

Control of Individual Colonies of Red Imported Fire Ants with a Drench of the Bacteria *Xenorhabdus* spp.

Navasota, Texas Municipal Airport - 1999

Charles L. Barr - Extension Program Specialist, Fire Ant Project

Rody L. Best - Extension Assistant, Fire Ant Project

Biological insecticides are becoming more popular as people seek alternatives to synthetic chemicals. This field trial was conducted to test the effectiveness of a broth of *Xenorhabdus* spp. bacteria for the control of individual red imported fire ant colonies (*Solenopsis invicta* Buren). The test was designed to test not only colony mortality, but to help detect whether the product caused colonies to relocate and/or shatter into multiple colonies.

Objective: Test the effectiveness of a broth of *Xenorhabdus* spp. bacteria for the control of individual colonies of fire ants.

Materials and Methods

The test site was the Navasota Municipal Airport, Grimes County, Texas. Most fire ant mounds were located in the 20-foot mowed strip adjacent to the runway. The test was established and treated on July 30, 1999. The standard “railroad track” design was used as outlined in Barr et al (2002). Plots were 30 feet wide and of variable length to encompass 10 active mounds each. Ant activity was evaluated using the minimal disturbance technique. Criteria used to consider a mound “active” varied with weather, time of day, activity of untreated mounds and the best judgement of the evaluator. Generally, a mound was considered active if 10-20 ants rose to the surface in a defensive manner within 15 seconds of disturbance.

Evaluations were made on August 3, 6, 13 and 27. Plots were surveyed for “new” (reinvading and/or relocated) mounds on August 6 and 27. The “total” number of mounds reported in the table is the number of active treated mounds + “new” mounds.

Treatments included: *Xenorhabdus* broth, 1 quart per mound; TB131-1, a formulation of the fungus *Beauveria bassiana*, applied at 0.5 oz/mound; Organic Resources®, 0.1% pyrethrin, 83.3% diatomaceous earth, 0.1% piperonyl butoxide, applied at 4 tablespoons per gallon of water per mound and; untreated control.

All data were analyzed using PC SAS analysis of variance procedures with means separated using Tukey’s studentized range (HSD) test, $P < 0.05$.

Results and Discussion

As shown in **Table 1**, the *Xenorhabdus* mound drench significantly ($P < 0.05$) reduced the total number of active mounds per plot compared to untreated controls one month post-treatment. The treatment did not appear to cause colony relocation or shattering. However, its control of treated mounds was only about 50% and similar to that of the commercial *Beauveria* treatment. By comparison, the Organic Resources treatment gave 100% control of treated mounds from three days post-treatment through the end of the test.

Table 1. Results of red imported fire ant mound evaluations, 10 treated, 4 replications; Navasota Airport, Texas. Treated July 30, 1999.

Treatment	Day 3 treated	Mean number of active mounds						
		treated	1 week new	total	2 weeks treated	treated	1 month new	total
untreated	8.25 a	8.25 a	1.25 a	9.50 a	8.00 a	8.25 a	1.00 a	9.25 a
Xenorhab.	6.75 a	7.25 a	0.50 a	7.75 a	5.25 ab	5.00 b	0.00 a	5.00 b
TB131-1	7.25 a	6.75 a	0.50 a	7.25 a	5.00 b	4.25 b	0.75 a	5.00 b
Org. Res.	0.00 b	0.00 b	1.00 a	1.00 b	0.00 c	0.00 c	0.50 a	0.50 c
F	13.06	17.61	1.59	14.38	13.14	21.88	1.43	19.74
P	0.0005	0.0002	0.2544	0.0004	0.0005	0.0001	0.3017	0.0001
R ²	0.8970	0.9215	0.5150	0.9055	0.8976	0.9358	0.4882	0.9293
MSD	3.2545	2.8557	1.6556	3.2284	2.9027	2.3558	1.4831	2.6594

Means in the same column followed by different letters are significantly different ($P < 0.05$) using PC SAS analysis of variance procedure with means separated using Tukey's studentized range (HSD) test. $df = 9$.

Literature Cited

Barr, CL and RL Best. 2002. Product evaluations, field research and new products resulting from applied research. SW Ento. Supplement 25:47-52