RESEARCH REPORT

Research for the '90s

Superintendents will have to bring the university onto the golf course to get the data they need

BY DAN JONES, CGCS

Banyan Golf Club in the western part of Palm Beach County was carved out of natural pine forest by golf course architect Joe Lee. To lose those pine trees would be devastating to our classic course, so the issue of pine tree decline has haunted me for the past 10 years.

In an effort to save the thousands of slash pine trees at Banyan, we have tried many stopgap measures over the years, such as applying sulfur to the ground under the trees to reduce the pH of the soil. With all our efforts, we still lost to 25 to 50 pines a year.

A few years ago, I came across an article by David Wedge telling about the research being conducted by Dr. Roger Webb on pine tree decline at El Conquistador CC in Bradenton. Webb was reporting a success rate of 98 percent after 10 months.

I literally jumped off the couch. This could be the answer for Banyan.

I called Webb the very next day and explained our problem with the pines. I asked if he would inject our trees in return for help with his research. He needed more data from south Florida, so we signed up.

We will be cooperating in his work for the next few years. During the last 10 months of this experiment, we have lost only one pine tree from the group that was injected.

Welcome to research for the 90s.

We can no longer expect the universities to give us all the answers. We must bring the universities to our golf courses. We are now the laboratories. We are the technicians. We are the caretakers. We are the funders.

Federal dollars are no longer available for turfgrass research and Florida has reduced the dollars for research and technical positions. We must look out for ourselves and for our industry; we must fill in the gap. If we do not, golf course conditions which our members have come to expect cannot continue.

Let me share with your how Banyan GC is becoming a part of research for the 90s.

First we have a greens chairman who shares the vision for research, one who supports our efforts 100 percent. Second, we have management that strives fore the best golf course possible within the budget. Third, management vision includes a commitment to enhance the environment as well as the golf course.

I heard of the breeding program Dr. Milt Engelke was conducting at Texas A&M on zoysiagrasses and heat-tolerant bentgrasses. Our greens chairman, Robert Jacobson, agreed that I should go to Texas and investigate Engelke's work. With the debate over the use of bentgrass in south Florida raging, he said we should be aware of developments on the cutting edge of research.

Want to get involved?

How can you get involved in research? It's easy. Researchers are always looking for people in the field who are willing to cooperate with their projects.
Call Bob Yount at the Florida Turfgrass Association in Orlando at 407-898-6721.
Contact the University of Florida in Gainesville at 904-392-7231 and speak to Dr. Ed Freeman.
In Fort Lauderdale, you should contact Dr. Monica Elliott at 305-475-8990.
If you are not sure how to get started, call the author at Banyan Golf Club, 407-793-0069 or drop by and see him.

As a result of the trip, Banyan was chosen as one of 12 sites in the United States, and the southernmost, to hold the bentgrass national trials. The other southern site was the Augusta National Golf Club. We also were selected for the national trials on zoysiagrass.

In April 1989 we received six varieties of zoysiagrass which we planted and replicated three times. Two of the varieties have performed very well: Cashmere and 8502. The latter cut at 1/8-inch looks excellent and survived 25-degree temperature Dec. 23 without going off color. Zoysia holds a lot of promise for tees, shaded areas and non-irrigated areas on golf courses.

In October 1989 we prepared a 4,000-square-foot green with 12 inches of sterilized greens mix. Engelke then came to the club with 24 varieties of hopefully heat-tolerant bentgrass seed. Each variety was replicated three times.

He planted the 72 5-by-10-foot plots using a sand/seed mixture and spreading it by hand, a back-breaking chore that took two days. All of the bentgrass germinated and by this past January, it was looking excellent when cut to 9/64-inch.

Engelke told us not to water the bentgrass any differently from the normal routine for our bermudagrass greens. He also asked that we apply no fungicides to the experimental green. We have had some fungus damage from time to time, but all except one variety has survived.

It is really difficult for a superintendent to stand by and watch grass die.

When I called Dr. Engelke to express my concerns, he was elated. "That is exactly what we want!" he said. "If one variety survives, we will be happy."

Scientists and superintendents sometimes think differently. Working together is the key to successful experiments, each one operating in his own area of expertise.

At Banyan we are also doing tests on hybrid buffalograss (prairie) to see if it will survive in southern Florida. After one year, with no water or fertilizer, it has doubled the original planted area and is surviving quite well.

Buffalograss could be used in Florida in non-irrigated roughs, along roadsides, overpasses and even on home lawns and it could be part of the answer to water restrictions in South Florida. It matures at 4 inches and tolerates no cutting or frequent cutting. I may plant buffalograss in my own lawn because

DAN JONES

Planting the 72 plots of bentgrass was a back-breaking chore that took two days.

of its low maintenance and great looks.

Mole crickets are enemy number one at Banyan. We lose large areas of grass to this pest every summer. Our only hope of controlling the mole cricket in the past was to spray the entire golf course with Nemacur every July at a cost of about $30,000.

The University of Florida is conducting research on controlling the mole cricket with biological parasites. They are using a nematode and red-eyed fly from South America, both of which are specific to the mole cricket.

By supporting the research of Drs. Howard Frank and Pat Parkman through the Florida Turfgrass Association, we are participating in this important biological research. To date, we have received a million nematodes and 200 red-eyed flies at Banyan. We hope that within two years, we will be able to control 85 percent of our mole cricket population without pesticides.

And finally, Dr. Monica Elliott, pathologist at the UF's Research and Education Center in Fort Lauderdale, is conducting field research on mushroom fairyrings using Benlate and Prostar.

Four major projects on one golf course. And it wasn't very difficult to get involved. And we are on the cutting edge of research for the 90s.

Mole cricket project wins science fair

The University of Florida's drive to unearth natural enemies of mole crickets has uncovered several promising fungi.

Now Donna Jaworsky has won science fairs in Palm Coast, Flagler County and at the state level by demonstrating that a fungus delivered by a bait can kill mole crickets.

IFAS

Donna Jaworsky

She didn't use the real enemy fungi. They are native to Brazil, just like the pests themselves (mole crickets native to the U.S. are not pests) and you can't be bringing in strange organisms without a lot of careful scientific folderol.

Using a similar fungus, however, Jaworsky demonstrated that a fungus delivered through a bait can kill short-winged mole crickets. *Beauveria bassiana* kills a variety of turf pests.

Earlier research at IFAS had demonstrated that one Florida strain of *B. bassiana* could kill mole crickets in the lab. If it would work in the field, there would be a lot of advantages: for one, a native fungus would already be adapted to Florida's cooler-than-Brazil winters. A fungus-water mixture had been poured on buckets of sand and mole crickets, and the mole crickets hadn't died.

Would a bait work?

Jaworsky set out to find out, with help from Howard Frank at the university and Dan Schrader at the IFAS Flagler County Extension Office.

She used a bait recipe IFAS had used before for delivering malathion to mole crickets. To the mixture of chickenfeed, crude cottonseed oil, sugar and water, she added varying doses of *B. bassiana*.

Her conclusion: The fungus-laced bait killed one third of the mole crickets.

Jaworsky finished by identifying questions that still need to be addressed:

- Would adding paraffin to the bait help preserve it and make it more effective?
- Will *B. bassiana* delivered through the bait system also kill other mole cricket pests?
- How do light, temperature, moisture and other environmental conditions affect the effectiveness of this control system?
- Is reproduction affected in mole crickets who eat the bait and don't die?

- Darcy Meeker

Three projects tapped for FGCSA research green

Grass has been planted on the research green, a joint project of the FGCSA and the University of Florida's Institute of Food and Agricultural Sciences at the Fort Lauderdale Research and Education Center.

Planted Aug. 1, it should be grown in by the first of November and the committee is already meeting to set priorities on research projects.

Says Kevin Downing, golf course manager at Willoughby GC in Stuart and chairman of the research committee, "Of 20,000 square feet in the research green, 10,000 are dedicated to IFAS for pure research. The other 10,000 are to be used directly by the FGCSA for product evaluation."

Tifdwarf covers 15,000 square feet and Tifgreen 328 covers the rest.

About 8,000 square feet are built to USGA specifications and another 2,000 square feet substitutes a geotextile fabric for coarse sand in the so-called

"choker" layer. The choker layer was omitted on the other 10,000 square feet.

Dr. Monica Elliott has put forth two proposals to research bermudagrass decline and diseases. In one, she will monitor bermudagrass roots in fumigated and non-fumigated areas for signs of these organisms which she thinks are introduced by sprigs.

Another project will look at what happens when you apply, time and time again, the new fungicides such as Bayleton, Banner and Rubigan. Called EBI fungicides for Ergosterol Biosynthesis Inhibiting, these compounds are used often because they work on bermudagrass decline. On the other hand, they can burn grass in hot weather.

A third project is the first step on the long road to develop biotechnological tools to improve bermudagrass. She will trace root-colonizing bacteria in fumigated and non-fumigated soil. "The long-term goal is to genetically engineer these bacteria so they would have a beneficial effect on bermudagrass," Elliott said.

- **Darcy Meeker**

Commercial nematodes lack stamina

Good guy nematodes are starting to look like green pastures to commercial producers, and superintendents are beginning to hear about this or that *Steinernema* nematode that can kill mole crickets.

But not all Steinernema are created equal, say Howard Frank and Grover Smart at IFAS. They offer this scorecard so you can tell the players.

Steinernema scapterisci are the ones that are working so well in the IFAS mole cricket experiment. Not available commercially, they were brought from Uruguay by IFAS researchers and are strictly experimental. Their advantage is that they reproduce in the tawny mole cricket, the southern mole cricket and the short-winged mole cricket. *S. scapterisci* (say SKAPTter-ISSky) start epidemics with continued killing power in mole cricket populations, Frank says.

By contrast, *S. glaseri*, *S. Bibionis*, and *S. carpocapsae* cannot.

Says Frank, "If these (non-*scapterisci*) nematodes are alive and healthy, they should be able to kill mole crickets about as effectively as a chemical pesticide, but there would be no lasting effect." *Steinernema carpocapsae* strains include Breton, Agriotos and all strains. Appropriate dosage would be about 800 million per acre, applied at dusk, and watered in well.

Because these good-guy nematodes cannot reproduce in the bodies of mole cricket pests, their white hat is small. They cannot multiply their killing power through the mole cricket popu-

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Patents fire ant fungus

IFAS entomology professor Dr. Jerry Stimac, above, recently gained a U.S. patent for a biological control for fire ants: a mixture of Beauveria bassiana fungus and rice. The patent, which is good for 17 years, covers not only its use, but also Stimac's method of isolation, formulation and introduction as a control organism.

Stimac, who has signed over the rights to the patent to the University of Florida, and UF officials have been negotiating with major pesticide firms to develop the fungus for commercial use.

The State of Florida has contributed more than $500,000 to Stimac's research over the past seven years.

lations.

Some superintendents attract mole crickets with a caller. Then they distribute S. scapteriski from the IFAS project by distributing mole crickets they have infected. It is a good delivery system for these microbe-bearing nematodes.

It has no benefits with the other nematodes.

"If you're using a caller, you might as well just drown the mole crickets you catch as use these commercial nematodes," said Frank. - Darcy Meeker