

RESIDUAL EFFECT OF FIPRONIL SC AGAINST INSECTICIDE RESISTANT POPULATIONS OF THE GERMAN COCKROACH

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Abstract A fipronil SC formulation was evaluated against a multi-resistant population of *Blattella germanica*. The test site was an eight-story apartment building, with 150 individual apartments in Neratovice, Central Bohemia, Czech Republic. Conditions in the apartments included general disorder and an abundance of exposed food. The previous insecticides used in the building for cockroach control included sprays of deltamethrin and encapsulated chlorpyrifos, and imidacloprid baits. Density of cockroach populations was evaluated before and after treatments using 3 sticky traps per apartment. Prior to treatment there was a mean of 137.5 cockroaches per trap. Fipronil SC (26 g fipronil per liter, for 2.6 % concentration) was applied as a water-based spray to exposed surfaces at the rate of 50 ml per square meter. Preliminary evaluation was conducted in 10 apartments. Nine days after application there was an 82% reduction in the *B. germanica* infestation. For the second treatment all the apartments in the building were sprayed, which resulted in a 96.9% reduction after 3 weeks, a 98.9% reduction after 4 weeks, and 95% reduction after 12 weeks.

Cockroaches recovered from sticky traps placed in the apartments were used to establish laboratory colonies of the Neratovice strain of *B. germanica*. These were retained to get sufficient numbers of adults of the F₁-F₃ generation for evaluating levels of insecticide resistance. Resistance was evaluated using the standard test of forced tarsal contact on insecticide-treated, non-porous tile. Insecticide was applied to the tiles at the rate of 44 mg per m² for chlorpyrifos, 11 mg per m² for fipronil, and 5.5 m² for deltamethrin. Results of these evaluations showed high levels of resistance: deltamethrin 50% knockdown in 24 h; chlorpyrifos 21% knockdown in 24 h. A susceptible strain of *B. germanica* (National Institute of Health) exhibited: deltamethrin 50% knockdown in 12.7 minutes; chlorpyrifos 50% knockdown in 147.2 minutes. The fipronil KDT₅₀ for the susceptible strain was 455 minutes and 479 minutes for the Neratovice strain indicating no cross resistance.