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## **Mole Cricket IPM on Pasture**

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Pest mole crickets continue to threaten the livelihood of cattlemen, golf course managers, and turf producers as well as those who care for public parks, playgrounds and home owners. They damage pasture and sod grasses by feeding on the roots, stems and leaves and by desiccating soil around the roots through their borrowing activity. Damage in pastures first appears in yellow patches which die and turn brown. In areas of high mole cricket population density, the surface 6 to 10 inches of soil layer is honeycombed with numerous galleries and the ground feels spongy when stepped on. Heavily-damaged pasture has virtually no root system and is easily pulled from the soil by livestock or foot traffic. It is estimated that south-central Florida has approximately 100,000 acres of bahiagrass pastures destroyed annually and the damage results in loss of hay revenue and the need for pasture reestablishment at an annual price tag of \$50 million to Florida livestock producers.

Most producers are aware of the beneficial nematode (a tiny parasite) brought to Florida by the University of Florida from tawny mole cricket's original home in South America for the biological control of pest mole crickets. In 2002, the UF-IFAS Mole Cricket Task Force established a commercial source for this mole cricket nematode, with a trade name Nematac S and produced by Becker Underwood.

Approximately 75% of the 3.5 million acres of improved pastures in Florida are sown to bahiagrass. This grass provides the basic feed resource for the cow-calf industry but is most susceptible to mole crickets. We initiated experiments to determine whether the nematode would reduce the density of mole crickets and ameliorate the damage to bahiagrass pastures. If applied to an entire area at a dosage of 1 billion infective nematodes per acre, the price of the nematode product alone amounted to \$200 per acre.

This initial price tag was exorbitant to cattle producers who owned thousands of acres of land to be treated. In our experiments which began in the year 2000, nematodes were not applied to entire plots, but in strips that covered 0, 1/8, 1/4 and 1/2 of each plot. The idea was to reduce materials cost in expectation that nematodes would be spread by infected mole crickets to fill in gaps between the treated strips. In order to determine activity of mole crickets and the condition of the bahiagrass, we installed linear pitfall traps and made damage estimates of the grass condition from 2000 to 2004. Our research showed that three years after nematodes were applied, the percentage of mole cricket population infected with nematodes at any particular time stabilized at 20 to 35%, regardless of initial nematode application dosage. The nematodes have recycled in mole crickets, spread over the entire pasture, and persisted for four years. The number of mole crickets trapped on strip treated fields declined by 85% and bahiagrass ground cover increased from 40 to 95%.

Based on our work, strip treatment to cover 1/8 of the total area (0.125 billion nematodes per acre) has become the standard recommendation for cost-effective biological control of mole crickets with Nematac® S on bahiagrass pastures in Florida. It has reduced the cost of material from \$200 to \$25 per acre for pastures. With funds provided by Florida State legislature, we distributed 65 billion (at 0.125 billion per acre) nematodes across 32 counties in Florida and conducted more than 50 workshops to demonstrate proper nematode application techniques to producers. With the exception of a couple of sites, the nematodes have become established at all locations treated and our survey indicates 20-30% of nematode infection in the mole cricket population at most sites treated. We have also established a source of custom nematode application, Ingram Grove Services, Inc. The use of Nematac® S for mole cricket control has become popular with producers and last spring, the entire production of about 50 billion was sold out within a month due to unexpected high demand. March through May provides the best window for applying Nematac® S because of the abundance of adult mole crickets. Hopefully, as more producers purchase and use the product, the nematodes will become widespread and naturalized to provide permanent relief to grass producers throughout the Florida. Call your county agents for help in contacting a vendor if you want to apply some nematodes this spring. The Southeast Territory Manager for Becker Underwood is Al Clarke who may be reached at 407-474-8303.