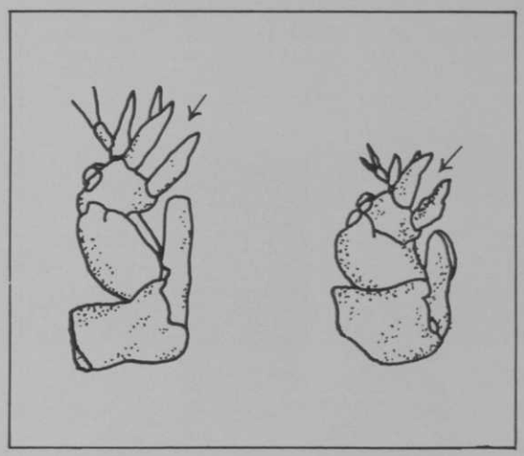
Mole crickets damage turf across the South

A mole cricket tunneling through the soil, feeding on turfgrass roots produces three types of damage. The first two are rather obvious. The ridges it leaves on the surface look as though a miniature mole has been at work. Rootfeeding can dangerously weaken the turf. The third type of damage is such that you might think it was caused by the crickets actually feeding on the plant. However, while the rootfeeding itself might not critically damage the plant, the tunneling creates an uprooting effect and subjects the plant to dessication. The loosening of the soil causes the plant to dry and turn brown.

Dr. James Reinert, University of Florida at the Agricultural Research Center in Ft. Lauderdale, has been studying the mole cricket and its habits for between three and four years. There are now eight people in the state of Florida working with the mole cricket. It was determined that, over the two year period of 1976-1978, in the state of Florida alone, mole crickets caused $100 million in damage. The damage is not solely to turf, but involves pasture grasses, truck and field crops. Turf is an important crop as any in Florida because the state depends to a great extent on the tourist trade that is drawn by the golf courses.

The mole cricket and its damage is not confined only to Florida, either. While Dr. Reinert has been gathering data for northern Florida, he is not sure whether it holds true for the mole crickets that damage turf throughout the South. Mole crickets have created severe problems along the coast of southern Georgia. Many exclusive courses there are on an intensive mole cricket program just to try to keep their grass. Dr. Reinert noted one superintendent from that area who was planning to spend two-thirds of his pesticide budget against mole crickets.

But while research to date has not moved at the pace the scientists would like, there are promising developments on the horizon. Imagine if you can, a forlorn scientist in the middle of a golf course playing old records of the mole cricket's mating call. It really doesn't come off that romantic, does it? However, Dr. Tom Walker with the University of Florida in Gainesville has recorded the mole crickets mating call and can, during the mole cricket's mating flight, attract large numbers. This will allow scientists to study the crickets in large numbers in their controlled experiments and determine new and/or more efficient ways of combatting them.



The tibial dactyls (arrows) of the Southern mole cricket (left) are separated by a space almost as great as the width of one of them, while the space is much less than that width in the Puerto Rican mole cricket. The space is U-shaped in the Southern and V-shaped in the Puerto Rican.

Mole crickets fly predominantly two times a year. In the Gainesville area, Dr. Reinert says that they fly some in February with the main flight coming in late May or early June. Coinciding, naturally, with the mating flights, egg production begins in the latter part of March with the peak egg-laying period coming in late May through mid-June. Temperature determines the time period before the eggs begin to hatch. Those laid in March typically require about 35 days to hatch while those deposited in May or June require only about 20 days.

The eggs are deposited in hollow "chambers" tunneled in the soil. The chambers are typically in the upper five inches of the soil profile, but may vary from one to twelve inches. Low temperatures and dry soil will cause the mole cricket to dig deeper.

The mole cricket goes through a typical incomplete metamorphosis. It goes from egg to nymph with eight instars, to adult. As indicated, nymphs will begin to hatch in the latter part of April. When it first comes out, the nymph is completely white, but quickly turns brownish-black. The quarter-inch long, first instar will tunnel to the surface approximately nine days after hatching. As the cricket enjoys his turfgrass diet, he grows bigger, finally reaching 1½ to 1¾-inches as an adult by about mid-September.

Dr. Reinert has found that the crickets feed severely in bermudagrass and bahiagrass, both of which are used in turf culture. Zoysia does not seem to be affected, although, relatively speaking, there is little of it around. St. Augustine is damaged, but due to its mat type of growth, is not affected so much. Dr. Reinert notes that loose knit grasses, such as bahia, are more subject to dessication when the soil is loosened under it. Bermudagrass is usually cut very short, leaving it without protection and mole cricket damage shows up right away.

Dr. Reinert suggests that we may see switches to new varieties as they are developed. He is doing work looking for host plant resistance to insects. One that proves promising is an experimental variety of bermudagrass that is also 100 percent resistant to the bermudagrass mite. While not resistant to mole crickets, because they do feed on it, the variety is tolerant of the feeding activity. In a controlled experiment, Dr. Reinert set up tests of the grass with and without the mole crickets. The grass with the crickets actually had more root and top growth than the grass without the crickets. "The natural assumption," Dr. Reinert says, "would be that we're actually stimulating more growth by the cricket activity. The bermuda was actually spreading out over the damaged area." The grass hasn't been tested in field plots yet and still has only an experimental number. It will be a year, maybe two before enough data is accumulated to release it to the industry.

The grass itself is coarse and looks similar to common bermuda. It requires low fertility however, and would probably make a good grass for

roughs, fairways and tees, but definitely not for greens, Dr. Reinert suggests. He points out, though, that by eliminating the roughs, fairways, and tees you have eliminated most of the acreage you would have to treat.

That is one of the main problems, he adds, in treating for mole crickets. The amount of acreage in treating the entire course and the price of insecticides make it prohibitive to those who can't buy it just because they need it.

Dr. Reinert has noted extensive damage from areas with mole cricket densities of four per square foot. Their nature is something that is going to take more study before it is fully understood. On the course, mole crickets often start in the lip around traps and zero in on the greens. Dr. Reinert did some tests in which he gave mole crickets a choice between St. Augustine, bermudagrass, cypress mulch and bare sand. He counted the most crickets in the bare sand.

There are several chemicals that are labeled for mole crickets. Dr. Reinert reports good results with dursban, Baygon, Scotts Nematicide / Insecticide (ethoprop), and malathion. Dr. Reinert likes to encourage superintendents to use chemicals in bait form.

The crickets come to the surface at night and will readily feed on the baits. The cricket nymphs do not seem to want to feed however, if the soil is dry or cold. Once the baits are out, heat and moisture will act to break down the active ingredients. Timing the bait application in June or July, right after the rains end and are not expected for some days again would be just about right. There is also the fact that irrigation after putting the baits out will destroy their effectiveness. Good baits include 0.5 percent Dursban, 2.0 percent Baygon and 2.0 percent malathion.

Others in the industry have pointed out that there will probably be no new pesticide developments at all in the decade to come. However, some pesticides on the market that are not labeled for mole crickets show a pronounced activity on mole crickets as they are sprayed for other intended targets.

The effects of these chemicals on non-target wildlife could lead to loss of their use entirely, however. Extreme care should be taken in using any of these chemicals, not only for your own safety, but for the continued use of the pesticides we have that have proven so effective against the pests that they are labeled for.