

I. INTRODUCTION

The most important insect pests of turf and pastures in Florida are mole crickets. And their damage is not restricted to grasses. Their feeding and tunneling also destroy seedlings of vegetables, ornamentals, and tobacco. Insecticides commonly applied to control mole crickets in lawns, golf courses, and seed beds are expensive and not always effective. In pastures there is no control that is economically feasible; yet without control, stands of pasture grasses are frequently so reduced as to require replanting. The annual cost of mole crickets to Floridians is no less than \$30 million.

In 1978, in response to increasing concerns of cattlemen, turf managers, and home owners, IFAS intensified its research on mole crickets. The resulting project was partially funded by a continuing special appropriation from the State Legislature. Its primary goal was to eliminate mole crickets as a problem in Florida (for example, by establishing self-sustaining natural enemies). Its fall-back goal was to make temporary control of mole crickets so economical that even pastures could be protected (for example, by reducing costs of insecticidal control by an order of magnitude). Because little was known of mole cricket systematics, behavior, ecology, and population dynamics, a third goal was given initial priority in order to improve chances of achieving either of the other two—namely, ascertaining fundamentals of mole cricket biology.

This bulletin summarizes the results of the first five years of IFAS's mole cricket project. It describes the biology of pest mole crickets, including new discoveries that helped delineate promising pathways toward lessening the impact of mole crickets in Florida. Under the headings of Biological Control and Chemical Control it discusses progress and prospects relative to specific permanent and temporary solutions. The three that now seem most promising are (1) introduction of natural enemies from South America, (2) substitution of resistant grasses for susceptible ones, and (3) development of a cheap, safe, effective, insecticidal bait.

History

None of the three species of pest mole crickets in Florida is native. All were accidentally introduced to the southeastern United States about 80 years ago. By the 1930s they had spread to the vegetable growing areas of central Florida. Their effects on truck crops became

so severe that the USDA undertook research at Sanford (1934–1939), culminating in the distribution, in 1940, of 1,258 tons of arsenic bait for mole cricket control in 12 Florida counties. Research and control efforts were interrupted by World War II, but shortly afterwards, mole crickets were effectively controlled by newly developed, cheap, long-lasting insecticides—especially DDT and chlordane. Relief was short-lived. Because of hazards to man and his environment, persistent pesticides were banned or severely restricted, and the insecticides permitted for mole cricket control became more expensive and less lasting. At the same time, cattlemen in Florida were spending heavily to change raw rangeland into improved bahiagrass pastures—a favored food for mole crickets. By the mid '70s, mole crickets were once again out of control. Pastures were being lost with no economic recourse; turf managers were being forced to use increasingly costly insecticides with increasingly uncertain results. This was the situation that prompted the research reported here.

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