Product Testing for the Treatment of Argentine Ants (*Linepithema humile*) in Southern California

by

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ABSTRACT

To control the Argentine ant, *Linepithema humile* Mayr, the effectiveness of three chemical products applied around structures in southern California was evaluated. Three products were tested and included: Demand® CS (lambda-cyhalothrin, Syngenta), Termidor® SC (fipronil, BASF), and Transport™ GHP (bifenthrin and acetamiprid, FMC Corp.). A licensed pest management professional applied each product per label instructions to four buildings. In addition, four untreated checks were included in the study. Post treatment inspections were completed at 3, 14, 28, and 56-days. At 56 days post treatment, the percentage control for each treatment was: Demand® CS 94.05%; Termidor® 93.55%, and Transport™ GHP 98.96%. In all cases, except the untreated checks, surveyed homeowners reported a reduction in ants found in their homes at 90 days post-treatment.

Keywords: Demand® CS, Termidor® SC, Transport™ GHP, Argentine Ant control, bifenthrin, acetamiprid, lambda-cyhalothrin, fipronil, *Linepithema humile.*

INTRODUCTION

Argentine ants, *Linepithema humile* Mayr, are a significant structural pest along the West Coast of California. This ant ranks as one of the most important pest challenges to the structural pest control industry (Choe and Rust 2008). Rust and Reierson *et al.* (1998) have determined in studies that Argentine ant populations in southern California can average at least 0.5 million ant visits daily to bait stations.

Past control measures featured the exclusive spraying of interior baseboards and have been replaced by crack and crevice treatments. However,

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current control measures include exterior perimeter sprays such as Termidor® (fipronil), Talstar® (bifenthrin), and liquid baits containing thiamethoxam as the toxicant (Rust and Reierson *et al*. 1998).

METHODS & MATERIALS

Field trials were conducted by the University of California, Berkeley during late summer 2008 in order to compare perimeter spray treatments for the control of Argentine ants. Three sprays were compared: Demand® CS Insecticide (Syngenta, Wilmington, DE), Termidor® SC Termiticide/Insecticide (BASF, Research Triangle Park, NC), and Transport® GHP Insecticide (FMC, Philadelphia, PA). All were applied according to label directions by a State licensed pest management professional (Newport Exterminating, Newport Beach, CA).

We purposely chose a trial location in which the structures were similar in construction style and age (Fig. 1). Each structure was a townhouse that contained four units, each with its own landscaping. Four townhouse structures were used for each treatment (four treatments, each replicated four times). Eight structures along one street within the complex were used for the untreated controls and Demand® CS treatments with an untreated parking lot separating the two treatments. Eight structures on a second street were used for Termidor® SC and Transport™ GHP treatments with one untreated building separating the two treatments. A perimeter band was applied three feet up and 10 feet out from the buildings at the rate of 1 water-soluble bag (0.3 ounces of product) per 1,000 square feet for Transport™ GHP and at a

Fig. 1. Irvine Townhome Development, Irvine, CA (Aerial and close up views).

rate of 0.4 fluid ounces of product per 1,000 square feet for Demand® CS. Termidor® SC was applied at the rate of 0.8 fluid ounces of product per 1,000 square feet as a band that was one foot up and one foot out around the structures. All chemical applications were conducted using a hand-held compressed air sprayer. Chemical was also applied to visible foraging trails around the treated structures. Untreated control structures were not treated with any materials but their ant foraging numbers were counted. For all chemical applications, approximately two finished gallons per 1,000 square feet were used to complete the perimeter barriers.

The foraging numbers of ants were counted pre- and post-treatment. Post-treatment evaluations were at 3, 14, 28, and 56 days. Each structure was divided into four quadrants and trails were delineated for each quadrant. The number of ants counted in each trail was determined by first observing the foraging ants to determine the direction of their nest. For pre-treatment counts, a single point on the trail was observed for three 30-sec counts and each ant traveling toward the nest was counted. The same foraging count method was used for each post-treatment inspection date. The mean forager ant count per building per visit was compared using a repeated measures analyses of variance statistical method (SAS 2005).

RESULTS & DISCUSSION

The pattern of ant control with Demand® CS and Transport™ GHP was similar over the eight week period (Table 1). Demand® CS decreased the

Table 1. Mean ant count plus standard errors pre-treatment and post-treatment.

Inspection Day	Untreated Control	Demand® CS	Termidor	Transport™ GHP
0	24.50 ± 3.54	17.84 ± 4.32	16.97 ± 8.27	33.09 ± 4.48
3	39.06 ± 4.84	0.13 ± 0.051	4.41 ± 1.05	1.84 ± 1.76
14	9.78 ± 1.99	0.41 ± 0.41	3.22 ± 2.26	0.91 ± 0.83
28	55.72 ± 10.40	1.66 ± 1.29	6.50 ± 5.21	1.41 ± 0.88
56*	55.28 ± 2.35b	1.06 ± 0.26a	1.09 ± 0.18a	0.34 ± 0.18a

*For the 56-day inspection, row means followed by the same letter were not statistically different ($P > 0.05$ repeated measures analysis, SAS 2005).

populations 90% to 99%, and Transport™ GHP decreased ant populations 94% to 99% over the trial. Termidor® SC was somewhat slower in achieving ant control, but still achieved 93% at the final inspection date.

We had hoped to conduct a 90 day post-treatment ant count, but heavy rains limited further field evaluations. Instead, upon returning at 90 days, we interviewed homeowners about their satisfaction with the treatments and their perceived effect on indoor ant populations. Prior to conducting this research, indoor ant complaints by homeowners were consistently high; however during our survey all homeowners for all treated structures reported a "significant" decrease in indoor ant populations. Forager ant numbers were statistically lower among treatments when compared to untreated checks (Table 1). However, there was no statistical difference in performance among active ingredients/products.

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