

CULTURAL AND CHEMICAL RED IMPORTED FIRE ANT SUPPRESSION PROGRAM EVALUATION

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The red imported fire ant, *Solenopsis invicta* Buren, is considered to be a serious pest of hay and cattle production in Texas. Tall, hardened mounds have been reported to break machinery, particularly sickle bar-type cutters, or force producers to raise their cutting height, thereby losing yield. This trial was conducted to provide documentation of the effect of insecticide applications (broadcast applications of Amdro® Fire Ant Granules (hydamethylnon) and cultural practices (dragging heavy metal bar to knock down mounds and level dirt), alone and in combination on the number and height of fire ant mounds in a grazed pasture.

MATERIALS AND METHODS

On 13 May 1993, a grazed pasture in Colorado County was divided into 6 areas. Sizes of these areas and treatments assigned to each area are listed below:

<u>Treatment</u>	<u>Dimensions (ft.)</u>	<u>Acres</u>
1. untreated control	130 x 512	1.53
2. Amdro® (1.5 lbs./acre) applied twice per year	130 x 512	1.53
3. Amdro® (1.5 lbs./acre) applied twice per year and dragged after initial application	130 x 512	1.53
4. Mounds dragged only	130 x 512	1.53
5. Amdro® (1.5 lbs./acre) applied one per year	207 x 520	2.52
6. Amdro® (1.5 lbs./acre) applied one per year and dragged after initial	207 x 520	2.52

Amdro® was applied using a Cyclone® Model 1C1 seeder. Mounds were dragged, 10 June 1993, using a 16 ft. offset disc set at a depth of 1 inch. Plots (treatments 3, 4 and 6) were cultivated using a tractor-pulled toothed harrow behind which a metal rail was dragged to break apart clumps of soil.

Prior to initial treatment and periodically thereafter, red imported fire ant mounds were evaluated

in three 0.25-acre circular subplots within each plot. Mound numbers, presence or absence of an ant colony and mound heights were recorded for each plot except in treatments 5 & 6 where only the number of active ant mounds were recorded. These data were used to calculate mound density, average mound height and active ant mounds.

This test is ongoing. A second application of Amdro® was applied on 12 November 1993. These plots will be monitored in the spring and fall of 1994.

RESULTS AND DISCUSSION

Height distribution and numbers of red imported fire ant mounds within treatment plots are depicted in Fig. 1. Prior to treatment and dragging, mounds averaged 6.3 to 8.1 inches in height (Table 2). The combination of a broadcast application of Amdro® Fire Ant Granules followed by dragging dramatically reduced active ant mound numbers (from 20 to 4, or 80 percent) and height from (8.1 to 3.8 inches) by 30 June. Dragging alone reduced mound height from 6.3 to 4.3 inches, but did not dramatically reduce active ant mound numbers by 30 June. In fact, by 12 November, ant mounds in this treatment plot had greatly increased in numbers (from 106 pre-treatment to 230 mounds). In Amdro® treated plots, the number of active ant mounds was reduced by 30 June (from 53 to 20 mounds), but had recovered by 12 November (to 108 mounds). Mound height in these subplots was unaffected.

In this trial, the height of all (active and inactive) mounds within subplots was measured. Not all mounds within untreated or treated areas were found to be occupied (Note: in the untreated plot 38 of 68 and 44 of 88 mounds were unoccupied on 30 June and 12 November, respectively (Table 2)). Insecticide applications applied to suppress fire ants in an attempt to reduce average mound height did not succeed within the five month period monitored. Insecticide treatment would not be expected to affect the height of a mound not occupied by ants. The "old" mounds in this field were completely overgrown with bermuda grass and other weeds, making them very resistant to weathering.

Table 1. Red imported fire ants mounds (total and active) per 0.25 acre subplot areas in an unimproved pasture, Colorado Co. Texas 1993.

	Untreated	Amdro®x2	Amdro®x2 leveled	Untreated	Amdro®x1	Amdro®x1 leveled
May 13, 1993:						
Total	8.3b	10.3b	24.0a	35.3a		
Active	8.3b	9.0b	18.0b	35.0a	40,8,5,9	-, -, -
June 30, 1993:						
Total	23.0ab	1.7c	23.7a	22.0ab		
Active	6.7bc	1.0c	10.0b	21.0a	2,4,2	1,2,0
Nov. 12, 1993:						
Total	29.3bc	12.7c	49.0ab	74.0a		
Active	14.7bc	8.7c	36.3b	73.3a	43,16,10	12,13,7

* Means in lines followed by the same letter(s) are not significantly different using ANOVA and Duncan's Multiple Range Test ($P \leq 0.05$) ($F = 25.5, 12.1, 106.2, 24.5, 10.4$ and 18.9 , respectively).

Table 2. Effect of dragging a pasture and/or use of insecticide on red imported fire ant mound height and number, Colorado County, 1993.

	Untreated leveled	Amdro®x2	Amdro®x2 leveled	Untreated
Fire ant mound height (inches) \pm S.D. (number)				
May 13:				
Active	6.3 \pm 1.9 (106)	6.5 \pm 2.0 (53)	8.1 \pm 2.1 (20)	7.6 \pm 3.0 (25)
Total	6.3 \pm 1.9 (106)	6.5 \pm 2.0 (55)	8.1 \pm 2.1 (20)	7.6 \pm 3.0 (25)
June 30:				
Active	4.3 \pm 1.5 (62)	6.7 \pm 2.8 (20)	3.8 \pm 0.5 (4)	10.0 \pm 3.7 (30)
Total	4.3 \pm 1.5 (65)	6.7 \pm 1.9 (70)	3.8 \pm 0.4 (5)	9.0 \pm 3.4 (68)
Nov. 12:				
Active	4.1 \pm 1.7 (230)	6.4 \pm 2.0 (108)	3.6 \pm 1.4 (26)	8.7 \pm 3.6 (44)
Total	4.1 \pm 1.7 (230)	6.0 \pm 2.0 (145)	3.8 \pm 1.4 (37)	8.0 \pm 3.2 (88)

Fig. 1. Red Imported Fire Ant Mound Occurrence by Height (inches), Colorado Co., TX, 1993
 ('-' denotes inactive mound, X = active mound)

13 May 1993				
Height				
15		X-		
14			X	
13	X			
12	XX	X-		X
11	XX	-		
10	XX	XX	XX	XXXXX
9	XX	XXXXX	XXXXX-	XXXXXX
8	XXXX	XXXXXXXX	XXXXXXXX	XXXXXXXXXXXXXXXXXXXX
7	XXXX	XXXXXX	XXXXX-	XXXXXXXXXXXXXXXXXXXX
6		XXXXX-	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
5	XXX	X	XXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
4	XXX		XXX	XXXXXXXXXXXXXXXXXXXX
3	X		XXX	XXX
2	X			
	UNTREATED	AMDROx2 LEVELED	AMDROx2	UNTREATED LEVELED

30 June 1993				
Height				
16	X-			
15	XX			
14	X			
13	XXXXXXXX--			
12	X-			
11	XX--		X-	
10	XX--		X-	
9	XX-----		--	
8	XX---		XX-----	X
7	XXX--		XXXXXX-----	XXXX
6	X-----		XXX-----	XXXXXXXXXXXX
5	XX--		XXX-----	XXXXXXXXXXXX
4	XX--	XX--	XX-----	XXXXXXXXXXXX--
3	X	X	X	XXXXXXXXXXXX--
2				XXXXXX
	UNTREATED	AMDROx2 LEVELED	AMDROx2	UNTREATED LEVELED

Fig. 1, cont. Red Imported Fire Ant Occurrence by Mound Height (inches), Colorado Co., TX. 1993
 ('-' denotes inactive mound, X = active mound)

12 November 1993				
Height				
18	X			
17				
16				
15	X			
14	XX-			
13	XX		X	
12	XXXX--			
11	XXX--			
10	XXXXXXXX-----		XXXXX-	
9	XXX--		XXXXXXXXXX-	x
8	XX--		XXXXXXXXXXXXXXXXXXXX	xxxx
7	XXX-----		XXXXXXXXXXXXXXXXXXXX--	xxxxxx
6	XXXXXXXX-----	XX-	XXXXXXXXXXXXXXXXXXXXX-----	xxxxxxxxxx
5	XXXX----	XXXXXX-	XXXXXXXXXXXXXXXXXXXX-----	xxxxxxxxxxxxxxxxxxxxxx
4	XXX---	XXXXXX----	XXXXXXXXXXXXXXXXXXXX-----	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
3	X--	XXXX-	XX	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
2	X	XXXXXXXXXX-	XX-	xxxxxxxxxxxxxxxxxxxxxx
1			X	xx
	UNTREATED	AMDROx2 LEVELED	AMDROx2	UNTREATED LEVELED (x = 2 mounds)