(J5)

MULTI-FAMILY DWELLINGS:

German cockroach: Blattella germanica (L.)

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RELATIVE EFFICACY OF FIPRONIL EC FOR GERMAN COCKROACH CONTROL, 1998: The residual effectiveness of fipronil EC (supplied by Rhône Poulenc AG Co., Research Triangle Park, NC) applied as crack_ and crevice/spot treatment was evaluated for German cockroach control. Test insect was the susceptible 'Jwax' strain of Blattella germanica (L.), obtained from a laboratory culture. Three fipronil concentrations were evaluated and compared to Demon® EC at 1 oz/gallon and a check. Treatments were applied into cracks and crevices of kitchen cabinets (38.1 cm x 38.1 cm x 76.2 cm) with a B & G sprayer equipped with a 'crack and crevice' nozzle tip. Treated cabinets were held in individual mock-kitchen chambers (304.8 cm x 182.9 cm x 266.7 cm) (outside dimensions) by treatment. Kitchen chambers are located in the sub-basement of Whistler Agricultural Research Building, Purdue University. Two cabinets were assigned to each treatment, and about 100 ml of formulated material was applied for each treatment. Check cabinets did not receive any insecticide treatment. All cabinets were provisioned with food, water and harborages. Residual effectiveness of treatments was evaluated at 2, 5, 7, 14, 28, 42, and 56 d after treatment. At each post-treatment period, 500 cockroaches including 200 males, 200 females and 100 nymphs (4^{th} and 5^{th} instars) were introduced into each kitchen. After 24 h, dead cockroaches were collected and counted. There were four replicates for the fipronil treatments, and two replicates each for the Demon® EC and untreated control treatments. Percent mortality was calculated from the number of dead cockroaches as a function of number of cockroaches introduced into each kitchen. ANOVA models were used to compare residual effectiveness of treatments at each sampling interval and means were separated with DMRT at $\alpha = 0.05$. A percent kill of >=70% was set as the benchmark for a treatment to be classified as effective.

The percentage mortality in the fipronil EC treatments ranged from 69.4 to 82.9, 61.5 to 76.1 and 58.9 to 66.8 for the 25mg/m^2, 18.75 mg/m^2, and 12.5 mg/m^2, respectively. The range of percent mortality for Demon® EC was 31.4 to 81.5. The mortality of cockroaches in the untreated check did not exceed 12%. With respect to residual effectiveness, the 25 and 18.75 mg/m^2 fipronil treatments were effective for 42 and 14 days, respectively, based on 70% cockroach kill as the benchmark for satisfactory control. The percent kill recorded for the lowest concentration of fipronil (12.5mg/m^2) was never up to 70%. Like the high concentration of fipronil EC, the Demon® EC treatment showed good residual effectiveness for 42 days. It is apparent from this trial that the residual activities of fipronil EC applied as crack and crevice treatment against German cockroaches was concentration dependent. A concentration of 25 mg/m^2 was found to be as effective as 1 oz/gallon of Demon® EC in bringing about cockroach control for up to 42 days post-treatment.

Treatment	Rate	% cumulative mortality						
		2 d	5 d	7 d	14 d	28 d	42 d	56 d
Fipronil EC	25 mg/m^2	79.6a	78.4a	77.3a	82.9a	79.4a	75.6a	69.4a
Fipronil EC	18.75 mg/m^2	72.2a	70.9ab	73.2a	76.1a	69.0a	64.7ab	61.5a
Fipronil EC	12.5mg/m^2	56.4ab	60.5ab	62.5ab	66.8ab	60.8b	61.2b	58.9a
Demon EC[a]	1 oz/gallon	31.4bc	35.6bc	42.1b	58.4b	76.6ab	81.5a	69.7a
Check[a]	—	4.8c	7.6c	7.8c	9.9c	9.4c	11.6c	11.9b

Means in columns followed by the same letter(s) are not significant, DMRT at $\alpha = 0.05$.
[a] n = 2