

USGA Research Benefits All Golfers in the SE Region – Part 2

By Patrick O'Brien, Director, SE Region

The USGA Turfgrass and Environmental Research program has funded projects at land grant universities across the country at a cost of \$40 million since 1920. This web update is the second in a three part series on how these USGA funded research projects benefit golfers.

Project Title: The Development and Evaluation of New System to Control Nematodes on a Golf Course

Location: Clemson University

Researcher: Dr. Bruce Martin, Clemson University

Summary

Nematodes are microscopic root pests of golf course turfgrasses. Nematode feeding habits weaken the turfgrass plant causing the use of additional resources to maintain plant health and to lessen injury from other environmental stresses such as drought, heat, poor water quality, nutrient deficiencies, and secondary infections from plant diseases. Nematodes are especially an issue in sandy soils, and especially at putting greens where high sand rootzone are common and multiple stresses occur due to routine management required for these intensely managed playing areas.

Options to suppress nematodes are limited today for golf courses with only a few products available and under development. Chemicals available in states with labels include Curfew and abamectin, and biological products include pathogenic or suppressive bacteria, including *Bacillus firmus* (Nortica), or *Pasteuria usgae*, a parasite of sting nematode, and *Belonolaimus longicaudatus* (Econem).

The focus of this research was to develop or enhance existing technologies to suppress nematodes, and especially the sting nematode that is the most damaging in the SE Region. Testing was done to develop formulations that provide longer residual activity of existing chemical and biological products to maximize their efficiency for nematode suppression.

A new process of designing slow release formulations for bacteria and abamectin was investigated utilizing liposomes to better improve nematode suppression. Liposomes are artificially-constructed lipid vesicles which store various cargos. Ingestion of these liposomes by nematodes into their digestive tracts successfully occurred. Testing was conducted with two different nematicides within a liposome resulted in 100% mortality of nematodes with the use of one of the products. These preliminary studies at Clemson

University and University of Illinois seem to indicate further research with liposomes could help provide new technology for effective nematode suppression.

Golfer Benefits

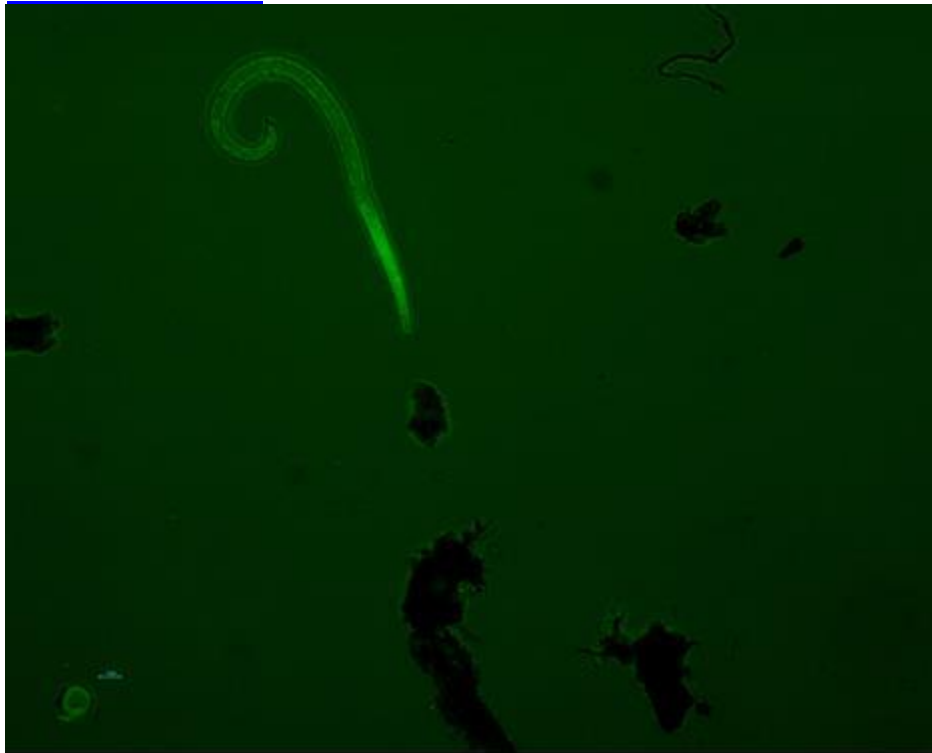
At this time, golfers have not benefited so far from the research. However, if the use of liposomes to deliver nematode suppression chemical products and bacteria happens in the future, better golf turf quality will happen due to the healthier root systems. Lower overall operational costs also would come about with healthier turf, along with the use of less water, fertilizer and weed control products without the renovation efforts needed after nematode damage. With the limited options today for nematode suppression on golf courses, this news provides a hope of future optimism to combat this devastating pest of golf turf.

For additional information on this USGA research project, please click on this link [The Development and Evaluation of New System to Control Nematodes on a Golf Course](#).

Source: Patrick O'Brien (patobrien@usga.org)

Information on the USGA's [Course Consulting Service](#)

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A spiral nematode (*Helicotylenchus sp.*) that was treated with liposomes containing a fluorescent dye; after washing excess dye, you can see fluorescence in the body of the nematode, indicating absorption of the liposomes.