

**ORTHO® ANT-STOP® ORTHENE FIRE ANT KILLER (ACEPHATE 75% WP)  
FORMULATIONS AND CYFLUTHRIN (TEMPO®) EVALUATED  
AS DUST APPLICATIONS FOR RED IMPORTED FIRE ANT MOUNDS**

Bastiaan M. Drees, Professor and Extension Entomologist and  
Charles L. Barr, Extension Associate

The application of dust formulations to individual mounds of the red imported fire ant, *Solenopsis invicta*, is a widely accepted method because of the low cost and low labor required for treatment. The per mound treatment cost is estimated to be about \$0.15 for Ortho® Ant-Stop® Orthene® Fire Ant Killer (Solaris) or Orthene® Turf, Tree and Ornamental Spray (Valent U.S.A.), both 75% wettable powder formulations of acephate. Use of water as a diluent or applied after treatment is not required or suggested as is the common practice for most individual fire ant mound treatments. This trial was conducted to evaluate new formulations of 75% acephate. In addition, a formulation of the pyrethroid cyfluthrin, Tempo® 0.1% Dust (Bayer Agric. Div.) was evaluated.

**Materials and Methods**

Trial 1. This trial was conducted behind the dam at Lake Somerville, in Burleson Co., Texas. Twenty plots, 30 ft. wide, were established so that each plot contained ten fire ant mounds, thus varying in length. Each mound was marked with a field flag. Plot lengths were arrayed from longest to shortest and divided into 4 blocks or replicates. Treatments were then assigned randomly to one plot within each block. Treatments were applied 16 May 1995. Three formulations of Orthene® Fire Ant Killer (75% acephate SP) and Tempo® 0.1% Dust (cyfluthrin) were evaluated and compared to an untreated check (three treatments, total). Treatments were applied as topical dusts to red imported fire ant mounds according to manufacturers' instructions. Amounts of material used varied with mound size for Tempo® 0.1% Dust:

<u>Product</u>	<u>Mound diameter (inches)</u>	<u>Dosage/Mound</u>
Ortho® Ant-Stop® Orthene® Fire Ant Killer	all	2 tsp.
Tempo® 0.1% Dust	6	1 tsp.
	12	1 tbsp.
	18	2 tbsp.

Periodically (7, 14 and 30 days) following treatment, treated mounds were inspected for ant mounding activity using the minimal disturbance method. On the last evaluation date, plots were also inspected for additional ant mounds, representing immigrant colonies and/or "satellite" mounds formed by survivors of initially-treated mounds. Results were analyzed using Analysis Of

Variance (ANOVA) and means separated using Tukey's Studentized Range Test ( $P \leq 0.05$ ).

Trial 2. Twenty plots, variable in length and ranging from 22 to 45 ft. in width and containing ten active red imported fire ants (polygyne form) each were established, September 26, 1995, along a road side bordering Royalty Pecans, Burleson County, Texas. Plots were arrayed by plot length and divided in to four blocks (replicates). Treatments were randomly assigned to each block.

Treatments and rates included:

1. untreated control
2. Ortho® Ant Stop® Orthene® Fire Ant Killer (75% dust) - 2 teaspoons/mound
3. SF18881 Orthene (75% dust)(NB5608561) - 2 teaspoons/mound
4. SF18898 Orthene (75% dust)(NB5608561) - 2 teaspoons/mound
5. Velocity® (15% acephate granular) - 2 tablespoons/mound

Additional mounds found in treatment plots at time of application were treated with the product assigned to that plot and mounds were marked with blue flags and no longer considered for evaluation.

Ant mounds were considered active is 12 or more ants emerged from the top of the mound displaying defensive behavior after minimal disturbance. All active mounds were marked with plot flags. Periodically after treatment (3, 7, 14 and 30 days), treated mounds were evaluated for activity. Results were analyzed using analysis of variance (ANOVA) and means were separated using Tukey's Studentized Range Test ( $P \leq 0.05$ ).

## Results and Discussion

Trial 1. The experimental formulations of acephate 75% WP were developed to overcome the objectionable mercaptan based odor of the current formulations. These new formulations appeared to contain perfuming masking agents: SF-18881, NB# 5608530 smelled somewhat like almonds and SF-18898, NB# 5608530 smelled something like carpet freshener. Although in casual contact these formulations smelled similar to cleaning products, the odors could become overpowering during instances of higher exposure that occasionally happen during application.

All acephate 75% WP formulations tested performed statistically similar during the course of this trial (**Table 1**), although numerically more "new" mounds were documented in the plots treated with the experimental formulations 4 weeks after treatment. Ant mounds in cyfluthrin (Tempo® 0.1% Dust) treated plots declined more slowly over time, and these plots contained numerically higher numbers of "new" mounds at the end of the trial. Although active ant mound numbers slowly declined in untreated plots over the course of time, most likely because of hot weather and little rain, total mound numbers within each set of treatment plots at the end of the trial indicate that only those treated with Ortho® Ant-Stop® Orthene® Fire Ant Killer contained fewer mounds than did untreated plots, providing 96.7 percent suppression of mound numbers.

Trial 2. Statistically, all acephate formulations tested performed similarly, providing 100 percent elimination of ant activity in treated mounds within 1 week (**Table 2**). Numerically, SF 18898 did not perform as well as other treatments. Satellite mound formation was not significantly different between treatments at the end of the monitoring period.

Velocity is sold in 12 oz. shaker cans with instructions to use 2 tablespoons per mound. Two cans treated 35 mounds (17.5 mounds per can). The Spread Rite G applicator provided by the manufacturer of Velocity was used to treat mounds in two plots (#6 & 19) using the disc with a 1/4 inch hole in the cap and counting up to 8 while sprinkling granules on and around the mounds. We found this device to be quick and easy to use.

**Table 1.** Number of active red imported fire ant mounds of ten following 16 May 1995 application of dust treatments using Ortho® Ant-Stop® Orthene® Fire Ant Killer (acephate 75% WP), two additional acephate 75% WP formulations (SF-18881, NB# 568530 and SF-18898, NB# 5608530) or Tempo® 0.1% Dust (cyfluthrin), Trial 1, Burleson Co., Texas.

<u>Treatment</u>	<u>3 days</u>	<u>1 week</u>	<u>2 weeks</u>	<u>4 weeks</u>	<u>Satellite</u>	<u>Total</u>
Untreated	9.25 a	7.75 a	7.75 a	5.25 a	2.50 a	7.75 a
Orthene®	0.00 c	0.00 c	0.25 c	0.25 b	0.00 a	0.25 b
SF-18881	0.25 c	0.00 c	0.00 c	1.25 b	1.25 a	2.50 ab
SF-18898 2	0.75 c	0.50 c	0.00 c	0.50 b	1.75 a	2.25 ab
Tempo®	5.75 b	4.75 b	2.50 b	1.00 b	4.25 a	5.25 ab
<i>F</i>	21.54	52.30	65.33	4.71	1.37	2.47
<i>P</i>	0.0001	0.0001	0.0001	0.0094	0.3023	0.0811
<i>MSE</i>	1.8500	0.5417	0.3917	2.0583	4.9583	8.5000
<i>Min.</i>						
sig diff.	3.0656	1.6588	1.4106	3.2337	5.0188	6.5712
Critical value = 4.508						
d.f. = 12						

**Table 2.** Number of active red imported fire ant mounds of ten following application of individual mound treatments, Burleson Co., Texas, treated 26 September 1995.

<u>Treatment</u>	<u>Mean no. active fire ant mounds/10*</u>					
	<u>3 day</u>	<u>7 day</u>	<u>14 day</u>	<u>30 days</u>		
				<u>30 day</u>	<u>satellite</u>	<u>sum</u>
Orthene®	0.00b	0.00b	0.00b	0.00b	1.50	1.75b
SF 18881	0.25b	0.00b	0.00b	0.00b	1.00	1.00b
SF 18898	0.50b	0.00b	0.00b	0.25b	3.00	3.25b
Velocity®	0.00b	0.00b	0.00b	0.00b	2.50	2.50b
untreated control	9.50a	9.50a	7.50a	7.50a	3.25	10.75a
<i>F</i>	183.5	619.29	58.6	73.05	1.07	12.48
<i>P</i>	0.0001	0.0001	0.0001	0.0001	0.4360	0.0001
MSE	0.2167	0.0667	0.4333	0.3417	3.8830	3.0250
MSD	1.0491	0.5819	1.4836	1.3174	4.4414	3.9200
df=12						
crit.=4.508						

\* Means in columns followed by the same letter are not significantly different using analysis of variance (ANOVA) and means were separated using Tukey's Studentized Range Test ( $P \leq 0.05$ ).