

Assessment of Esteem® (pyriproxyfen) Fire Ant Bait Plus Dry Fertilizer Application to a Hay Pasture

Mike Heimer, Paul Nester, Alejandro Calixto, Bart M. Drees
Texas AgriLife Extension Service, Texas A&M System

Various techniques can improve the cost-effectiveness of broadcast applications of red imported fire ant, *Solenbopsis invicta* Buren (Hymenoptera: Formicidae), bait-formulated products to hay pastures, including: 1) saving a trip across the field by applying the ant bait blended in dry fertilizer; 2) blending a faster-acting bait product such as one containing hydramethylnon with a slower-acting but longer-acting insect growth regulator (IGR) such as pyriproxyfen. This trial was conducted to assess the performance of these methods compared to a “standard” treatment containing the IGR methoprene.

Materials and Methods

This trial was conducted in an improved hay pasture owned by Mr. Dutton. The trial was located outside of Dacus, TX. On Oct. 6, 2008, five non-replicated plots each roughly 5-acres in size were established (**Fig. 1**). Within each, four sub-plots were marked with GPS and the number of active red imported fire ant mounds was counted within a 58 ft radius, 0.25-acre circular area using the minimal disturbance method whereby an ant mound was considered active if more than a dozen ants emerged upon disturbance.

Treatments evaluated in this trial included: 1) untreated control; 2) 2.0 lb/A Esteem®, containing the Insect Growth Regulator (IGR) pyriproxyfen; 3) 2.0 lb/A Esteem® plus dry fertilizer; 4) 1.0 lb/A Esteem® plus 0.75 lb/A Amdro® Pro as a “hopper blend”; and 5) 1.5 lb/A Extinguish® Plus, containing the IGR methoprene. Esteem® plus fertilizer and fertilizer only treatments were applied using an dry fertilizer spreader mounted on a tractor (**Fig. 2**). All ant bait products were applied using a Herd GT-77 Seeder mounted on an all terrain vehicle (ATV) (**Fig. 3**). Active ant mounds per sub-plot were assessed on Nov. 24, 2008 and May 26, 2009. Average (mean) and standard deviation (S.D.) were calculated for each treatment and graphed.

Results and Discussion

Because of the non-replicated design of this trial and differences in pre-treatment plot means, statistical analysis of results were not be performed, and only raw data, mean numbers of active red imported fire ant mounds and standard deviations (S.D.) for plot are provided (**Table 1**). Eight weeks after treatment (November 24), active ant mound numbers in all ant bait treated plots had begun to be reduced from pre-treatment levels (**Fig. 3**). The addition of a faster-acting bait generally such as hydramethylnon (Amdro® Pro) can increase the rate of active mound reduction, producing noticeable results in 3 to 6 weeks after treatments. However, this effect was not documented in this trial. The Esteem® broadcast treatment, either applied alone or blended with dry fertilizer seemed to perform similarly. With IGR products, fall applications generally provide maximum

effects by the following spring or early summer. On May 26, 2009, forage grass was high and to be cut in the coming days or weeks, possibly reducing the number of active ant mounds in the untreated plot. Dry spring conditions may also have contributed to low counts. Regardless, broadcast bait treated plots had numerically fewer active ant mound means than did the untreated plot, indicating that the effects of the fall application continued through the spring cutting.

2009 Esteem 24(c) for Skip Swath and Hopper: Based on our previous applied research efforts, data supporting the application of the insect growth regulator Esteem® (pyriproxyfen) Ant Bait both as a "hopper blend" and "skip swath" treatment to pasture and rangeland (available on request) , has supported Valent U.S.A. to be issued state special use label (24(c)) by the Texas Department of Agriculture (available on request). This product joins Amdro Pro (hydramethylnon) and Extinguish (methoprene) as having a "hopper blend" label, in addition to the Extinguish Plus (hydramethylnon plus methoprene) pre-blended product, all also resulting from our applied research efforts. These "hopper blends", using half rates of each product mixed together, maximize both earliness and long-lasting effects of red imported fire ant treatment by combining a faster acting ingredient such as hydramethylnon (maximum control in 3 to 6 weeks following application) with an insect growth regulator that prevent worker ant production by affected queens for months following application. This performance profile resulting is often superior to either product applied alone at the same cost. The extended duration between needed treatments cuts treatment costs on an annual basis when the number of multiple applications are reduced. However, the "skip swath" treatment is a first for Texas and the nation. This treatment uses the conventional broadcast application rate (2 lbs/acre for Esteem Ant Bait), but applies it to every other 25 ft swath, thereby using half the material and half the application time. This effectively cuts the treatment cost in half. The lower application cost may encourage producers to adopt this technology where the cost of a full broadcast application may not be justified by losses. This development of this application method has taken years to come to fruition. The goal was set by earlier surveys of Texas veterinarians and cattle producers (results posted on <http://fireant.tamu.edu> under research/result demonstrations) indicating their desire to have a reduced cost treatment. The Texs AgriLife Extension Service, working in collaboration with Valent U.S.A., has now achieved this goal with the approval of this 24(c) labels by the Texas Department of Agriculture **Appendix 1.**



Figure 1. Field plot and sub-plot locations for a field trial assessing Esteem® Fire Ant Bait plus dry fertilizer treatment, Montgomery Co., TX, 2008.



Figure 2. Esteem® Fire Ant Bait (pyriproxyfen) blended with dry granular fertilizer application being broadcast-applied, Montgomery Co., TX 2008.



Figure 3. Blending Esteem® Fire Ant Bait (pyriproxyfen) with Amdro®Pro (hydramethylnon) to create the “hopper blend” for broadcast application to experimental plots in a hay pasture, Montgomery Co., TX 2008.

Figure 3. Mean number of active red imported fire ant mounds per treatment plot in hay pasture, Montgomery Co., TX, treated Oct. 6, 2008.

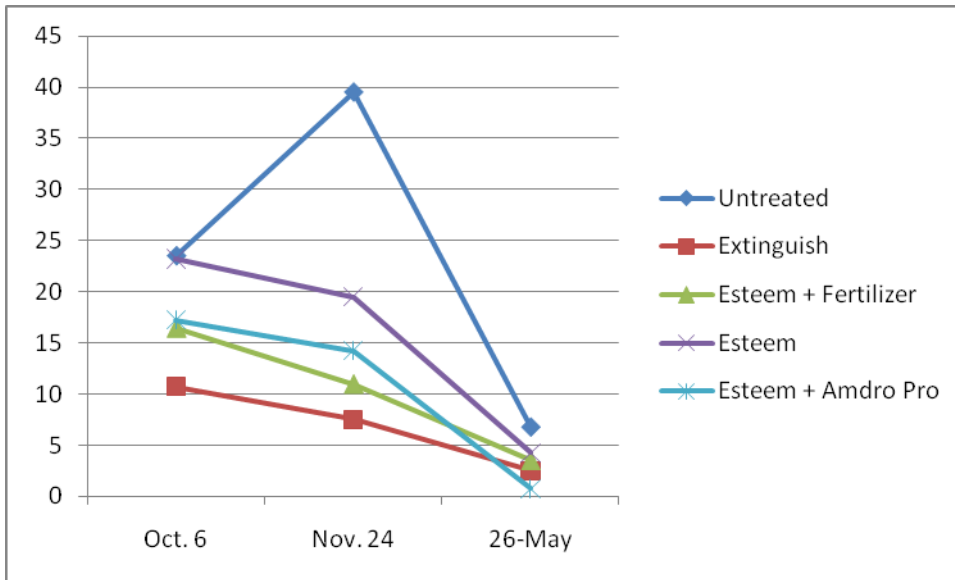


Table 1. Raw sub-plot data, mean and standard deviation (SD) of active red imported fire ant mounds per treatment plot in hay pasture, Montgomery Co., TX, treated Oct. 6, 2008.

<u>Treatment</u>	<u>Subplot</u> <u>No.</u>	<u># Active RIFA Mounds</u>		
		<u>10/6/2008</u>	<u>11/24/2008</u>	<u>5/26/2009</u>
untreated	1	14	11	6
	2	16	19	6
	15	52	100	14
	20	12	28	1
mean		23.5	39.50	6.75
S.D.		19.07005	40.93	5.377
Extinguish®	3	7	6	1
	4	6	7	2
	5	18	10	5
	6	12	7	2
Mean		10.75	7.50	2.50
S.D.		5.5	1.73	1.73
Esteem® + dry fertilizer	7	18	10	4
	8	8	6	1
	9	27	18	5
	10	13	10	4
Mean		16.5	11.00	3.50
S.D.		8.103497	5.03	1.73
Esteem® Ant Bait	11	14	11	7
	12	12	16	6
	13	38	26	2
	14	29	25	2
Mean		23.25	19.50	4.25
S.D.		12.41974	7.23	2.63
Esteem® + Amdro® Pro	16	14	4	0
	17	6	5	0
	18	41	38	3
	19	8	10	0
Mean		17.25	14.25	0.75
S.D.		16.19413	16.05	1.50

Appendix 1. Esteem® Ant Bait 24© label for use of “hopper blend and skip swath” applications.

FIFRA Section 24(c) Special Local Need



FOR DISTRIBUTION AND USE ONLY WITHIN THE STATE OF TEXAS



FOR SKIP-SWATH AND HOPPER-BLEND TREATMENTS TO PASTURELAND

EPA Reg. No. 59639-138
EPA SLN No. TX-09006

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

Active Ingredient	By Wt.
*Pyriproxyfen	0.50%
Other Ingredients	99.50%
Total	100.00%
*2-[1-methyl-2-(4-phenoxyphenoxy) ethoxy] pyridine	

GENERAL INSTRUCTIONS

CROPS	PESTS	PRODUCT RATES/A	SPECIAL INSTRUCTIONS
Pastures & Rangeland	Imported Fire Ant Native Fire Ant Red Imported Fire Ant Southern (California) Fire Ant	1.5 – 2.0 lb	BROADCAST APPLICATION: Broadcast uniformly with suitable ground or aerial equipment calibrated to give the correct dosage.
		0.75 – 2.0 lb	HOPPER BLEND: To make Esteem Ant Bait reduce ant populations more quickly, apply broadcast as a "hopper blend" with a rate range of 0.75 to 2.0 lb of <i>Esteem</i> Ant Bait with a half broadcast rate of a contact bait (such as a product containing hydramethylnon) also registered for use in pastures and rangelands. Thoroughly mix bait products together and apply uniformly using appropriate ground or aerial equipment. Use of higher rates of <i>Esteem</i> Ant Bait in hopper blends typically provides longer residual control.

CROPS	PESTS	PRODUCT RATES/A	SPECIAL INSTRUCTIONS
	Imported Fire Ant Native Fire Ant Red Imported Fire Ant Southern (California) Fire Ant	1.0 lb	SKIP SWATH: For suppression only, particularly of multiple queen forms of imported fire ants, apply as a "skip swath" treatment using suitable ground application equipment such as a Herd GT-77 model seeder to apply the full rate (2.0 lb/A) to every other swath, thereby applying 1.0 lb per acre.
<p><i>Esteem</i> Ant Bait may be mixed and/or alternated with commonly used insecticides to comply with local IPM programs and resistance management programs.</p> <ul style="list-style-type: none"> • Apply <i>Esteem</i> Ant Bait when ants are actively foraging, usually when the soil temperature is above 60°F. • Avoid application if rain is expected within 4 to 6 hours. • A second application of <i>Esteem</i> Ant Bait may be advisable after 12 to 16 weeks in areas of heavy infestations, or when reinfestation occurs. • Do not make more than two <i>Esteem</i> Ant Bait applications per growing season. • Do not exceed 4 lb of <i>Esteem</i> Ant Bait per acre per season. 			

This label and the EPA-registered label must be in the possession of the user at the time of mixing and pesticide application.

Follow application directions, restrictions, Worker Protection Standards requirements and precautions on the EPA-registered label.

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FIFRA Section 24(c) Registrant: Valent U.S.A. Corporation
 P.O. Box 8025
 Walnut Creek, CA 94596-8025

Esteem® is a registered trademark of Valent U.S.A. Corporation.