

**Rate Test of Spinosad-based Broadcast Bait for the Suppression of
Red Imported Fire Ants in Large Plots
Brazos, Co., Texas - 1997-1998**

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Spinosad, manufactured by Dow AgroSciences, is a bacterially-derived metabolite that is effective in very low concentrations and has been shown to control a wide variety of insects. This test was designed to test the efficacy of 0.015% spinosad formulated as a conventional, soybean oil-based broadcast bait at varying application rates on large plots in an unimproved pasture. To utilize the available space and common treatments, other broadcast bait treatments were included in this trial. Those results are reported separately (see Evaluation of Skip Swath and Hopper Blend Applications of Extinguish™ for Red Imported Fire Ant Control).

Materials and Methods

The test site was located approximately eight miles east of Bryan, Texas in Brazos County. Applications were made to an ungrazed pasture consisting of heavy clay soil. The area was just emerging from a record-breaking drought during the summer of 1998. Though the pasture was very rough due to large, visible fire ant mounds, most of the mounds were unoccupied by ant colonies. Those that were, usually contained rather small colonies nesting on only a portion of the mound structure.

Square plots, 210 x 210 feet (approx. one acre) were laid out in an irregular pattern following fence lines and the shape of the pasture. Plots were established with adjoining boundaries. A 0.25 acre circular sampling area was established in the center of each plot using 3/8" reinforcing rod as a permanent center marker which allowed for a treated buffer of at least 45 feet between a sampling area and the nearest plot border.

Active mound numbers were determined on 9 October 1998 using the minimal disturbance technique. Plots with a suitable number of mounds were arrayed from highest to lowest and divided into four equal groups (replications). Treatments were assigned within replications so that the total number of mounds for each treatment (total of four replications) were as equal as possible. Treatments were applied 13-14 October using a Red Ball® seeder mounted on a John Deere 4x6 'Gator utility vehicle. Weather during application was mild and sunny and ants were actively foraging.

Post treatment evaluations were made on 28 October, 11 November and 14 December 1998 and 1 April 1999. Evaluations were made using the minimal disturbance technique. In late March we were notified that the site had been sold to the poultry farm adjacent to the property and was to be used for litter disposal. Within two weeks of the final evaluation, the land was plowed and the site had to be abandoned.

Treatments for this portion of the test included:

<u>Treatment</u>	<u>Rate</u>	<u>Application</u>
untreated control	–	–
spinosad (0.015%)	1.5 lbs/acre	full broadcast coverage
spinosad (0.015%)	3.0 lbs/acre	full broadcast coverage
spinosad (0.015%)	5.0 lbs/acre	full broadcast coverage
Amdro® (0.75 hydramethylnon)	1.5 lbs/acre	full broadcast coverage

Results

Mean number of active mounds in 0.25 ac. circle, 4 replications

<u>Treatment</u>	<u>pre-count</u>	<u>2 weeks</u>	<u>4 weeks</u>	<u>8 weeks</u>	<u>24 weeks</u>
untreated	15.75 a	26.75 a	24.50 a	27.25 a	19.25 a
spinosad 1.5	16.00 a	12.25 b	10.25 b	10.00 b	5.75 b
spinosad 3.0	15.75 a	9.25 b	6.50 b	6.50 b	4.00 b
spinosad 5.0	15.75 a	4.50 b	5.00 b	4.25 b	2.75 b
Amdro® full	15.75 a	6.75 b	6.75 b	5.75 b	2.25 b
F	18.05	10.09	12.15	18.36	7.32
probability	0.0001	0.0003	0.0001	0.0001	0.0015
R ²	0.9133	0.8548	0.8764	0.9146	0.8103
Min. sig. diff.	5.8844	11.823	10.416	9.3449	10.159

Means in the same column followed by different letters are significantly different ($P < 0.05$) using PC SAS ANOVA and Tukey's studentized range test for mean separations.

Discussion

All treatments significantly ($P < 0.05$) reduced active mound numbers by two weeks post treatment versus untreated controls. This suppression continued through 24 weeks post-treatment. There were no statistical differences between bait treatments. The spinosad bait, applied at 1.5, 3.0 and 5.0 lbs./acre showed a consistent numerical rate response, however, with the 5.0 lbs/acre rate performing better than the other two. The 5.0 lbs/acre rate of spinosad also showed slightly greater control than Amdro for most of the test. For practical purposes, maximum control was achieved within two weeks of application. This was somewhat faster than is normally expected of a broadcast bait and is probably the result of the small, summer-weakened colonies retrieving a high percentage of the bait and it being shared among fewer worker ants than normal. Unfortunately, because the test site was sold and plowed only six months after application, no conclusions can be drawn regarding the duration of control of any of the treatments.