

## **Fly-eating Wasps Part of Integrated Pest Control**

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Parasitic insects aren't the only method of reducing fly populations, but the wasp bred and marketed by Kunafin is one way to control flies.

"We want to make sure that people understand the process, and education is a big part of our deal. We are not just out there trying to sell a bag of bugs," said Kunafin entomologist Frank Junfin.

Kunafin raises seven different species of wasps. The wasp family includes species which can be noticeably seen by humans at eye level and whose stingers can be felt if humans run afoul of the wasps' territorial needs. But the wasp family includes the insects Kunafin breeds and sells, which measure less than a millimeter, who rarely if at all fly much above the ground, and whose stingers would not be felt by a human. "They are not visible in our presence. They're always in the soil," Junfin explained. "They're a wasp by definition, but they are soil insects."

The stingers of Kunafin's wasps have more of an impact on insect pupae. "They don't bother you or the animals," Junfin noted. "They are strictly an enemy of the fly and they stay in the soil."

The wasps are bred at Kunafin's facility in Quemado, Texas, which is about 145 miles west of San Antonio, but the soil wasps are indigenous throughout the United States and are legal to ship to every U.S. state except Hawaii. "They're naturally occurring in our soils," Junfin said. "It's not like we are bringing something new in here."

The Junfin family has been working with bio-control since 1959. They were involved in some of the first integrated pest management programs in the United States. Joe Junfin, Frank's father, was trained as an entomologist in Europe. After Frank Junfin graduated from Texas A & M with a degree in entomology, the company was incorporated and took the family's pre-immigration last name. Frank Junfin began by consulting and supplying *Trichogramma* wasps to farming operations for insect control in field crops and in 1978 Kunafin established mass rearing facilities for the Production of various species of fly parasites.

"They're a parasite to the fly by laying their eggs in the fly pupa," Frank Junfin notes. The offspring of the wasps then hatch, devour the fly larvae, and mate to form a new generation. The lifespan of the wasps ranges from 16 to 28 days, depending on the species.

The wasps' duties include crawling, digging, and searching. "They fly to move themselves a little bit, but they're

basically crawlers, Junfin explained.

The parasitic wasps have been used in horse corrals, cattle feedlots, dairies, poultry houses, swine facilities, and kennels. "Any type of manure producing facility or fly breeding area," Junfin said.

The wasps do not harm vegetation and are also used on a variety of crops and horticultural or ornamental plants. The wasps are effective against most field-type breeding flies including the typical horse fly, horn fly, and stable fly.

In Mexico the parasitic wasps have been found in fruit fly larvae, although Junfin hasn't yet promised the parasites as a cure for the Mexican Fruit Fly. "It's definitely found, but at this point in time we are not targeting that," he noted.

Junfin explained that the wasps likely adapted to that pupae when they found that material. He noted that wasps will adapt and will attack another type of fly pupae in the event a certain fly is not present.

The parasitic wasps sold by Kunafin have no known enemy other than disease, although with hundreds of thousands, if not millions of insect species an enemy of those wasps likely exists. "Every insect has an enemy," Junfin remarked. Junfin said that in the insect world an estimated 98 percent of insects are beneficial while the other 2 percent are pests. "There is a battle going on in the soil."

Junfin warned that the parasitic wasps are not a cure-all. Integrated pest control includes baits, traps, residual wall sprays, and general cleanliness. He also noted that Kunafin's services include consulting as well as sales and that fly control programs are custom designed to a customer's specific needs. "You create a total program, a total integrated program, and that is what we are after. Using these total combined tools is going to lead to fly reduction. We like to think no flies, but flies do come to us," Junfin noted. "Flies are coming in, so therefore, it's important to use all the tools."