

## **Preliminary Evaluation of D-20 Fire Ant Control: a Pyrethrins plus Diatomaceous Earth Mound Drench Product**

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The product, D-20 Fire Ant Control, contains 0.02 percent pyrethrins plus 98.7 percent inert ingredients composed of diatomaceous earth. Pyrethrins are synergized by 1.1 percent technical piperonyl butoxide. This product is widely registered for indoor uses for the suppression of ants, bedbugs, fleas, houseflies and other household pests. It was recently labeled for treatment of the red imported fire ant, *Solenopsis invicta*, Buren, as either an individual mound drench or as a powder or dust application.

The individual mound drench or “water method” uses 4 tablespoons of D-20 to one gallon of water. Directions for use are as follows: “For best results, saturate the perimeter of the mound first working toward the center of the mound in a circular motion. After mound is saturated, inject mixture into mound cavity in different places. (You may want the mixture to “puddle”). An ant mound 12-14 inches in diameter requires approximately one gallon of the mixture. You will begin to see results immediately. In approximately 20 minutes, you can expect a kill ratio of 85-95%.”

We conducted a brief result demonstration to evaluate D-20 Fire Ant Control applied as an individual mound drench. No injection equipment was used. Since pyrethrins and diatomaceous earth are both effective only when in direct contact with insects, the mound drench method was selected to provide the highest probability of achieving suppression of ant activity in treated mounds.

### **Materials and Methods**

This trial was initiated 11 September 1991 on the earthen dam of Lake Somerville, Burleson County, Texas. Test plots were located on the far southeast end of the dam, near the floodgate, in regularly mowed grassland. The area is controlled by the U.S. Army Corps of Engineers and access is strictly limited to maintenance and Corps personnel.

A pre-treatment survey of the three (0.083-acre) quadrants of a 58-foot radius (0.25 acre) circle was made during which fire ant active mounds were marked with surveyor’s flags for easy location during application and evaluation. Evaluations were made by light disturbance of the mound site with a pointed stick. A mound was considered fire ant active if ants moved rapidly to the surface upon disturbance.

D-20 Fire Ant Killer was applied as a drench to every fire ant active mound located in the pre-

treatment survey at a rate of 4 tablespoons of D-20 Fire Ant Control in one gallon of water per undisturbed mound. A garden sprinkler bucket was used to apply the solution to the mounds. Most of the volume was poured on top of the mound while about one third was sprinkled in a three foot diameter area around the mound site.

Following treatment, only the flagged (treated) mounds were evaluated (18 September and 7 October) until the last evaluation date (25 November), when the quadrants were surveyed for marked and “new” fire ant active mounds within the plots. New mounds located on this date represent either “satellite” colonies formed when originally treated colony survivors moved to a new site(s) or immigrant colonies moved into the plot from surrounding areas.

An additional set of three quadrants of a 0.25-acre circle were left untreated and served as a control plot. Fire ant active mounds were monitored 22 August, 21 October and 25 November. Resulting active mound numbers between D-20 and untreated quadrants (subplots) were analyzed using the Student’s *t* test (*P* # 0.05).

## **Results and Discussion**

We found D-20 Fire Ant Control easy to mix and apply. The formulation dissolved readily and had a non-offensive odor. The D-20 mound drench treatment eliminated ant activity in 72 percent of the mounds treated within one week. Compared to untreated plots, fire ant active mound numbers were significantly reduced by 75% within one month. Two and a half months following application, 91 percent of the treated mounds contained no live ants. However, numerous “new” fire ant active mounds were detected in areas where D-20 treatments had been applied. Thus, only 43 percent fewer active mounds were found in these plots relative to untreated plots. Since these plots were very small, reinfestation could conceivably have resulted from the immigration of untreated colonies. Further testing would be needed to determine if these new ant active mounds resulted from the formation of satellite colonies from the originally treated mounds.

**Table 1.** Average number (mean ± standard deviation or S. D.) Of fire ant active mounds per three 0.083-acre quadrants within 0.25-acre circular treatment and control plots. Mounds

within quadrants were treated with D-20 Fire Ant Control (0.02 % pyrethrins + 1.1% piperonyl butoxide + 98.7 % diatomaceous earth) or left untreated in the control plot quadrants (Burleson County, Texas, 1991).

Mean number of fire ant active mounds per quadrant

<u>Date</u>	-----Treatment-----	
	<u>D-20 Fire Ant Control</u>	<u>untreated</u>
Pre-treatment:		
11 September	10.67 ± 0.58 S.D.	10.00 ± 2.65 S.D.
Post-treatment:		
18 September	3.00 ± 0.00	---
(1 week)		
10-21 October	2.67 ± 1.15*	10.67 ± 3.21*
(1 month)		
25 November		
(2.5 months)		
Treated mounds:	1.00 ± 0.00**	11.00 ± 3.61**
All mounds:	6.33 ± 0.58***	11.00 ± 3.61***

\* Means are significantly different according to the Student's *t* test (d.f. = 4, *t* = -4.06; P < 0.01).

\*\* Means are significantly different according to the Student's *t* test (d.f. = 4, *t* = -4.80; P < 0.01).

\*\*\* Means are significantly different according to the Student's *t* test (d.f. = 4, *t* = -2.21; P < 0.05).