Are biologicals smart mole cricket control?

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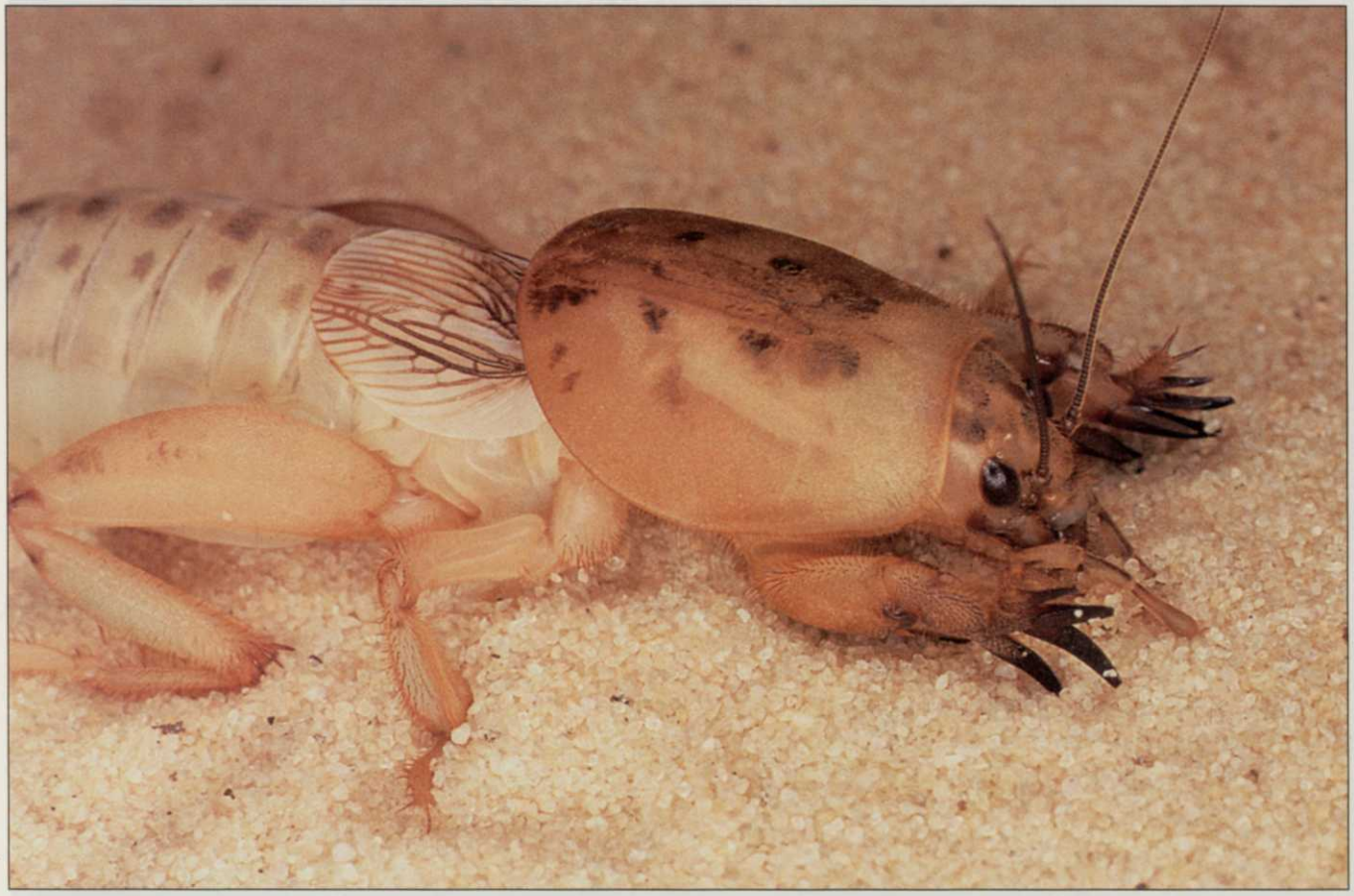

Most turf managers try to control mole cricket pests with a bait, or granules or liquid containing something that kills them. That "something" may be chemical materials (a chemical pesticide) or living biological materials (a biopesticide).

Some of the newer chemical materials, called "biorationals," are synthetic chemicals that, for example, mimic the action of insects' growth hormones to interfere with development.

The biological materials may be insect-killing nematodes (now available commercially) or fungal or bacterial pathogens (being tested experimentally).

These products can be placed exactly where they are needed. In general, the chemical pesticides work faster than the biopesticides, but the biopesticides affect a narrower range of non-target organisms and are more environmentally acceptable. The "biorational" chemicals are somewhere in between, because they tend to work more slowly than the traditional chemicals, and to have less effect on animals other than insects.

Natives not pests

The 10 mole cricket species in the U.S. and its territories (including Puerto Rico and the Virgin Islands) differ in appearance, distribution, behavior and pest status.

In fact, the native mole crickets are not pests. Our pest mole crickets are immigrant species.

The three species that arouse the ire of turf man-

agers in the southeastern states all belong to the genus *Scapteriscus*. They came from South America, arriving at the turn of the century in ships' ballast. They are the short-winged mole cricket (*Scapteriscus abbreviatus*), the southern mole cricket (*Scapteriscus borellii*), and the tawny mole cricket (*Scapteriscus vicinus*).

The southern mole cricket lives in lowland areas of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana and eastern Texas. Recently it turned up on a golf course near the Arizona/California border.

The tawny mole cricket has a similar but narrower range and may not yet have spread west of the Louisiana/Texas border. The short-winged mole cricket in the contiguous states is almost entirely in coastal areas of peninsular Florida.

When they got to the U.S., these pest species began to spread, and they continue to spread today. One reason they have been successful here is that the natural predators that control them remained in South America.

Natural enemies

Introducing the specialist natural enemies from South America to the southeastern states is a possible solution. This kind of activity, called classical biological control, has been partially accomplished in Florida.

First, the biological control agents were observed in South America and identified. Then some of them were brought under federal permit to a quarantine facility in Florida for study.

It had to be learned how to culture them, and also how to culture mole crickets as year-round food for them. Only agents shown to be harmless to non-target organisms were cleared for release. These had to be produced in large numbers for release in Florida, then releases were made.

Populations of them became established at various places, then spread to nearby counties. The spread of populations had to be tracked, and the effect on mole cricket populations had to be evaluated. The details differ widely from species to species. For example, a parasitoid fly was released by the thousands, at multiple sites, and quickly spread throughout south and central Florida. A predatory beetle has not yet been released.

The life cycle of the short-winged mole cricket. This pest is found in coastal regions of the Florida peninsula.

Encouraging results

Mole cricket populations have been monitored for over 15 years at three trapping stations in Florida. Mole crickets trapped at the southwestern station over the last three years number on average less than an eighth of what they averaged in the years before releases were made. The same two biological control agents are established near the two stations in north Florida, where mole crickets trapped over the last three years number on average about a third of what they were before releases were made.

In north Florida, one of the two biological control agents occurs only in small numbers and probably has little effect; however, a third agent has just become established and its effect should increase.

These biological control agents are achieving area-wide biological control of pest mole crickets. There are more kinds of biological control agents yet to be researched and released.

The big questions to ask are: how low can we suppress mole cricket populations with classical biological control agents, and to what degree can we reduce the use of pesticides? □

Call up 'Mcricket' for answers

How can you tell the 10 species of mole crickets in the United States apart?

It's much easier to identify the adults than the young (nymphs) to the species level. One way to identify them is to use a computerized knowledge base called *Mcricket*. This knowledge base not only has graphics that let you identify the mole crickets, but it also has information about their life cycles and behavior. It also has information about control methods, including tutorials.

Mcricket was developed by University of Florida entomologists Tom Fasulo, Howard Frank and Don Short with extension agents Harold Jones and LaRue Robinson. Other than that, any IBM-compatible PC with 3.3 MB of hard disk space, 640 KB of RAM, and one floppy drive will do.

Mcricket: Alternative Methods of Mole Cricket Control including the software (three diskettes, Program 089) and manual (Circular SW-089) can be purchased as a package from: University of Florida, IFAS Software Support, P.O. Box 110340, Gainesville, FL 32611-0340. Phone: (352) 392-7853. Mcricket costs $30 for Florida residents (add sales tax) and educational institutions, $40 for all others. Prepayment by check or Visa/MasterCard is required. Checks should be made out to the University of Florida.

However, if you know how to surf the World Wide Web from your computer, you can access Mcricket free at:

http://gnv.ifas.ufl.edu/~ent1/mcricket/index.html