numbers as well as activity throughout this 16 week trial, providing a 96 to 97 percent reduction in active mound numbers relative to untreated subplots. More effort to develop fertilizer plus Amdro® may result in an efficacious formulation. Fertilizer, applied simultaneously with Amdro® Insecticide Bait performed well and may be a useful treatment method for both urban and agricultural operations. Additional field trials will provide documentation for these treatments and treatment methods. In future work, a treatment using fertilizer (i.e., urea) alone should be added to determine if fertilizer suppresses fire ant mound numbers.

Conclusions

Results of trials reported here provide documentation for methods designed to reduce fire ant treatment costs. With little or no reduction in product performance, Logic® (fenoxycarb) spot treatments can suppress ants without the need for application equipment, and strip or skip-swath treatments can cut product and labor (time) costs in half. These alternative treatment methods should be considered by the manufacturer as additions or modifications to existing product labels.

Amdro® Insecticide Bait (hydramethylnon) continues to be the fastest acting conventionally formulated fire ant bait treatment. Simultaneous application of Amdro® while fertilizing pastures can reduce treatment costs, although two applicators must be mounted and calibrated on a single tractor and thorough coverage by both materials is necessary. Blending Logic® and Amdro® and applying the mixture at half rates of each product continues to provide a product performance profile that appears to offer both a quick suppression of ant mound numbers (characteristic of Amdro®) as well as long residual activity (characteristic of Logic®).

Results generated from these applied research trials do not constitute a recommendation for use of these practices by the Texas Agricultural Extension Service or the Texas Agricultural Experiment Station.

Table 3. Treatments and rates evaluated for suppression of red imported fire ant mound numbers, Montgomery County, Texas, 1994.

Treatment	Rate
1. Pursell Industries (LaRoche) 33-0-11 Mini plus Amdro® (green & yellow) 125 lbs./acre = 1.5 lbs. Amdro	188 lbs./1.5 acres
2. Lessco Poly Plus 35-0-0 plus Amdro® (yellow) 150 lbs./acre = 1.5 lbs. Amdro	225 lbs./1.5 acres
3. J.M. Scott & Sons, Inc. S-6012, Ext. No. 4-138-1CW plus Amdro® (orange) 103 lbs./acre = 1.5 lbs. Amdro®	150 lbs./1.5 acres
4. Amdro (1.5 lbs./acre), fertilizer Urea 45-0-0 (white) (300 lbs./acre = 65 lbs. N) Amdro® 3.2 lbs.*	600 lbs./2.2 acres
5. Amdro® (1.5 lbs./acre)**	2.25 lbs./1.5 acres
6. Untreated control**	1.5 acres

* (Note: due to space limitations, this plot was placed in a treated area in the shape of a triangle with two 450 feet sides for an area of 2.21 acres.)

** These two plots were located in an adjacent (across the fence) switchgrass field.

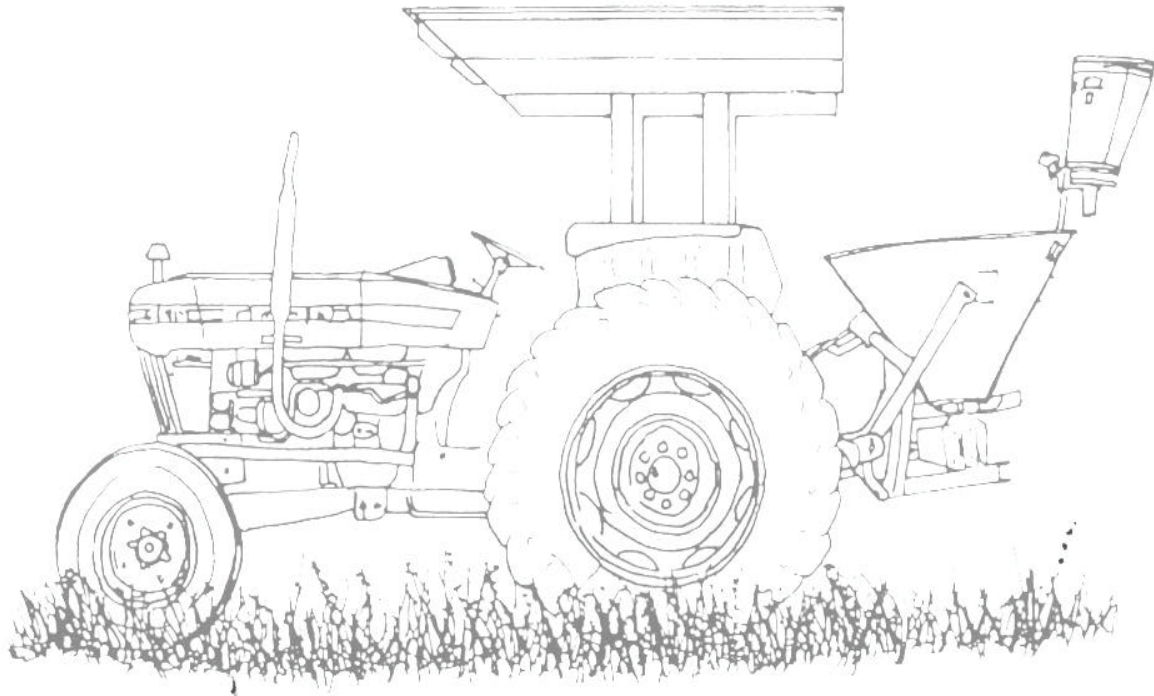
Table 4. Mean number of active red imported fire ant mounds and average activity rating per 0.25-acre circular subplot (n = 3), Dobbin, Texas, 1994.

Treatment	Weeks following treatment		
	2 weeks	4 weeks	6 weeks
	Mean no. mounds*		
Untreated control	9.33 ab	9.00 ab	10.00 ab
Amdro® (1.5 lbs./acre)	6.67 b	2.67 bc	3.33 bc
Pursell Industries + Amdro®	11.00 a	10.67 a	11.00 a
Lessco Poly Plus + Amdro®	9.67 ab	9.00 ab	8.33 ab
J.M. Scott's & Sons, Inc.	7.33 ab	5.67 abc	4.00 abc
Urea (300 lbs) + Amdro® (1.5 lbs./acre)	0.33 c	0.33 c	0.33 c
<i>F</i> -value	11.43	7.14	5.41
<i>P</i>	0.0005	0.0031	0.0087
MSE	2.8556	5.0556	7.2000
MSD	4.7922	60.764	7.6096
df	10		
Crit. Val.	4.912		

Treatment	Rating*		
Untreated control	25.33 ab	26.33 a	28.00 ab
Amdro® (1.5 lbs./acre)	10.00 cd	6.67 b	8.00 bc
Pursell Industries + Amdro®	32.00 a	29.67 a	30.67 a
Lessco Poly Plus + Amdro®	26.33 ab	25.33 a	23.33 ab
J.M. Scott's & Sons, Inc.	19.00 bc	14.00 ab	9.33 abc
Urea (300 lbs) + Amdro® (1.5 lbs./acre)	0.67 d	1.00 b	0.67 c
<i>F</i> -value	15.37	9.15	5.50
<i>P</i>	0.0001	0.0012	0.0082
MSE	19.2889	32.5667	59.8333
MSD	12.455	16.184	21.936
df	10		
Crit. Val.	4.912		

* Means followed by the same letter are not significantly different using analysis of variance (ANOVA) and means separated using Tukey's Studentized Range Test ($P \leq 0.05$). Colony vigor was rated during post-treatment evaluations using a scale of 0 to 3, with 0 = no ants; 1 = 1 - 100 ants; 2 = 101 - 1,000 ants; 3 \geq 1,001 ants. Rating indicates mean total per subplot.

Figure 1. Tractor mounted PTO-operated Crop Spreader fertilizer applicator with an electric Herd® GT-77 Seeder mounted on top, used to apply 1.5 lbs. per acre Amdro® simultaneously with 300 lbs./acre urea (45-0-0).



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Literature cited

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