



Evaluation of *Beauveria bassiana* and Reduced Rates of Talstar for Fire Ant Control in Nursery Pots

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Nature of Work:

In previous studies, the fungus *Beauveria bassiana* was shown to kill red imported fire ants, *Solenopsis invicta* Buren, but the emulsifiable suspension (BotaniGard ES) and wetttable powder (BotaniGard 22WP) formulations did not totally eliminate the pest from treated nursery pots. The WP formulation was more persistent in potted soil than ES. In 1999, Talstar (bifenthrin) totally eliminated fire ants from containers within 2 days following addition of ants. In 2000, Talstar provided better fire ant control than ES or WP, but did not totally eliminate fire ants from pots either. The objective of this study was to combine WP with reduced rates of Talstar and test them together for fire ant control in nursery plant containers.

Treatments that were tested were untreated controls, Talstar at the standard rate (2 lbs per cubic yard of soil), ½ the standard rate of Talstar plus WP (at a rate of 0.92 lbs WP per cubic yard of soil), and ¼ rate of Talstar plus WP (at 0.92 lbs WP per cubic yard of soil). Each of the treatments was mixed with soil prior to potting in 3 gallon containers. There were four containers per treatment in each block. Blocks were replicated five times in a RCBD for a total of 20 pots per treatment. On 28 March 2001, an average of 116 fire ant workers were added to each pot. Containers were then checked daily for presence of live fire ants. This test differed from tests conducted in 1999 and 2000 in that, following death of all ants in treated pots, the process of adding live ants to containers was repeated every 7 days until 09 July. Ants were not added to containers that already contained live ants. One day after addition of workers, dead individuals were picked from the soil surface of pots treated with Talstar ½ rate plus WP and the Talstar ¼ rate plus WP. These ants were washed, rinsed, and plated on nutrient agar. They were then incubated and monitored for external growth of *B. bassiana*. The number of days on which fire ants were observed in pots was pooled to provide 25 total sampling days and transformed by square root ($x + 0.5$) prior to analysis by ANOVA.

Results and Discussion:

Live fire ants were observed in untreated containers on significantly ($F = 301.99$; $df = 3, 12$; $P = 0.0001$) more sampling days compared to treated pots (Figure 1). Fire ants were eliminated from pots treated with Talstar ½ rate plus WP and Talstar ¼ rate plus WP within 2 days each time ants were added to containers. Both the Talstar ½ rate plus WP and Talstar ¼ rate plus WP treatments performed better than the standard rate of Talstar by itself. Ants were added to containers on 04 June and on 05 June live worker ants were observed in only one pot that was treated with Talstar ½ rate plus WP. No live fire ants were observed in pots treated with Talstar ½ rate plus WP on the other six dates immediately following

addition of ants. On the first two collection dates, external growth of *B. bassiana* developed on 4.4–28.6% of dead ants taken from containers treated with Talstar $\frac{1}{2}$ rate plus WP and Talstar $\frac{1}{4}$ rate plus WP. On subsequent collection dates, none of the dead ants developed external growth of the fungus.

Significance to Industry:

Combining *B. bassiana* formulated as a wettable powder with reduced rates of Talstar proved effective for quickly eliminating fire ants from nursery pots throughout the study. Although the $\frac{1}{2}$ rate of Talstar + WP performed slightly better than Talstar $\frac{1}{4}$ rate + WP, the results for Talstar $\frac{1}{4}$ rate + WP may be adequate for efficacious fire ant control in nursery pots. Use of lower rates of insecticide may improve worker safety conditions and may result in savings in expenditures for chemicals. A comparison in the cost of added WP versus savings due to lower usage of Talstar has not yet been done.