

Comparison of individual mound treatments for red imported fire ants, *Solenopsis invicta* Buren (Hymenoptera: Formicidae)

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Red imported fire ants, *Solenopsis invicta* Buren, are nuisance insects that interfere with outdoor activities and their aggressive stinging can cause serious medical problems. In urban environments, fire ant control is a high priority (Drees et al. 2002). Treating individual fire ant mounds is the fastest way to kill fire ant colonies. There are numerous products on the market labeled to decrease fire ant populations from fire ant baits to mound drenches. Fire ant baits are an effective way to control fire ants, since baits are delivered into the mounds by the worker ants, so small amounts of baits are needed to eliminate the entire colony. This makes fire ant baits an environmentally friendly option for control. Fire ant baits on the market range from fast acting baits, such as those containing indoxacarb to slower acting baits, such as those containing insect growth regulators (Merchant and Drees 2006). In addition, there is a growing interest in using naturally derived insecticides for controlling all insects, including red imported fire ants. These products are termed “organic” (Drees and Lennon 1998). Current organic recommendations for controlling scales, thrips and aphids include insecticidal soaps and orange oil; however, these products are not currently labeled for use on fire ant mounds.

This trial was established to determine the efficacy of individual mound treatments using fire ant baits compared with an organic mound drench treatment using a combination of Medina® Orange Oil (Medina Agriculture Products Co., Inc., Hondo, TX) and Dawn® liquid dishwashing soap.

Materials and Methods

On June 3, 2008, twenty-four plots were established at the Texas AgriLife Research and Extension Center in Dallas, TX (Figure 1). We began measuring plots at 11:00pm with temperatures at 88° F. Flags were inserted into the ground to mark the beginning and end of each plot. Within each plot, 6 active fire ant mounds were flagged. Red imported fire ant mounds were counted within each plot by disturbing suspected mound sites with a stick to determine activity. Mounds were considered active if many (dozens of) worker ants were observed within 15 seconds.

The width of the plots was 108 feet, but the length varied between the plots. Plot lengths were arrayed from shortest to longest, then divided into 4 blocks containing 4 treatment plots each. This allowed the total length of plots for all the treatment plots to be roughly equal, so colony migration into and out of the plot areas was similar for all treatments. Within each block, treatments were assigned to plots at random in order to minimize pre-treatment differences in total plot length (Table 1).

The treatments included:

- 1) Amdro® (0.73% hydramethylnon)- 2 tablespoons per mound
- 2) Amdro® Bait Block™ (0.88% hydramethylnon)- 1 oz per mound

- 3) Amdro® Fire Strike™ (0.250% methoprene and 0.365% hydramethylnon)- 2 tablespoons per mound
- 4) Spectracide® Once N Done!™ Insect Killer (0.5% lambda-cyhalothrin) – 2 tablespoons per mound
- 5) 1.5 fl oz Medina® Orange Oil and 3 fl oz Dawn® Soap/ gal water per mound
- 6) Untreated Control

Treatments were applied beginning at 7:00 am on June 4, 2008 with temperatures at 82° F. Evaluation of mound activity was conducted prior to application and at 3, 7, 14 and 28 days post treatment. For the evaluation process, red imported fire ant mounds were determined to be active within each plot by disturbing suspected mound sites with a stick to determine activity. Mounds were considered active if many (dozens of) worker ants were observed within 15 seconds. Data were analyzed using Analysis of Variance (ANOVA) test with means separated using Duncan's Multiple Range Test at $P \leq 0.05$ (SPSS for Windows, Lead Technologies, Version 13.0).

Results and Discussion

At 3 days, there were no significant differences in fire ant mound activity between the treatments and the control (**Table 2**). After 7 and 14 days following application, the number of active mounds in the Spectracide® (lambda-cyhalothrin, a pyrethroid insecticide) and Orange Oil/Soap (home remedy) treatment plots were significantly less than the other treatments and the control. At 28 days, the same two treatments had significantly reduced mean (average) active ant mounds per plot. However, Amdro® (hydramethylnon) and Amdro® Firestrike™ (hydramethylnon plus methoprene) bait treatments were not significantly different in mound numbers from the untreated control. In the Amdro® Ant Block™ (hydramethylnon in a sucrose-added conventional bait formulation) treated plots, active ant mound numbers were significantly higher than in the untreated mound plots.

Overall, the Spectracide® and Orange Oil/Soap combination had numerically less active fire ant mounds compared to the other treatments. Further tests should be conducted to confirm this study.

The average daytime temperature throughout the study was 100°F with a total of 5 inches of rain. The high temperatures and low rainfall could have impacted this study.

Table 1. Treatment block assignments based upon plot length.

Treatment	Plot Number	Plot Length (ft)
Amdro®	4, 10, 13, 19	72, 165, 183, 57
Amdro® Ant Block™	1, 9, 18, 22	114, 237, 87, 174
Amdro® Firestrike™	5, 7, 14, 21	234, 267, 75, 144
Spectracide® Once N Done!™	3, 11, 17, 24	75, 57, 57, 93
Medina® Orange Oil and Dawn® Soap	6, 8, 15, 23	177, 150, 51, 147
Untreated Control	2, 12, 16, 20	129, 162, 111, 126

Table 2. Number of active red imported fire ant mounds in individual mound test observed at Texas AgriLife Research and Extension Center, Dallas, TX.

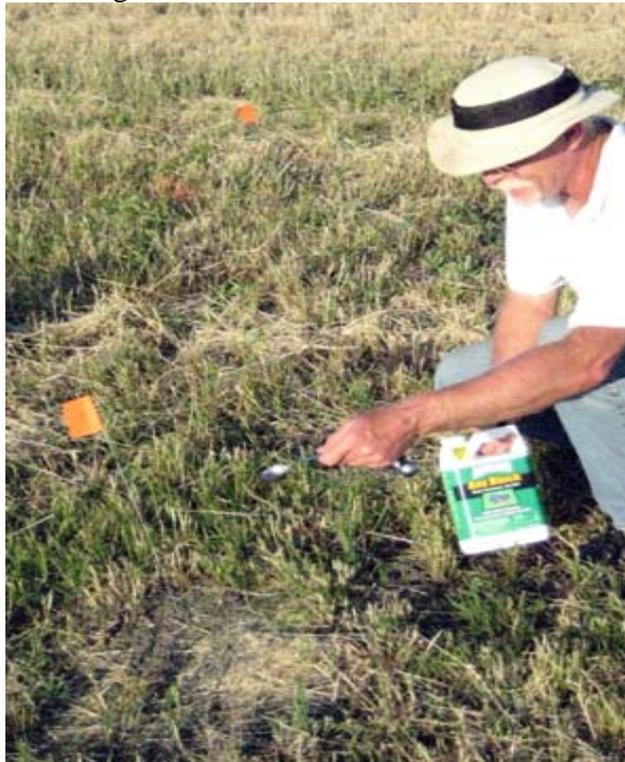
Treatment	3 Days	7 Days	14 Days	28 Days
Amdro®	4.75a	4.50b	4.50b	2.50b
Amdro® Ant Block™	6.00b	6.00c	5.75b	5.25c
Amdro® Firestrike™	6.00b	5.00bc	4.50b	1.50ab
Spectracide® Once N Done!™	4.75a	0.75a	0.25a	0.25a
Medina® Orange Oil and Dawn® Soap	5.00ab	0.50a	0.00a	0.00a
Untreated Control	5.00ab	5.00bc	4.50b	2.75b

^aMeans followed by the same letter within the same column were not significantly different using Analysis of Variance (ANOVA) and means separated using Duncan's Multiple Range Test at $p \leq 0.05$ (SPSS, Windows 11.5).

Figure 1. Testing site for the individual fire ant mound trial on 45 acres at the Texas AgriLife Research and Extension Center, Dallas, TX.



Figure 2. Treating individual mound with Amdro® Bait Block™ (0.88% hydramethylnon) at the Texas AgriLife Research and Extension Center, Dallas, TX.



Literature Cited

Drees, B. M. And L. Lennon. 1998. A review of “organic” and other alternative methods for fire ant control. Fire Ant Plan Fact Sheet FAPFS012. Texas Imported Fire Ant Research & Management Project, Texas A&M University System, College Station, Texas. 8 pp.

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