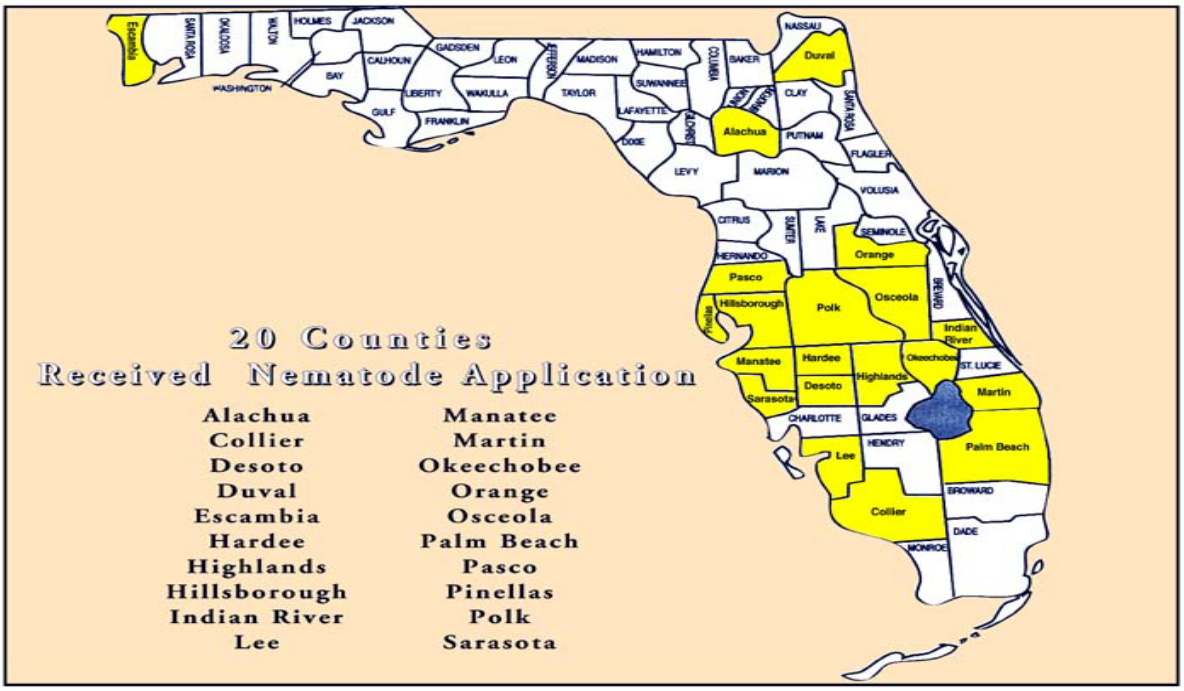
MOLE CRICKET STATE PROGRAM UPDATE

By
Dr. Norman C. Leppla

The Florida Legislature provided $300,000 in 2001 to the Florida Department of Agriculture and Consumer Services, Division of Plant Industry and the University of Florida, Institute of Food and Agricultural Sciences to support long-term, cost effective control of harmful mole crickets. These non-native mole crickets are highly damaging to pastures, golf courses, turf farms and urban landscapes, causing $55 million annual losses to Florida pastures. The state funds have been used to:

- Establish commercial production of *Steinernema scapterisci* as a mole cricket nematode biological control product, Nematac S, by MicroBio (U.K.)/Becker Underwood (U.S.) for the marketplace. About 300 billion nematodes will be for sale on March 1, 2002.
- Apply more than 50 billion nematodes in 20 Florida counties during the fall of 2001.



About 50 billion nematodes were supplied by MicroBio/Becker Underwood and applied to pastures, golf courses, sod farms and urban landscapes. Research included application rates and patterns in different situations, baseline application parameters for equipment modification, nematode establishment and impact evaluation, correlation of mole cricket trap capture with damage, monitoring techniques to demonstrate mole cricket death

(sound and pitfall traps), and rate of dispersal of infected mole crickets. Extension and education support is being provided within the two program areas.

The Mole Cricket State Program Subcommittee makes programmatic decisions, with periodic direction from the Mole Cricket Task Force. The project was split into two parts, Golf Courses & Landscapes and Pastures & Sod Farms. Pastures & Sod Farms is led by Dr. Martin Adjei (UF, IFAS, Ona) with Herb Harbin (Florida Cattlemen's Association), Lockie Gary (UF, IFAS, Hardee County) and Dave Dymond (H & H Sod), and Golf Courses & Landscapes is under the direction of Dr. Eileen Buss (UF, IFAS, Gainesville) and Tom Hinks (MicroBio/Becker Underwood, Canada) with consultation by Dr. Howard Frank (UF, IFAS, Gainesville). Administrative and technical support is provided by Drs. Bill Brown and Norm Leppla (UF, IFAS, Gainesville), and Don Harris and Ed Burns (FDACS, DPI, Gainesville). Drs. Byron Adams and Khuong Nguyen identify nematodes from mole crickets collected in the field.

Mole Cricket State Program Organization

Overall Program Support

Bill Brown
Norm Leppla
Don Harris
Ed Burns
Byron Adams
Khuong Nguyen

Pasture & Sod Farms

Martin Adjei
Herb Harbin
Lockie Gary
Dave Dymond

Golf Courses & Urban Landscapes

Tom Hinks
Eileen Buss
Howard Frank
County Extension Clientele

Extension and Education Projects

Nematode applications were made on at least 21 golf courses, extending from Pensacola to Naples, to suppress pest populations of the tawny, southern and short-wing mole crickets. The nematodes were applied during the day with normal fairway spraying equipment using a spray volume of about 50 to 120 gallons per acre (gpa). Filters were removed and nozzle types included hollow cones, tee-jets, and small and large flood-jets. Nematodes were applied to either one or 1/2-acre areas of Bermudagrass at the standard

rate of one billion per acre. Typically, the sites were irrigated before and after the nematodes were applied. The effectiveness of the nematodes will be evaluated within the next few months but preliminary results in Alachua County indicate a background level of nematode infection in mole crickets of about 20%, due to previous applications, and an increase to at least 30% after the recent augmentation.

Golf Courses That Received Nematode Applications

Golf Course	County
Jacksonville University	Duval
Gainesville	Alachua
Ironwood	Alachua
Stony Brook	Orange
Interlachen	Orange
Orange County National	Orange
Keen's Point	Orange
Solovita	Osceola
IGM Sandridge	Indian River
Willoughby	Martin
Gleneagles	Palm Beach
Belleair	Pinellas
Avila	Hillsborough
East Lake Woodlands	Pinellas
Sable Trace	Sarasota
Lochmoor	Lee
Imperial	Collier
Royal Poinciana	Collier
Old Collier	Collier
Vineyards	Escambia
Lost Key	Escambia

Nematodes were applied to urban landscapes using spray techniques similar to those for golf courses. There was an interest in using TopChoice (fipronil) in an integrated pest management (IPM) system for fire ant control in areas where the nematodes were being released. According to the label, TopChoice is broad spectrum, i.e., ants, fleas and ticks. TopChoice and FireStar (fipronil bait) are *curative* products that kill fire ants and mole crickets for several months after application. ChipcoChoice is a fipronil formulation especially for mole cricket control. These products are particularly useful for reducing heavy populations of pest arthropods. The mole cricket nematode is a *preventative* product for long term suppression of mole crickets. It reproduces in mole crickets and spreads as the insects move about. Perhaps fipronil products can be used on *hot spots*

where pests are abundant and nematodes can be applied in other places. The IPM strategy will depend on tolerances for damage to turf in different contexts. However, these and other issues have not yet been addressed because both the chemical and biological products are new to the marketplace.

Urban Landscapes That Received Nematode Applications

Landscape	County
Disney Sports World	Orange
Altamonte Springs Athletic Field	Orange
Twin Lakes Park Athletic Field	Sarasota
Don Goode	Columbia
Peggy Dessaint	Manatee
UF Envirotron	Alachua

Initially, at the ranches, 1/2, 1/4 and 1/8 billion nematodes were applied per acre in strips to determine if they would establish and spread across the pastures. Infected mole crickets are highly mobile and nematodes were found throughout the pastures within a few months. Infection levels ranged from 86% for 1/2 acre strips to 60% for 1/8 acre strips. Mole crickets were dying and the pastures are beginning to recover.

Ranches That Received Nematode Applications

Ranch	County	Ranch	County
Hollingsworth	Desoto		Okeechobee
Bill Keating	Hardee	Yates	Orange
Tom Kibler	Manatee	Deseret	Osceola
John Payne	Highlands	J. B. Starkey	Pasco
	Hillsborough	Barber Ranch	Osceola
Marvin Taylor	Manatee		Sarasota

Ranches That Received Nematode Applications in Spring 2001

Ranch	County
Helen Keller	Hardee
Peace River	Hardee
Luther Bryan	Hardee
William Wise	Desoto
AlBar	Pasco
Mary Nutts	Pasco
Hughes Combee	Polk

Nematodes were applied to sod farms by surface spray, as on golf courses, but soil injection equipment may be used in the future.

Sod Farms That Received Nematode Applications

Sod Farm	County
H & H Sod Farm	Osceola
Schrodder & Manatee	Manatee
Duda	Polk
Bethel	Desoto

Nematac S will be supplied from MicroBio/Becker Underwood through four distributors for golf courses and urban landscapes (athletic fields), one for homeowners, and six for ranchers. Nematodes will be stored at Becker-Underwood and shipped direct to customers via courier. Thus, distributors will not stock the product but will be the purchasing point. Orders placed on Monday through Thursday will be shipped overnight; Friday orders will be sent on the following Monday. The distributor's prices for Nematac S have not been established, except for Garden's Alive (http://www.gardensalive.com/index.asp). A press release is available that describes the product and MicroBio/Becker Underwood has prepared a draft label.

Suppliers of Nematac S

Golf Courses and Athletic Fields	Pasture and Sod Farm Market
Golf Ventures	UAP Florida
ProSource One	Helena
UHS	ProSource One
Lesco	Diamond R Fertilizer
	Lykes AgriSales
Homeowners	Ben Hill Griffin Fertilizer
Garden's Alive	

In summary, the Mole Cricket Task Force has orchestrated the production and application of more than 50 billion mole cricket nematodes at 52 locations in 20 Florida counties. This highly successful state project can be expanded into more counties to further distribute the nematode, help suppress damaging mole crickets, and minimize economic damage to golf courses, urban landscapes, pastures and sod farms.

Nematode Applications in Fall 2001

Locations	Number of Sites	Nematodes (Billion)
Ranches	19	20
Sod Farms	4	2
Golf Courses	21	24
Urban Landscapes	6	4
Total	50	50

Additional state funds (approximately $150,000) have been requested to expand the project into more counties, determine the impacts of the nematode releases on mole crickets, conduct county extension activities to educate the public on how to use the nematode product, and transfer the technology to the private sector. The overall objective of the project is to conduct research/demonstration projects that will widely distribute the entomopathogenic nematode in Florida; determine its establishment, rate of spread and impact on *Scapteriscus* spp. mole crickets; and support its commercialization.