

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

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Red imported fire ants, *Solenopsis invicta* Buren, are aggressive insects that interfere with outdoor activities and their sting can cause serious medical problems. This elevates controlling fire ants to a high priority (Drees et al. 2002). Treating individual fire ant mounds is the fastest way to kill fire ant colonies, if the mounds are present in the landscape. There are many products on the market labeled to decrease fire ant populations from fire ant baits to mound drenches. In Texas, there is a growing interest in using naturally derived or “organic” insecticides for controlling red imported fire ants (Drees and Lennon 1998). This trial was established to determine the efficacy of treating individual fire ant mounds using a synthetic granular fire ant product compared to two organic mound drench treatments, one was a sesame oil and the other was a combination of Medina® Orange Oil (Medina Agriculture Products Co., Inc., Hondo, TX) and Dawn® liquid dishwashing soap.

Materials and Methods

On October 16, 2009, sixteen plots were established at Myers Park, McKinney, TX. We began measuring plots at 1:00 pm with temperatures at 78° F. Flags were inserted into the ground to mark the beginning and end of each plot. Within each plot, 10 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 and length varied between the plots. Plot areas were arrayed from smallest to largest and then divided into 4 blocks containing 4 treatment plots each. This allowed the total area 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 area (**Table 1**).

The treatments included:

- 1) Spectricide® Once N Done! Insect Killer (0.1% lambda-cyhalothrin)- 2 tablespoons per mound
- 2) 1.5 fl oz Medina® Orange Oil and 3 fl oz Dawn® Soap/ gal water per mound
- 3) Organocide™ Insecticide and Fungicide (0.5% sesame oil)- ¼ cup/gal water per mound
- 4) Water Control- 1 gal water per mound

Treatments were applied beginning at 10:00 am on October 20, 2009 with temperatures at 76° F. Evaluation of mound activity was conducted prior to application and at 3, 7, 12, 14, 25 and 30 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 the 3, 7, and 12 day observations, there were significantly less active fire ant mounds in the Spectricide® and the combination of orange oil and Dawn® soap treated plots compared to the other treatments; also the Organocide™ treated plots had significantly less active fire ant mounds compared to the water controls (**Table 2**). At the 14, 25 and 30 day observations, Spectricide® had significantly less active fire ant mounds compared to the other treatments; the combination of orange oil and Dawn® soap had significantly less active fire ant mounds compared to the Organocide™ and water treatments; the Organocide™ had significantly less active fire ant mounds compared to the water control plots.

Overall, the Spectricide® treated plots had significantly fewer active fire ant mounds compared to the other treatments. Both the Spectricide® and the combination of orange Oil and Dawn® soap had less active fire ant mounds compared to the other treatments throughout the study. Further tests should be conducted to confirm the recommendation of orange oil and Dawn® soap.

The average daytime temperature throughout the study was 76°F with a total of 7 inches of rain.

Table 1. Treatment block assignments based upon plot area (ft²).

Treatment	Plot Number	Plot Area (ft²)
Spectricide®	2, 8, 9, 12	5104, 2805, 2044, 3744
Medina® Orange Oil and Dawn® Soap	1, 4, 6, 14	2025, 4410, 3024, 3510
Organocide™	7, 10, 11, 15	1836, 4288, 3248, 4590
Water Control	3, 5, 13, 16	1768, 4278, 3400, 4050

Table 2. Number of active red imported fire ant mounds in individual mound test observed at Myers Park, McKinney, TX.

Treatment	3 Days	7 Days	12 Days	14 Days	25 Days	30 Days
Spectricide	2.75a	3.00a	2.75a	2.00a	1.50a	1.25a
Orange Oil/Dawn	4.00a	3.00a	3.00a	4.00b	3.50b	3.25b
Sesame Oil	7.00b	6.50b	6.25b	6.25c	5.75c	5.50c
Water Control	10.00c	9.00c	8.75c	8.75d	8.75d	8.25d
<i>df</i>	3	3	3	3	3	3
<i>F value</i>	46.95	37.36	17.65	42.74	62.00	82.81
<i>Significance</i>	0.00	0.00	0.00	0.00	0.00	0.00
<i>Mean Square</i>	42.06	34.25	32.73	33.83	38.75	36.23

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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