



California Science Center
CALIFORNIA STATE SCIENCE FAIR
 2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Matthew Y. Kennedy	Science Fair Use Only
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Fipronil, Abamectin, Hydramethylnon, and Boric Acid Versus Blattella germanica (Linnaeus)	J1314
Preferred Category (See page 5 for descriptions.) 13 - Pharmacology / Toxicology	Division <input checked="" type="checkbox"/> Junior (6-8) <input type="checkbox"/> Senior (9-12)
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>OBJECTIVE: The purpose of this experiment was to examine the effectiveness of different toxicants (Fipronil, Abamectin, Hydramethylnon, and Boric Acid) in killing German Cockroach populations. I believed that these toxicants would prove to be effective in eradicating infestations and that there would be no significant difference in efficiency.</p> <p>MATERIALS AND METHODS: Habitats were built and prepared with food, water, and harborage. Bait Stations each containing a different active ingredient were placed one each into a habitat. A habitat with no Bait Station was prepared as a control. Ten male German Cockroaches were placed into each habitat. Daily observations were made. Each death was recorded. Percentages were calculated and graphs prepared. Examined was the kill rate over time versus the reproduction rate of the German Cockroach over the same amount of time. Two trials were run.</p> <p>RESULTS: There was a significant difference in the effectiveness of these toxicants. Fipronil, the newest of these chemicals, was the most effective (100% were killed in 15 days in Trial #1 and in 6 days in Trial #2). Abamectin was the next effective. Hydramethylnon, the oldest of the chemicals studied, was the least effective of the chemicals (40% survived). Boric Acid was the least effective of them all. Note: Boric Acid is a different type of agent than the others.</p> <p>CONCLUSIONS: My hypothesis was incorrect. These toxicants are not effective enough to eradicate German Cockroach infestations given how quickly they can reproduce. The German Cockroach is known to become resistant to chemical insecticides/pesticides through an evolutionary process that can be accelerated by overuse of chemicals. While it would be easy to speculate that there may be a chemical resistance to the toxicants studied, it cannot be proven by this experiment. It cannot be verified that the cockroaches used came from ancestors that had been exposed to these chemicals. Further study and the breeding of the surviving cockroaches may bear out that there is chemical resistance. This would be interesting because my background research indicated that Hydramethylnon was highly effective and that early tests showed that insects had no chemical resistance to it.</p>	
Summary Statement (In one sentence, state what your project is about.) This project examined the effectiveness of certain toxicants in eradicating German Cockroach populations.	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Ms. Bobby Orr provided me with German Cockroaches, materials for habitats, and the use of her cold storage unit. Mr. Ron Whitehurst of Rincon-Vitova allowed me to attend a Cockroach Management Workshop given by experts in the field.	