



## Evaluation of Reduced Rates of Talstar and BotaniGard 22WP Together for Fire Ant Control in Nursery Pots

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**Nature of Work:** In 2001, reduced rates of Talstar (bifenthrin 0.2 G, FMC, Philadelphia, PA) were tested together with BotaniGard 22WP (*Beauveria bassiana* in wettable powder, GHA strain, Mycotech Corporation, Butte, MT) for red imported fire ant, *Solenopsis invicta* Buren, control in potted nursery soil. The reduced rates of Talstar plus BotaniGard treatments were better at eliminating fire ants from pots than the standard rate of Talstar alone. The objectives of this current study were to test a much lower rate of BotaniGard 22WP with the rates of Talstar that were used in 2001 and to determine efficacy and cost savings from use of these lower rates.

Fire ant colonies were collected from Spalding County, GA and were maintained in the laboratory until addition of workers to nursery containers. Treatments were an untreated control, standard rate of Talstar, 1/2 rate of Talstar plus BotaniGard at  $2.44 \times 10^{14}$  *B. bassiana* conidia per  $m^3$  soil, 1/2 rate of Talstar plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$ , and 1/4 rate of Talstar plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$ . Each of the treatments was mixed with soil prior to potting in 3.37-liter containers on 10 May. All containers were placed in an open area exposed to full sun in the University of Georgia Research and Education Garden on the College of Agricultural and Environmental Sciences Griffin Campus. There were four containers per treatment in each block. Blocks were replicated four times in a RCBD for a total of 16 containers per treatment. An average (mean  $\pm$  SE) of  $116 \pm 6$  worker ants was added to each pot on 13 May. Containers were then inspected daily for the presence of live fire ants. Containers were checked by lightly tapping a pot and visually inspecting the soil surface and inside of the pot for live fire ants. A pot was considered infested if there was one or more live fire ants inside the pot. Addition of live ants to uninfested containers was repeated every 7 d until 03 June. The number of infested pots in each replication was transformed by square root ( $x + 0.5$ ) before analysis with ANOVA by sampling date. Separation of means was done with LSD tests in SAS.

**Results and Discussion:** Live fire ants were observed in containers treated with 1/4 rate of Talstar plus *B. bassiana* at  $2.78 \times 10^{12}$  conidia per  $m^3$  over a longer period (each time ants were added to pots) compared with the other treatments. However, all treatments effectively eliminated fire ants from pots within 72 h following addition of ants (Fig. 1). In the first two weeks of the study, fire ants were not found in any containers treated with the standard rate of Talstar, 1/2 rate of Talstar plus *B. bassiana* at  $2.44 \times 10^{14}$  conidia per  $m^3$ , or 1/2 rate of Talstar plus *B. bassiana* at  $2.78 \times 10^{12}$  conidia per  $m^3$  the day following addition of ants. All treated and untreated containers were devoid of live fire ants 48 h following addition of ants in the third and fourth week of the study. This was probably due to high day-time temperatures, which may have caused ants to evacuate pots.

**Significance to Industry:** Use of lower rates of Talstar in combination with *B. bassiana* against fire ants in potted nursery soil may provide monetary savings for nursery managers. Cost analysis was done comparing current prices for the reduced rates of Talstar plus BotaniGard with the standard rate of Talstar only (Table 1). There was no financial savings for the high rate ( $2.44 \times 10^{14}$  conidia per  $m^3$  soil) of BotaniGard plus the 1/2 rate of Talstar when compared with the standard rate of Talstar only. Talstar at 1/4 rate plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$  soil costs 40% less than the standard rate of Talstar only. Use of 1/2 rate of Talstar plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$  soil cost 15% less than the standard rate of Talstar only. Although this combination treatment costs more to implement than the 1/4 rate of Talstar plus the low rate of BotaniGard treatment, it provided quicker elimination of fire ants from containers. Labor was not included in calculation of costs, but the additional effort required to prepare the two products for mixture with soil was minimal. Also, it would be difficult to determine the financial benefits from reduced exposure of nursery workers to insecticide active ingredient. However, improved worker safety would be another positive aspect associated with use of the combination treatments.

Table 1. Cost comparison for treatments of Talstar 0.2 G and BotaniGard 22WP (*B. bassiana*) used in nursery container study, 2002

	Amount used to treat $m^3$ of soil	Cost to treat $m^3$ of soil <sup>a</sup>
Talstar	1.18 kg (standard rate)	\$1.98
	0.59 kg	\$0.99
	0.29 kg	\$0.49
BotaniGard 22 WP	0.0066 kg ( $2.78 \times 10^{12}$ conidia)	\$0.70
Combination	0.59 kg Talstar plus 0.0066 kg BotaniGard 22 WP	\$1.69
	0.29 kg Talstar plus 0.0066 kg BotaniGard 22 WP	\$1.19

<sup>a</sup>Based on \$38.00 for 22.68 kg (50 lb) of Talstar and \$48.00 for 0.45 kg (1 lb) of BotaniGard 22 WP

**Figure 1.** Mean percentage of nursery pots with fire ant activity following treatment with (1) nothing (untreated), (2) standard rate of Talstar 0.2 G, (3) 1/2 rate of Talstar plus BotaniGard 22 WP at  $2.44 \times 10^{14}$  *B. bassiana* conidia per  $m^3$  soil, (4) 1/2 rate of Talstar plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$  soil, (5) 1/4 rate of Talstar plus BotaniGard at  $2.78 \times 10^{12}$  conidia per  $m^3$  soil. Bars with the same letter within a graph are not significantly different [ $P > 0.05$ ; LSD mean separation;  $df = 3, 4$ ; \*,  $P < 0.05$ ; \*\*\*,  $P < 0.001$ ].

