

"We're a long way from the answer," Dickson said. "This organism is very host-specific. In our preliminary work, we took soil from areas infested with nematodes. We dried it and found that the soil can kill nematodes, but after we autoclave the soil, which kills the spores of the bacteria, the soil no longer inhibits the nematode."

The fact that these anti-nematode bacteria are so host-specific may make them hard to produce, but it's still a good thing: it means the anti-mole cricket nematode is safe.

IFAS nematologist Smart says, "The nematodes we're using have an extra cuticle, so they have an extra layer of protection but the bacteria don't seem to attack them anyway."

Smart said he has been studying *Pasteuria penetrans*, a bacteria that attacks root-node nematodes such as those that afflict tomatoes.

"The trouble has been growing sufficient quantities because we shouldn't grow it in vitro," he said.

The pattern runs like this: spores of *Pasteuria* bacteria attach to a

nematode's skin and send a penetration peg into its body. In the soil, the bacteria are in spore stage. Eventually the growing bacteria fills the nematode's body — this is the vegetative phase of growth — then it goes into spore stage. The bacteria can't move around on their own. But thousands of spores emerge from one nematode host.

"If enough spores attach to a juvenile nematode, it may die outright," Smart said. "If the numbers are fewer, the nematode may go into plant roots and begin developing before it dies. If the spore load is low enough, the female will produce few, if any, eggs because the bacteria ruins its reproduction structure."

Just to put things in perspective, *Pasteuria* are about one fourth the diameter of a nematode, but the nematode is much longer, about one millimeter.

"They are barely visible, but so thin that they're hard to see," Smart said. "You can see a bunch of them; they look fuzzy. But seeing one is difficult.

IFAS tests compost as medium for sod

Dr. Albert Dudeck at IFAS in Gainesville is testing composted organic waste as soil to produce sod and turf. He thinks it could be a boon to Florida's \$1.5 billion turf industry (76 percent of that is St. Augustine grass for home lawns).

"We're looking at a lot of things," he said, listing garbage, yard trash, tree trimmings, sludge/garbage combinations, wood chips, stable litter, mushroom compost, rice hulls, and sugarcane bagasse.

"The primary need is the mandated 30 percent reduction in landfill waste in the next couple of years."

The nutritious composted waste grows a crop of turf in three to four months rather than a year and a half. That could reduce the 75,000 acres now dedicated to commercial sod production.

Dudeck says, "It means a tremendous opportunity to use the waste.

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The tricky part is more frequent, more controlled watering by misters rather than traditional irrigation. Also, the old harvesting machinery isn't appropriate.

"You move the mulch-grown sod in its entirety," Dudeck explains. "It's grown on plastic, and you roll it like a carpet to move it. It's light and only an inch thick."

The bonus for outdoors-loving Floridians: 5,000-year-old Everglades muck soil can stay there and be productive for us, rather than be shipped

throughout the Southeast to sod suburbia.

•••

Hoelon will kill your goosegrass without yellowing your turf. That's what Bert McCarty says.

"This is the first product since 1930 to offer this kind of control," said the weed control researcher at the University of Florida's Institute of Food and Agricultural Sciences in Gainesville. "It's pretty revolutionary."

Goosegrass is a semi-annual weed in fine turf, highly undesirable on putting greens and football fields because it clumps and because it grows horizontally.

In the past, because sprays yellowed turf, many golf courses used hand labor

to pull goosegrass out.

After he read of Hoelon's anti-goosegrass success in wheat, grains and row crops, McCarty did research that helped get Florida the first 24-C (state-only) registration, allowing use of Hoelon on turf.

"Florida is the only state that has it currently," McCarty said. "Our golf courses are enjoying a pretty exclusive privilege. Hoelon is far superior to any other products available, which are materials developed in the 1930s."

The older materials require multiple applications and can discolor turf.

Hoelon (chemical name "diclofop") gives 95 percent control in one application per year at half the rate of active ingredient per acre.

"It definitely gives our guys an advantage," McCarty said.

Wayne Mixson at O.M. Scott's turf research center in Apopka recommended Hoelon be used with a pre-emergent herbicide to fight goosegrass.

•••

Mixson also reports: "We hope to have a product out by summer that

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O.M. Scott's expects to release a product that kills bahaiagrass in bermuda

will kill bahaiagrass in St. Augustine and bermudagrasses."

Bahaiagrass is the grass used by the Department of Transportation on Florida roadsides. It pops up a seed head about four days after it's cut, and it inevitably creeps into golf courses.

"The new product takes care of broadleaf weeds, too. We have the fine turf rights from the company that makes the initial chemical."

The new chemical is in the family of sulfanilureas like Hoelon. It works at very low rates, an ounce or less per acre. It will be dry flowable and can be delivered through irrigation systems.

•••

But new chemicals aren't all it takes to control weeds and have beautiful greens, Mixson emphasized.

"Most people — and most golfers — all they look at is the top green. The

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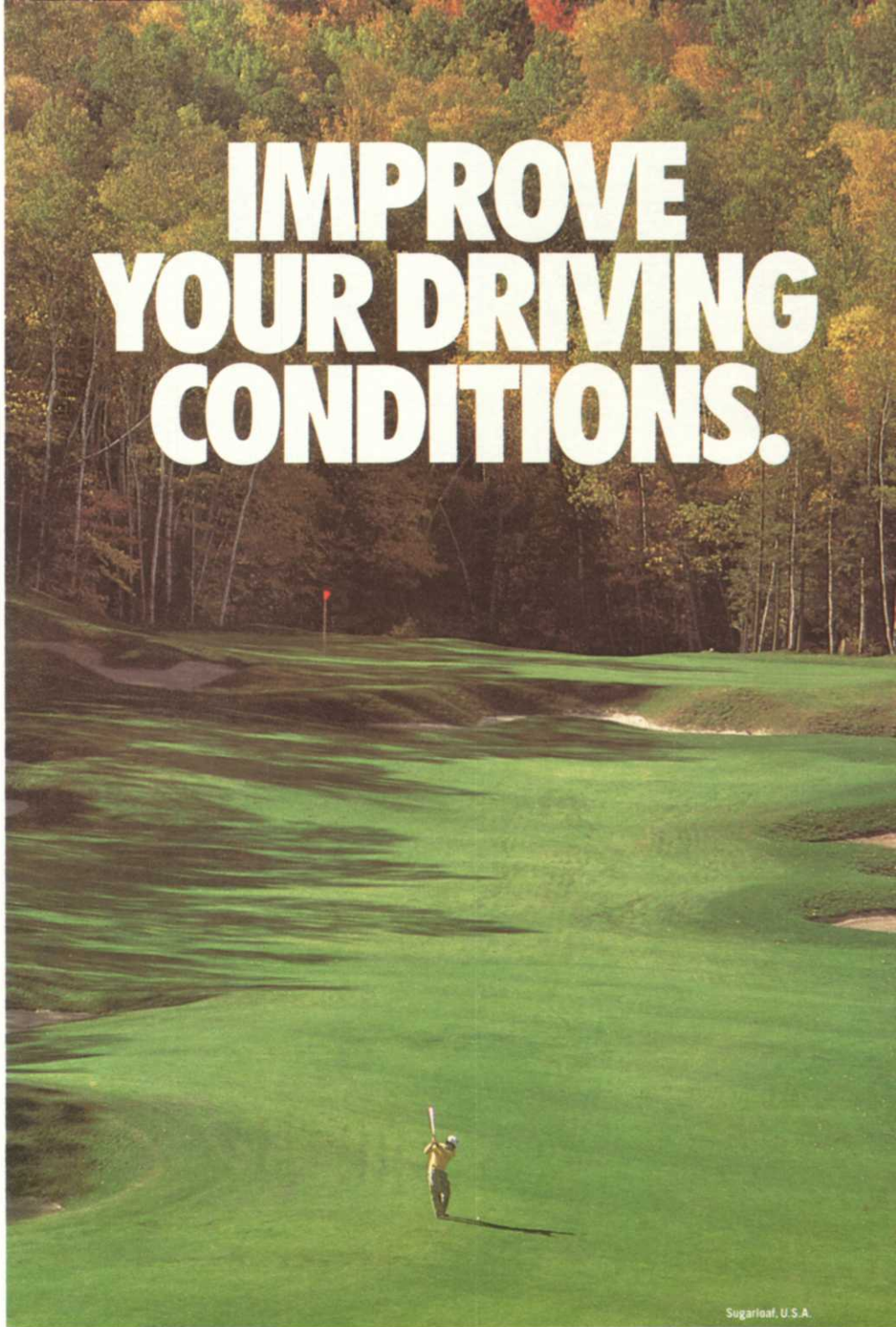
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DARCY MEEKER/IFAS

Teen wins Science Fair with mole cricket project

A project pitting a fungus against mole crickets won Donna Jaworsky top honors at the Science Fair at Palm Coast High School and for the region. Jaworsky varied strengths of the fungus for her entry in the state Science Fair in April. The 18-year-old senior's write-up will be included in the *Mole Cricket Annual Report* edited by Dr. Howard Frank, left, at the University of Florida's Institute of Food and Agricultural Sciences.

other half of the plant is roots and they're more important than the top green cover," he said. "Half of your weed control problem is solved by growing good turf."

•••

Dan Jones at Banyan GC in Palm Beach had to put up a sign to explain


the IFAS-FTGA mole cricket experiments.

"It looked like something from outer space," he said. "Now the members are 100 percent behind it, and always bring their guests to see the sign and the callers."

The callers attract mole crickets to

soil laced with one million mole-cricket-eating nematodes. Jones picked his worst mole-cricket area to be the research site.

The funny thing was, it also attracted armadillos, who went crazy over such a concentration of succulent mole cricket morsels. Now Dan put up a fence around the callers to keep the armadillos out. Most other clubs opted for a set-up that traps the mole crickets in a sand-filled bucket and allows them to distribute the infected crickets.

"Biocontrol is the wave of the future," Jones said. "If we don't get into this biocontrol, we're really going to be in big trouble. We won't have anything." 

MEET THE EDITOR



Darcy Meeker is assistant professor at IFAS of The University of Florida.



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