

CONTAMINATION of BAIT DEPOSITS and BAITED SUBSTRATES AFFECTS PERFORMANCE of INSECTICIDAL BAITS USED for GERMAN COCKROACH (DICTYOPTERA: BLATTELLIDAE) CONTROL

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Most manufacturers warn applicators to avoid contaminating cockroach baits with conventional aerosol or liquid insecticides. However, at least one study has concluded that small amounts of insecticides do not affect bait performance. In this study we use mint oil, a relatively nontoxic — yet highly repellent — material, as a model to examine the repellent effect of conventional insecticide contamination on baits. The effect of direct contamination of bait deposits and contamination of baited substrates was examined in a series of laboratory experiments. The toxicity of currently available cockroach gel, powder, and solid bait formulations containing a variety of active ingredients (ivermectin, fipronil, hydramethylnon, and imidacloprid) was evaluated against insecticide-susceptible adult male German cockroaches, *Blattella germanica* (L.). Groups of cockroaches were confined in 18 by 31 by 10 cm plastic boxes with food, water, and a small cardboard harborage. An 18 by 18 cm sheet of aluminum foil was placed on the floor of each box and against the narrow side. A ≈ 0.01 g deposit of bait was applied to the center of the foil and mortality recorded daily. Treatments included topical application of 10ml of 4% mint oil coating the entire bait deposit, application of 10ml of mint oil to the entire surface of the foil with and without applied bait, placement of bait deposits in empty Combat® bait stations positioned on both mint oil treated and untreated foil, and treatment of bait station runways with mint oil.

Probit analysis for correlated data was used to estimate LT_{50} values (d); differences among LT_{50} values were based on nonoverlap of the 95% confidence intervals. For all bait formulations, direct contamination with mint oil resulted in significantly greater LT_{50} values compared with uncontaminated bait. For example, uncontaminated MaxForce® gel bait containing fipronil had an LT_{50} of 2.1 d, but the LT_{50} value increased to 8.3 d when contaminated. Similarly, performance of bait deposits in protective stations was degraded when the station was placed on a contaminated substrate; ivermectin solid bait in a bait station had an LT_{50} value of 3.9 d; however, the LT_{50} value increased significantly to 6.1 d when the station was placed on a contaminated substrate. In general, direct contamination of a bait deposit with mint oil resulted in a significant 2-4 fold increase in LT_{50} value. Placing a noncontaminated bait deposit, alone or in a bait station, on a contaminated substrate results in a 1.5-5 fold increase in LT_{50} value.