

## EVALUATION OF ACEPHATE 15G (PINPOINT™) FOR SUPPRESSION OF RED IMPORTED FIRE ANTS IN TURFGRASS

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Although Orthene® Turf, Tree and Ornamental Spray (Valent U.S.A. Corp.) and Orthene® Fire Ant Killer (Solaris), both formulations of 75 percent acephate wettable powder, have become standard individual fire ant mound treatments, broadcast application of these formulations are not registered fire ant treatments. Surface treatments are thought to not have sufficient residual activity to suppress ant mound activities. Trials reported here were conducted to evaluate the efficacy of acephate 15% granular insecticide, marketed to the turf industry as Pinpoint™ and to the cotton market as Payload® when broadcast applied to ornamental landscapes for control of red imported fire ants, *Solenopsis invicta* Buren.

### Materials and Methods

Trial 1. This trial was established on The Texas A&M University Riverside Campus, 16 December 1993, in an area of mowed turf. Plots consisted of 16 1/8-acre (75 ft. X 75 ft.) squares arranged in a block and were surveyed for fire ant mounds by counting the number of active ant mounds in each entire plot using the minimal disturbance method. An ant mound was considered active if a dozen or more ants rose to the surface within 15-30 seconds after light disturbance. All subsequent evaluations were made in a similar manner.

Pre-treatment mound numbers were arrayed from highest to lowest and then grouped into 4 blocks of 4 plots each. Treatments were assigned randomly within blocks. Treatments were applied, 10 January 1994, and included: 1) untreated control; 2) 6.67 lb/acre 15% acephate (Pinpoint™); 3) 13.3 lb/acre Pinpoint; and 4) 5% diazinon (Ortho® Diazinon Soil & Insect Control, 2 lb/acre). Treatments were applied using an Earthway® Ev-N-Spred® push-type broadcast spreader. Data were analyzed using analysis of variance (ANOVA) and the Tukey's Studentized Range Test ( $P \leq 0.05$ ).

Trial 2. This trial was conducted on mowed ornamental Bermuda grass on The Texas A&M University Riverside Campus. On 10 October 1994, 16 plots, 0.096 or 1/10 acre (65 by 65 ft.) in size were established. The number of active red imported fire ant mounds within a 32.5 ft. radius (0.076 or 1/13 acre) circle within each plot was counted. The plots were arrayed from lowest to highest number of ant mounds and separated into four blocks (replicates) of four plots each. Treatments were randomly assigned to one plot within each block, and treated 11 October 1994: 1) 15% acephate (Pinpoint™) at 3.75 lb. a.i. or 25 lbs./acre (2.5 lbs./plot); 2) Pinpoint at 6.45 lb. a.i. or 43 lbs./acre (4.3 lbs./plot); 3) acephate 75% WP (Orthene® Tree, Turf and Ornamental Spray) applied at 2 tsp./mound, documenting the number of mounds treated; and 4) untreated control.

Broadcast treatments were applied using a push-type Earthway® Ev-N-Spred® broadcast applicator. A second treatment was applied, 28 October (17 days post-treatment, delayed from 10 days post-treatment by weather) using the same treatments. Plots were evaluated 10 (20 Oct.), 31 (10 Nov.) and 63 (12 Dec.) days following initial application. Data were analyzed using analysis of variance (ANOVA) and the Tukey's Studentized Range Test ( $P \leq 0.05$ ).

## Results and Discussion

Trial 1. At the time of treatment weather conditions were as follows: Temperature: 60-65 degrees F, cloudy, windy. The soil was dry and the ants relatively active. The plots received a light rain within 2 hours of treatment. The next substantial rain was received between the first and second post-treatment evaluations. Treatment using the Earthway® Ev-N-Spred® push-type broadcast spreader was difficult to accomplish. Calibration required reducing the size of the openings in the spreader hopper. The gate opening was closed to the extent that further closing prohibited any flow of the granular material and wider opening resulted in over-treatment. Single application of either 6.67 or 13.31 lbs. Pinpoint® per acre resulted in no noticeable reduction in fire ant mound numbers (**Table 1**). The diazinon application had minimal affect until after a rainy period that occurred between the 1 week and 1 month post treatment evaluations.

Trial 2. The number of mounds treated with 75% acephate for each replicate plot were as follows: I-16; II-22; III-45; IV-40. On 15 October, the area received about 0.7 inch rainfall. However, beginning in the evening of 16 October, over 13 inches of rainfall were recorded in a 24 hour period. The plots are well drained, but the massive rainfall may have washed much of the acephate applied out of the plots. During the second application, 28 October, the number of mounds treated with 75% acephate were as follows: I-25; II-20; III-18; IV-16.

The number of active ant mounds increased in the untreated plots during the course of this trial due to periods of heavy rainfall. Initially, the acephate treatments merely prevented or suppressed similar increases in ant mound numbers from occurring in treated plots (**Table 2**). Reduction of ant mounding activity appeared slowly in treated plots with significant reductions (55 to 59 percent) occurring 10 Nov., 31 days following initial application. Maximum suppression from treatments (70-73 percent) occurred 12 Dec., 63 days following initial application. During the last two monitoring dates, reduced ant mound building activity in treated plots was observed relative to untreated plots. No differences in performance were documented between the three acephate treatments. This is the first trial we have conducted where individual mound treatments using 75% acephate dust did not perform with 95 to 100 percent effectiveness. Heavy rains and mild temperatures conducive to ant mound building during this period may have been a factor in this reduced performance.

**Table 1.** Number of red imported fire ant mounds per 1/8 acre plot before and after 10 January 1994 treatments using 15 percent acephate granules (Pinpoint®) or Ortho® Diazinon Soil & Insect Control, Brazos Co., Texas.

Treatment	Mean no. active mounds per 1/8 acre plot*		
	Pre-count	1 week	1 month
Untreated	26.50 a	26.5 a	20.50 a
acephate 15G, 6.67 lb	25.25 a	25.5 a	21.25 a
acephate 15G, 13.31 lb	26.50 a	27.5 a	19.00 a
1% diazinon, 2 lb/acre	25.75 a	20.0 a	3.50 b
<i>F</i> =	21.38	3.63	3.44
<i>P</i> =	0.0001	0.0140	0.0476
d.f. =	9	9	9
MSD =	7.722	14.693	15.321

\* Means in columns with the same letters are not significantly different using analysis of variance (ANOVA) and the Tukey's Studentized Range Test ( $P \leq 0.05$ ).

**Table 2.** Mean number of red imported fire ant mounds per 32.5 ft. radius circle subplots following acephate 15% granular (Pinpoint®) treatments 11 and 28 October 1994, Brazos County, Texas.

Treatment	Mean* no. red imported fire ant mounds per 32.5 ft. radius circle			
	Pre-treatment	10 days	31 days	63 days
	10 Oct.	20 Oct.	10 Nov.	12 Dec.
acephate 15G 3.8 lbs.	23.00 a	26.75 ab	18.50 b	11.50 b
acephate 15G 6.5 lbs.	22.75 a	27.00 ab	17.00 b	12.25 b
acephate 75 WP 1-2 tsp./mound	21.25 a	21.75 b	18.25 b	11.25 b
untreated control	22.50 a	34.00 a	41.00 a	41.00 a
<i>F</i> =	12.66	6.28	27.42	5.32
<i>P</i> =	0.0006	0.0077	0.0001	0.0132
d.f. =	9	9	9	9
MSD =	8.1357	10.864	7.1364	21.377

\* Means in columns with the same letters are not significantly different using analysis of variance (ANOVA) and the Tukey's Studentized Range Test ( $P \leq 0.05$ ).