

German cockroaches winning the war against pest control baits

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In this photo released by the University of Florida's Institute of Food and Agricultural Sciences, entomologists Phil Koehler, left, and Barbara Bayer, check the effectiveness of different bait pest control products on German cockroaches in a laboratory experiment – Nov. 21, 2006. Koehler and Bayer said that the roaches are avoiding some baits now on the market, and their research will help find new or improved bait chemicals that the pests will readily consume. Credit: University of Florida/IFAS/Josh Wickham

The German cockroach — one of the most common and hated household pests — is winning the war against some of the newest insecticides and baits, according to University of Florida researchers.

“Whatever you throw at them, they have an amazing ability to quickly

adapt and overcome adversity,” said Phil Koehler, an entomology professor with UF’s Institute of Food and Agricultural Sciences. “We know that they have developed resistance to many of the most widely used insecticides, and now they are turning up their noses at baits, including some that were very effective just a few years ago.”

He said the bait-avoidance problem was first noticed about five years ago in Florida, where the state’s warm climate is ideal for roaches, and in recent months has spread to other states as far north as Michigan.

“In Florida, pest control operators say that 60 percent of their customers have German cockroaches (*Blattella germanica*) that are refusing to eat most commercial baits, indicating there is something in the baits that roaches do not like,” he said.

Koehler and Barbara Bayer, a graduate research assistant, are working with pest control operators and product manufacturers to develop and test more effective baits for the German cockroach.

“It’s the roach that gives all other cockroaches a bad name,” Koehler said. “It’s also the most common cockroach species in homes, apartments, restaurants, hotels and other institutions in the United States and in most parts of the civilized world.”

As a result of their research, two new bait products designed for use by pest control operators have been shown to kill cockroaches that are refusing to eat existing baits, and the UF researchers are monitoring their effectiveness. The new products are Advion roach bait manufactured by Dupont and Max Force FC Select roach bait made by Bayer Environmental Sciences.

“It remains to be seen how long these two products will be effective,” said Bayer, who is not affiliated with the bait manufacturers. “Ten years

ago, German cockroaches began avoiding baits that contained glucose sugar, and now they are developing an ability to avoid other ingredients in some of the newest baits on the market. We need to learn more about which chemicals they like and do not like.”

Koehler said that their research shows that the development of a more effective bait will also provide a secondary kill of the pest.

“Some of the cockroaches that avoid the bait in the first instance will eat dead or sick cockroaches that did consume the bait, resulting in a secondary kill,” he said. “But wait, the yuck factor gets worse – some of the roaches that avoid the bait will consume contaminated fecal matter or vomit from dead or sick roaches that ate the bait, which then will kill them.”

He said their rapid reproductive cycle allows them to quickly develop resistance to chemicals and avoid toxic ingredients. If just a small percentage of the roach population is able to avoid eating a toxic chemical, those cockroaches would be able to reproduce in exponential numbers.

“Often measured in weeks, the roach’s rapid reproductive cycle allows the pest’s population to double every two weeks,” Koehler said. “One female roach and her offspring can produce more than 100 million roaches in a year. Female roaches only need to mate once to lay eggs for the rest of their lives. And, if they are able to avoid baits, then you’ve got a real serious roach problem in no time.”

Koehler, who directs UF’s Urban Entomology Laboratory, said cockroaches are one of the toughest insects on the planet, and some are capable of living for a month without food or staying alive without their head for up to a week. They can also survive under water for about 45 minutes.

“Cockroaches have been around for more than 300 million years – about 10 times longer than people – and these insects are very resilient,” Koehler said. “In fact, some people say cockroaches would be the only survivors in a nuclear war. They have a much higher resistance to radiation than people and other vertebrates – surviving a lethal dose 6 to 15 times higher than that for people.”

Besides avoiding certain chemicals in baits, roaches leave chemical trails in their feces, and other cockroaches follow these trails to discover sources of food, water and other roaches’ hiding places, Koehler said.

“Based upon this research, we might be able to develop new techniques for controlling cockroaches,” he said. “It might be possible to get rid of them by leaving a chemical trail that leads them away from the home.”

Koehler said the cockroaches carry a variety of disease-causing pathogens, including viruses and bacteria such as salmonella. Roach allergens appear to worsen asthma symptoms more than other known triggers. He cited a 2005 study by the National Pest Management Association that shows about 90 percent of homeowners nationwide believe that cockroaches are not a threat to their family’s health.

Source: University of Florida

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