IFAS Fire Ant Control Tests Look Good

By Julie Graddy

GAINESVILLE — A fungus that naturally occurs in fire ant nests in Brazil is extremely effective against the ants in lab tests here, making it a good biological control agent candidate, says a scientist at the Institute of Food and Agricultural Sciences (IFAS).

In lab tests, the fungi have killed 95 percent of the ants, says Dr. Jerry Stimac, IFAS insect ecologist.

"The fungi appear to be a timebomb in the nests," he says. "We've isolated several virulent strains of the fungi. When conditions are right, they may act as a plague in fire ant populations." Stimac has been working on the fungi for several years with Brazilian scientists in Sao Paulo and Mato Grosso, two Brazilian states.

Because of their aggressive nature and survival-oriented biology, fire ants are difficult to control with chemicals. "Over $200 million has been spent in an unsuccessful attempt to control or eradicate them in the Southeast," says Stimac.

The ants only have to come into contact with the fungi for it to work, says the IFAS entomologist. "The fungal spores fuse to the ant's body, penetrate the body cavity, reproduce and burst back outside to form spores," he explains. The fungi are non-toxic to humans and other vertebrates.

Brazil is the presumed homeland for fire ants, and in areas where the fungi are found in nests, the ants are under control, notes Stimac. Stimac is currently working with Dr. Sergio Alves of the University of Sao Paulo to regularly monitor fire ant nests in the Mato Grosso in hopes of observing the plague-like quality of the fungus.

"Our next step is to find out if the fungi are suitable as a biological pesticide," says Stimac. Toward that goal, he and IFAS colleague Dr. Drion Boucias are culturing the fungi for treatment of fire ants in the laboratory.

Many fire ant colonies have multiple queens, all of which must be killed to kill the nest, Stimac notes. IFAS scientists will apply a solution of spores as a drench or powder over soil containing nests in the lab to discover what, if any, protection the colony uses to shield the queen against fungal contact. The big question is whether the fungus spreads within the nest to make it an effective control of multiple queen colonies.

"We have some reserved optimism because we've gotten such good first results, but ants are social insects. You never know how they'll act. But we're hopeful. These fungi seem to be the most promising development on the research horizon right now." ■

Virus May Help Solve Blue-Green Algae Problem

By Edith Hollander

GAINESVILLE — The polluted waters that allow blue-green algae to flourish may also support viruses which kill the algae, says an aquatic microbiologist with the Institute of Food and Agricultural Sciences (IFAS).

Dr. E. J. Phlips, a researcher in the Fisheries and Aquaculture Department, collects water samples from sewage systems, polluted lakes and waterways throughout the state searching for viruses which kill only blue-green algae. Phlips tests these viruses with the algae in his lab, since the two rarely exist together in the water.

A grant from the U.S. Department of Agriculture is directed at Lyngbya, one type of blue-green algae found in Florida. "It forms a very dense, thick mat on the bottom of lakes, produces a bad odor and is reputed to produce toxic substances, Phlips said.

Florida's growing population, coupled with its naturally warm climate and high rainfall, has increased the probability of blooms, Phlips said. The algae blooms (high concentrations of algae) can physically clog lakes and waterways, emit foul odors, cause a bad taste to drinking water, and in some cases produce toxins dangerous to animals and man.

Algae breeding grounds are enhanced by sewage, runoff and industrial waste dumpage into lakes and canals. Light intensity, rainfall, temperature, carbon dioxide and oxygen levels also affect the algae.

Phlips hopes viruses will biologically control the algae and replace or reduce the present use of herbicides and harvesting.

"A lot of blue-green algae are tolerant of herbicides, so a high concentration is used to achieve effective control," Phlips said. "Herbicides are also general in their action, so they kill off good blue-green algae with the bad," he said.

Phlips plans to expand the project to test other algae types. "We anticipate that through the course of the year we'll find a number of viruses that work on different species," Phlips said.

Most lakes and waterways support different types of algae at the same time, Phlips said. "For example, several dozen type of blue-green algae have been found in recent samplings of Lake Apopka, and Lake Okeechobee," he said.

"Our ultimate goal is to establish a collection of the major bloom forming species of blue-green algae," Phlips said, "and use this as a basis for work on the development of biocontrol technologies." ■