



The Florida Green

Fall 1995



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Hobe Sound

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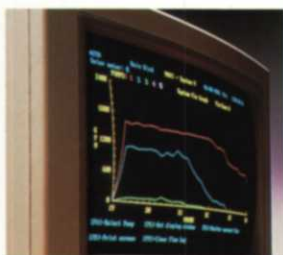
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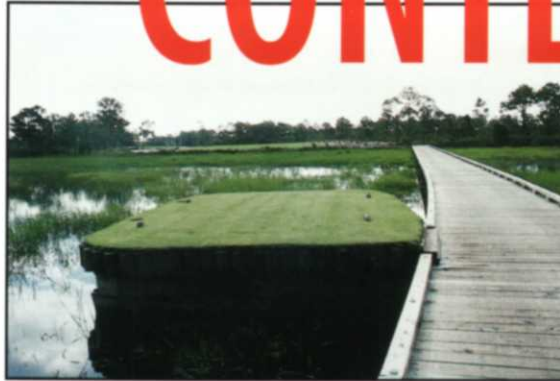
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Three cheers for Arizona Governor Fife Symington, who came forward and spoke about what I hope will soon become reality in our great nation.

Strong words about government and the environmental movement were heard from the governor on June 19 during an environmental policy meeting sponsored by the Heritage Foundation. If others believe in the governor's words as I do, then we will see overregulation of the environment come to a

screaming halt!

During this speech, Symington announced his support for the repeal of the Endangered Species Act. He noted that the act is a complete disaster and has become a tool for radical environmental groups to shut down industry. Also, his measures to help restore "self-government" decision about the environment deserve some looking into. These measures include:

- Imposing term limits on federal judges
 - Adopting a single coherent federal environmental policy
 - Streamlining the EPA by eliminating regional offices and establishing state offices co-located with the state agency. This would allow hand-in-hand decision making and eliminate a lot of second guessing.
 - Adopting expiration dates for all existing federal mandates that are of no use anymore.
 - Reviewing state laws mandating "environmentally conscious" public school curricula
- Reform such as what Governor

Symington is referring to is very much needed. The "environmental movement" as we see it today needs to be redirected. It indeed has some merit to it, but for now it is full of irrational reasoning. Respect for human nature must be given back to the people now. Who are better stewards of the land than those who live and work and play on that very land. It is time to return responsibilities when it comes to environmental protection back to the people.

On a more personal basis, I would like to thank all of you wonderful people in and around the little town of Hobe Sound who have made my move to the east coast an easy transition. At times, when I lived in Tampa, I would comment about how I never wanted to live on the east coast of Florida. Now that I am here, all I can say is, "Try it — you'll like it!"

To all of my friends back in the Tampa area that I never had the opportunity to say good-bye to, I want you to know one thing — the West Coast Chapter will always be very special to me. It is a great association, loaded with a lot of good superintendents and backed by a lot of vendors who truly care about our business. I miss you all, but remember — I am only a phone call away.

I am very much looking forward to serving as president of the FGCSA this upcoming year, but I am going to need some assistance from all of you. Anyone wanting to serve on a committee, please give me a call. The FGCSA is only as strong as the people who work for the association. Let's all get involved and work together in making the FGCSA the best it can be.

Environmental movement needs redirection



Greg Plotner, CGCSA President
FGCSA

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The GCSAA annual chapter relations meeting took place on Sept. 9-10 in Kansas. The meeting was attended by most of the GCSAA's 114 chapters. This gathering occurs every year to help the board of directors decide the course the membership wants to take.

The major topics at this year's meeting were the chapter affiliation agreement and the desire to begin enforcing this agreement once again. Every chapter that is affiliated with the GCSAA has filled out this agreement.

Now the GCSAA wants to update the language in the agreement and add some additional requirements. Some of the new requirements include the incorporation of each chapter, liability and D&O insurance and tax exempt status.

But the issue that drew the most fire was the time table for 100% GCSAA membership for class A, B and C members as a requirement for a chapter to remain affiliated with the GCSAA.

It was voiced by all in attendance that 100% membership in both the GCSAA and a local chapter was an ideal goal. The difficult part of this meeting was how to achieve this goal and how long it should take to get there.

The time table that was originally proposed would require all affiliated chapters to have 51% A, B and C membership in the GCSAA by the year 2000, 75% by 2005 and 100% by the year 2010. For some chapters, this seemed an impossibility; for others, it did not reach 100% quickly enough. Some delegates at the meeting accused the board of "scheming," and concocted grand tales of GCSAA plots to rule the world.

I am here to tell you I saw no evidence of "scheming" in Lawrence. The board was very open to all the concerns and issues raised by the new affiliation agreement.

They genuinely were looking for guidance on what to do with this proposal, as opposed to springing this on us at the national. By bringing these issues out at the chapter relations meeting, they were able to receive alternative ideas on how to approach this *ideal* that all chapters and members could live with.

After two days of intense meetings, it was proposed that after July 1, 1997, all new members wanting to join the national or a local chapter would be required to join both. This will require a bylaw change for the GCSAA and for local chapters.

GCSAA
sealing relationships with local chapters

Kuehner's Corner



Dale Kuehner, CGCS Vice President



Gathered in front of the GCSAA headquarters are Florida GCSA representatives, from left, (front row) Dale Walters, Geoff Coggan, Marie Roberts and Dale Kuehner. In the back row, from left, are Craig Weyandt, Roy Wilshire, Paul Crawford, Ed Guzman and Chip Fowkes.

All current members of the GCSAA or a local chapter would be grandfathered in, unless they move to a new chapter or try to rejoin after letting their membership expire. This approach seemed to be the best way to achieve 100% local/national membership without alienating any of our current members.

The bylaw issues to implement this approach at the national level will most likely come to a vote in Orlando. Florida and most, if not all local chapters, already meet most of the other new affiliation requirements. Each local chapter wanting to affiliate with the GCSAA will need to change its bylaws to require new members to join the national.

I personally think that having 100% local/national membership throughout the country will only make us stronger and better-equipped for the problems our profession faces in the future.

I will be representing Florida as your voting delegate in Orlando in 1996 and need as much input on this issue as you can give. The chapter affiliation agreement issues will be discussed at the next state board meeting in October.

Please feel free to call me or your chapter's external vice-president to discuss any ideas you have concerning this matter. This will ensure that your views will be represented at the board meeting.



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Scenes from the 1995 Crowfoot Open



YEARS OF UNIVERSITY TESTS SHOW CYPRESS POA TRIVIALIS AS THE SUPERIOR CHOICE FOR OVERSEEDING!

Since 1991, Cypress Poa trivialis has had a proven record in university trials for being better and different than comparable varieties. Differences such as a darker genetic color, faster establishing rate, and better disease resistance.

Instead of taking our word for it, here is what the experts have to say...



Cypress' prostrate growth habit is apparent in these P.V.P. trials. One picture is worth 1000 words.

TMI will be happy to send to you copies of the complete trial data for any of the trials we have mentioned below.

University of Florida 1991-92 Overseeding Trials Gainesville, Fla.		
	Mean Quality	
	Scores	Color
Cypress	7.2	7.8
Sabre	7.2	5.4

University of Arizona 1992-93 Overseeding Trials		
	Mean Quality	
	Scores	Color
Cypress	5.4	5.3
Laser	5.0	5.0

USGA Stimpmeter tests at University of Arizona revealed a higher average ball speed of 92 inches for Cypress; better than for Laser.

"Although Cypress and Sabre Rough Bluegrass had equal seasonal Turf Quality Ratings of 7.2, the 'Cypress' cultivar had better color and less dollarspot disease in May."
Univ. of Florida Gainesville 1991-1992 overseed Trial.

Turfgrass	Monthly and seasonal mean values for turf quality on cool-season grasses overseeded on a 'Tifdwarf' bermudagrass putting green from Dec. 1993 to Mar. 1994 at Gainesville, FL.				
	Dec.	Jan.	Feb. Quality Rating	Mar.	Mean
Cypress	6.8	8.2	8.0	6.8	7.25a
Colt	7.1	8.2	7.8	8.5	7.19a
PT-GH-92	6.3	7.8	8.0	7.1	7.19a
LPT-CT (Loft)	6.6	7.8	8.0	6.8	7.16a
PT-GH-89 C11 (Dark Horse)	8.1	7.3	7.8	7.0	6.97a
Danish Common	7.5	8.2	7.5	5.8	6.94a
LPT-HWY (Loft)	6.6	7.7	7.9	8.2	6.88a
Winterplay	6.6	7.5	7.8	6.3	6.88a

Quality mean based on eight visual ratings on a scale of 1-9 where 9 = best

Establishment rate of Poa trivialis varieties overseeded on dormant bermudagrass in Florida (data from Dr. A.E. Dudeck, Univ. of Florida)			
days:	7	14	21
	—% ground cover —		
1991			
Cypress	2	23	79
Sabre	2	17	70
1992			
Cypress	87	93	86
Laser	36	58	83

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Bay Hill hosts 19th Crowfoot Open

BY JOE ONDO, CGCS

The 19th annual Crowfoot Open took place at Arnold Palmer's Bay Hill Club. The weekend started on Friday with a seminar by Richard Kithil on lightning protection for courses. Mr. Kithil discussed helpful ideas on how to protect golfers, computers, pumps, phones, controllers and other aspects of the maintenance program.

At the FGCSA board meeting on Saturday, GCSAA President Gary Grigg discussed and sought input on the proposed GCSAA Chapter Affiliation requirements. He recommended that all concerned chapters be represented at the GCSAA Chapter Relations meeting in September in Lawrence, KS. (See *Kuehner's Corner, Page 6*)

Kevin Downing and his research committee should be applauded for all the hard work being done on the DNA project and the FGCSA Research Green that will benefit all superintendents and others in the industry for years to come.

President Scott Bell's presidency came to a close as new officers were elected as follows: President, Greg Plotner; Vice President, Dale Kuehner; and Secretary-Treasurer, Joe Ondo.

On Sunday evening Dan Riley, with a little help from closet comedian, Larry Kamphaus, entertained all the banquet attendees. Congratulations to Tom Benefield for receiving the FGCSA Distinguished Service Award for 1995, and to all the President's Award winners: Mike Barger (South Florida), Paul Frank (Ev-

erglades) and Billy Wright (Palm Beach).

Tournament results. The mysterious hex that the Ridge Chapter has on the Crowfoot Open continued as they once again took team honors. Mark Hopkins, Buck Buckner, Alan Puckett and Steve Ciardullo were masterfully "coached" to victory by Roy Wilshire.

Host superintendent Dwight Kummer and staff had the challenging Bay Hill layout in top condition for the tournament.

A special thanks to all Diamond and Gold sponsors and par 3 and putting contest sponsors for their support of this event.

Also, thanks go to Larry and Vilma Kamphaus and the Crowfoot Committee for another successful event.

OPINION -

Equipment companies need parts on the shelf

Most superintendents will agree that you are only as good as your people and equipment. We all know good help is hard to find, and it seems the more superintendents and mechanics I talk to, the more I hear that replacement parts for equipment are also hard to find.

A common question we are all asking our equipment salesmen is, "Why don't you stock at least the most in-demand parts?"

The problem is not just common in Florida — it exists worldwide. In June I met with a panel of golf course superintendents from all over the world for a research and development meeting for an irrigation system manufacturer. In our discussions about parts and service, the topic quickly changed to turf equipment, parts and service.

The general remark was that distributors were not able to get parts to courses fast enough. This comment, however, was secondary to the question of why distributors don't stock the most common parts.

We all agreed that it should be easy to track the most in-demand parts with inventory computers. We also agreed that

If a supermarket didn't keep a good stock of its most popular items, it would greatly effect their patronage. The same could be said for this situation.

we would be more apt to purchase equipment from a company that had a great reputation of parts availability, because we consider parts availability a key component of service.

One superintendent used this comparison: If a supermarket didn't keep a good stock of its most popular items, it would greatly effect their patronage. The same could be said for this situation.

The theory of the 48-hour parts plan is good on paper, but consider these two points.

First, you must call your order in before a designated time, which raises the question of what to do about equipment

that breaks down at the end of the day.

Second, the companies that deliver the parts work five days a week, and the last time I checked most of us were working seven or eight days a week, so if you order parts on Thursday afternoon you may not get them until Tuesday morning.

The salespeople working for the distributors work hard to earn our \$20,000, \$40,000 or \$100,000 in equipment we buy, and then they listen to our frustration when we don't get the service we expect. It may cost the distributor a little more to stock parts but the risk is minimal when the odds are the part won't be on the shelf more than thirty days.

In our industry, when we encounter problems like this we have to find a way to be heard. Remember, you are giving them your money. The distributors need to earn our business through quality and service. In this situation the best way to be heard may be to quietly change our purchasing habits. A drop in sales gets a lot of people thinking.

*Rob Kloska, GCS
Jupiter Island Club*

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*Occurs when stresses such as Rhizoctonia and Pythium species combine with heat, traffic and other factors. This results in reduced turfgrass vigor.



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Paul Frank: The Wilderness Man

BY MIKE MONGOVEN, CGCS

A short visit to the Wilderness Country Club is all it takes to discover what Paul Frank values. An adjective to describe this most important factor would be "wilderness."

He lived the New York State Audubon Cooperative Sanctuary Program long before there was such a thing. Starting in Paul's office and continuing across the property of Wilderness Country Club, are many examples of naturally-occurring beauty. These range from deer, alli-

Paul is a quarter-century member of the GCSAA, a former Florida Turfgrass Association Director and was a founding member of the Everglades Chapter.

gators, turkeys, rattlesnakes, eagles, bobcats, woodpeckers and chuckaluske chickens. When a person is in this environment, it is hard to imagine that some people actually believe that golf courses are a detriment to the environment.

Paul has lived his entire life on the property that is now the Wilderness Country Club. When he was born in Naples in 1934, it was a booming metropolis of 768 people, and that was all of Collier County. Mosquito control in those days consisted of holes dug in the swampy woods so that they would retain water through the entire dry season. The minnows that survived would then take care of the mosquito larva.

Paul was the original golf course superintendent of the second golf course in Collier County, the Hole in the Wall Golf Club. When he and his father built Wil-

President's Award Winners : 1995

Mike Barger
Paul Frank
Billy Wright



Paul Frank

derness, there was a standing order with the construction crew that no tree would be removed unless absolutely necessary.

Paul is a quarter-century member of the GCSAA, a former Florida Turfgrass Association Director and was a founding member of the Everglades Chapter. Asked about the early days of the Everglades, Paul remembers how close-knit the mem-

'Guys are too often motivated to put their jobs in jeopardy by trying to satisfy a small percentage of their membership,'

bers were. "Everyone was always ready to help," he said. "Our code of ethics was one that we all truly cared about and we had respect for one another."

Paul cites two things as his greatest accomplishments. First is his pride in building a beautiful golf course where others can really enjoy nature. Second is his discovery and propagation of PF-11, an off-type bermudagrass he found in one of his Tifgreen putting surfaces. The

When Paul and his father built Wilderness, there was a standing order with the construction crew that not a single tree be removed unless it was deemed absolutely necessary.

grass has many positive attributes.

His greatest concern about the golf business is the trend of golf course superintendents to get hero complexes. "Guys are too often motivated to put their jobs in jeopardy by trying to satisfy a small percentage of their membership," Frank said. "This process often damages the health of the turf, as well as the job security of the golf course superintendent."

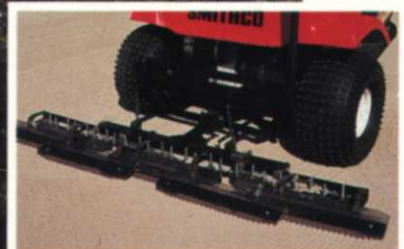
Friends and colleagues praise Frank for his commitment and professionalism. As Clint Smallridge, CGCS, sums up, "Paul is just a terrific guy. He shoots from the hip and talks from the heart."

Paul Frank is a living example of what is good about the golf course business. He has set a high standard we should all strive to emulate.

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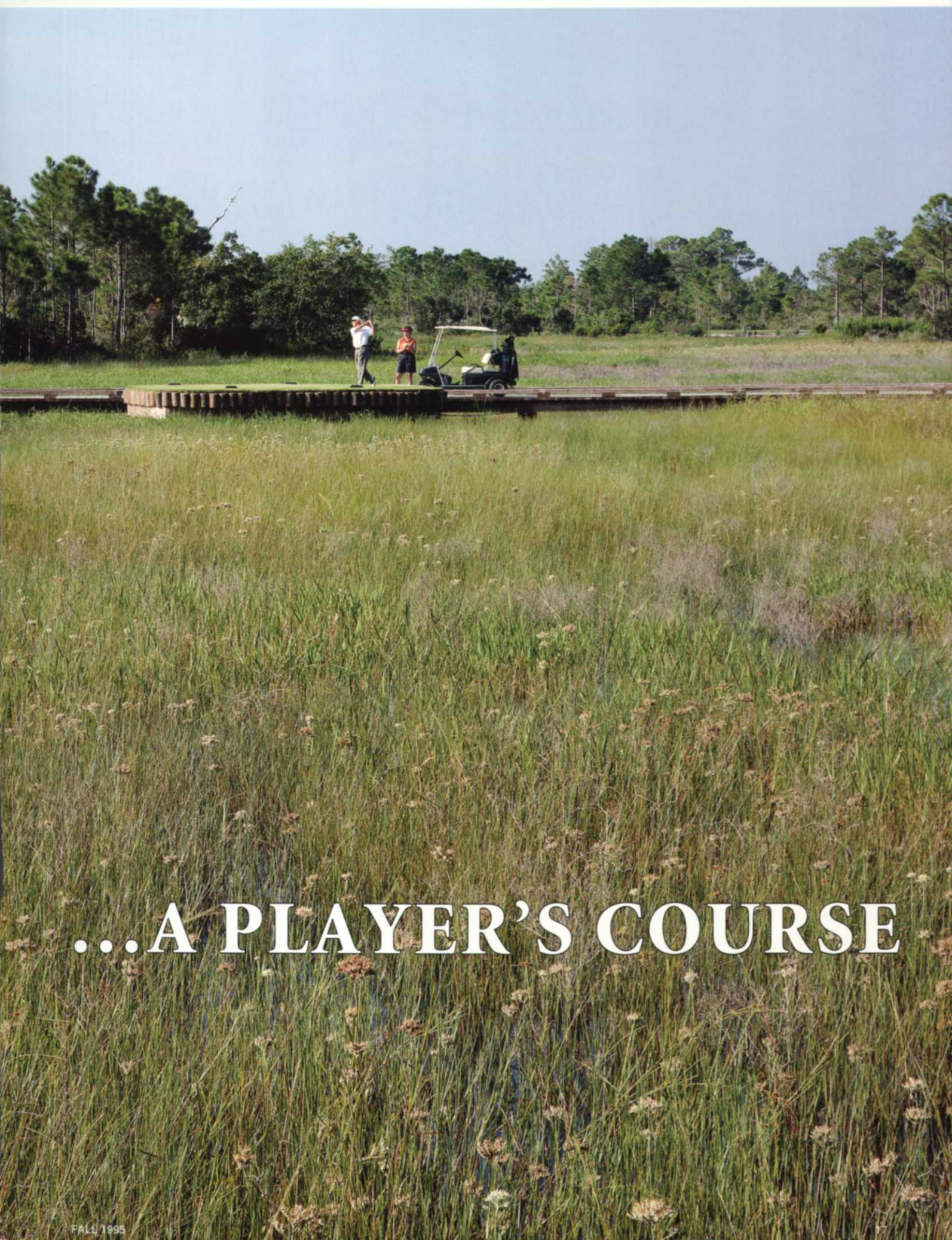
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...A PLAYER'S COURSE

THE MEDALIST GOLF CLUB

Risk, reward, shot selection, course management and creativity required

BY JOEL D. JACKSON, CGCS

GOLF COURSE PHOTOGRAPHY

BY DAN ZELAZEK

'No artificial signage or accessories. Small cut up branches for tee markers. Simple split log benches at the tees. No concrete. No asphalt. All natural.'

Photo on previous two pages:

The Medalist Golf Club

Hobe Sound

Hole #9

Photo by Dan Zelazek

"This is a player's course. The highest member handicap I've seen is a 15," says Greg Plotner, CGCS. It is quintessential target golf created in this pristine setting by Pete Dye and Greg Norman. Risk. Reward. Shot selection, course management and creativity required. The seven acres of Tifdwarf approaches and greens surrounds inviting all sorts of bump-and-run and pitch-and-run shots. Caddies are available.

The Medalist Golf Club holes wind back and forth like emerald ribbons through the sandy pine woods of Hobe Sound. Forty acres of turf nestled strategically among the palmettos and scrub oaks. The unique scent of wild rosemary thickets giving the visitor a gourmet's "taste" of the course to complement the sights and feel.

No artificial signage or accessories. Small cut up branches for tee markers. Simple split log benches at the tees. No concrete. No asphalt. All natural. The crushed shell paths, leading from the greens to the next tees, stop at the fairways. The subtle rolling and undulating fairways rising and falling, twisting and turning through the trees and around the marshes. There are no roughs. Native grasses, deer moss, wildflowers and aquatic plants punctuate the natural areas and marshes with texture and color contrasts. Stacked sod wall bunker faces offer a unique feature seldom seen on a Florida golf course.

There are many unique things about The Medalist and that suits Superintendent Greg Plotner just fine.

"Your work is never really done on a golf course, but after nine years at Tampa Palms, I'm enjoying the construction phases of this project," Greg said.

"It's not often one gets to help create and leave his mark upon the land. I really

like it."

Greg gives his wife, Nadene, and son, David, a lot of credit for his being at The Medalist.

"This move is a tremendous opportunity for me at this time. But to take advantage of it, I needed the support of my family," he said. "Like so many others, we were a two-career family with an active teenage son. We talked about the pros and con's, and they backed me 100% to make the move. I can't tell you how proud and grateful I am for their unselfish support."

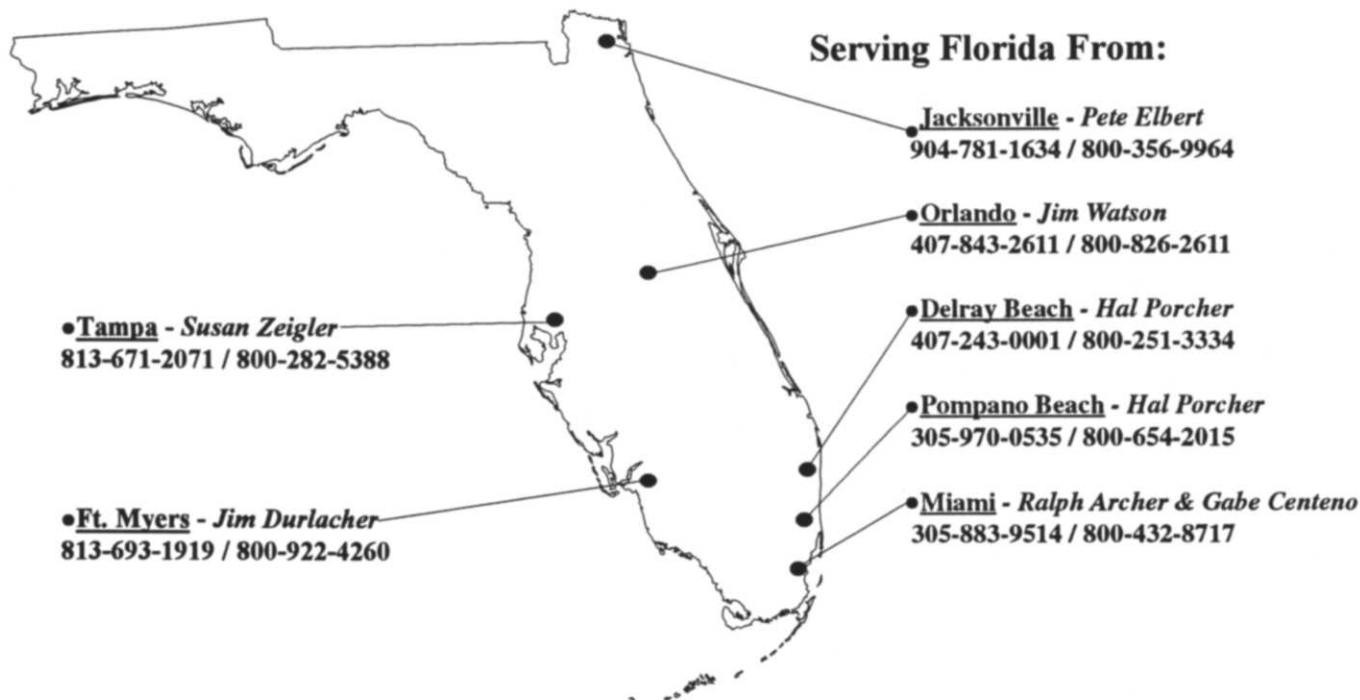
Greg's plate is full as he takes on the task of finishing the construction and grow-in of The Medalist, and at the same time assumes the presidency of the FGCSA. Another unique aspect of this story is the recent entry of Greg's boss, Greg Norman, into the turfgrass industry by starting the Greg Norman Turf Company.

Norman has shown a keen interest in working with the FTGA and in becoming very involved in the Audubon Cooperative Sanctuary Program. It is always refreshing and heartening to find out that you have a proven golf champion that is interested in the finer points of turfgrass management. We welcome Greg Norman into the fraternity of turf professionals and we appreciate his support.

My visit to The Medalist was on the Friday after Tropical Storm Jerry drifted nonchalantly across the state. If you looked west you could still see the backside of the slow moving system, purple-gray with rain. In fact, I drove down from Orlando through bands of overcast and rain.

It wasn't until I passed Vero Beach that I caught a glimpse of a sunrise trying to break through the leaden sky. We are once again approaching record rainfalls

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Above, Hole #4. An emerald target in a sea of sand.

Photo by Daniel Zelazek.

*Hole #6.
Nestled among the
pines and palmettos.*



Photo by Daniel Zelazek

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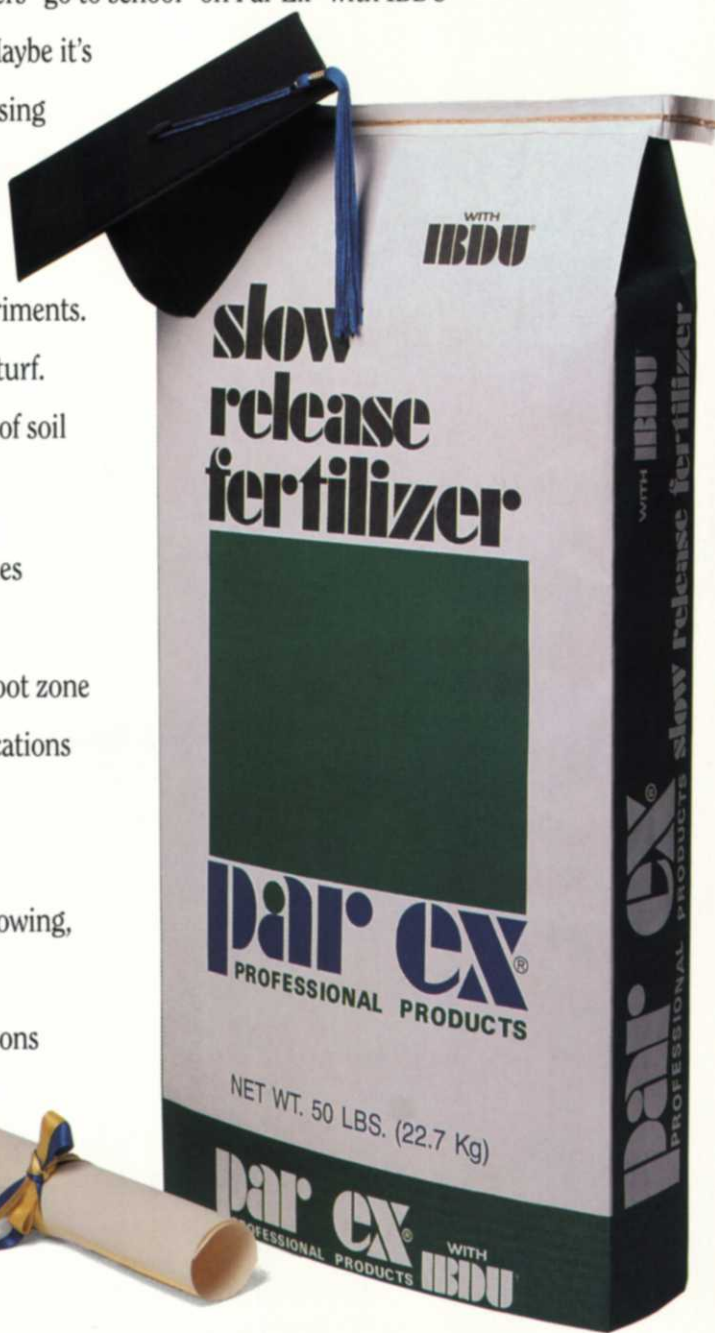
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Close mowing is a way of life at The Medalist

There are no plans to overseed the course in the winter, so it will play firm and fast

for the second summer in a row and we all need a break to grow some good turf before fall.

Excessive rainfall was exactly what was challenging Greg on this morning. We hopped in his golf cart and headed for the primary retention area and irrigation lake for the course.

"We are required to contain all of the storm water that falls on the course under the original guidelines of the permit. All of our drain basins are interconnected and pumps deliver all the storm runoff to the retention area," Greg explained.

"Unfortunately, the retention area does not have enough capacity for these severe thunderstorms. We are in the process of redesigning and enlarging the retention lake.

"After the modifications, we are going to be able to direct some of the runoff into a wetlands rehydration system approved by the South Florida Water Management District. Currently, the only option I have to deal with the overflow is

to flood the driving range, and that's a no-win solution."

As we rode the course, I was pleasantly surprised at how well it drained. The morning rainfall had percolated quickly except around some of the drain basins which were working slowly because of the capacity shortfall.

"Actually the soil drains so well that we have to really keep an eye out for the large areas of Tifdwarf. I have seen some spots turn blue in a matter of hours on a hot day. It almost reminds me of managing a bentgrass green in the summer," Greg added.

Close mowing is a way of life at The Medalist. With a fleet of twenty hand mowers, sixteen triplexes, and two 5-gang lightweights, the tallest cut is only 1/2 inch, and that is for summer fairways. There are no plans to overseed the course in the winter, so it will play firm and fast.

Those large Tifdwarf approaches we mentioned earlier extend out 10, 20 and 30 yards from the green and create yet



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Hole #12. Note the natural accessories on the tee blending with the woods and wetland.

Photo by Daniel Zelazek



Hole #11. Stacked sod bunker walls are definitely a different look in Florida.

Photo by Daniel Zelazek



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Photo by Joel Jackson

Greg Plotner shows Shelly Foy the bordered bunker walkway on hole #4. Note the crushed shell cart path in the background.

another management challenge.

At the Tifdwarf and 419 boundary, bio-barrier fabric and an edging slit have been installed to prevent 419 encroachment into the Tifdwarf. The bio-barrier fabric extends ten inches deep and prevents the stolons from growing under the Dwarf. The edging slit allows for mechanical cutting of any surface runners that try to grow over the top. Greg says they run the edger a couple of times a week in the summer when the 419 is most aggressive.

As I mentioned earlier, there are no roughs. The fairway cut stops abruptly at what Greg calls a *hard-line edge*, which is the look that is desired. The area beyond that is a cleared, natural sandy area which must be kept weed free except for the native grass accents. Right now Greg is experimenting with Round Up, Gallery and Barricade. He says they will do a little more under brushing along the deep woodline before the October 15th opening. He supplements the native pine needles with pine straw to prevent *fried egg* lies in the sandy areas.

We all live and learn with each project,

and The Medalist is no exception. The lesson of proper plant selection was learned. The folks who were hired to salvage and replant indigenous native grasses mixed upland and wetland species. Broom sedges planted on a mound under irrigation grew so much they blocked focal points and altered shot values. Everything is being sorted out and each species is being relocated into its proper habitat.

Back to some of those unique things about The Medalist. Stacked sod wall bunkers. I have read about them. I have seen pictures of them. Now, I have been up close and personal with them. For an old flymow man, Greg is finding managing them a bit of a challenge.

"They have been labor intensive for us," Greg said. "Some of the Dwarf walls dry out and collapse. We have experimented with rebuilding with clay based sod, if you can find it, and putting terra cloth between the layers. That has helped.

"We are also trying Tifgreen 328 for a little more aggressive rooting. Another problem is the stolons and roots that grow out and trail down the face. We're

trying to work out a solution. After all, it's a different grass type than is normally used in this application."

Speaking of bunkers. The bunker sand is mostly native sand, which packs nice and firm. There's an interesting feature in some of the large bunkers that guard an entire side of a green: a bordered walkway from the cart path to a ramped foot path on the side of the bunker face. It appears to be some 1-by-4s buried on edge defining the walkway. A ball coming to rest in the walkway is dropped in the bunker without penalty.

Greg has a couple of fairways planted in a new bermudagrass called GN-1. So far, he rates it excellent for preventing weed encroachment. Even more interesting is the lack of mole cricket activity compared to same age Tifway 419 fairways. The only problem he has encountered is maintaining color on some areas. It may be a simple case of an iron or manganese deficiency.

Conversely, on the 419, Greg has been battling some fairy ring problems. Potassium applications have helped prevent rampant mushroom development. Monthly soil and tissue samples have not revealed any obvious causes. A Pro Star fungicide application cleaned up a fairy ring outbreak on the greens.

As we finished our ride through the course, Greg showed me the clubhouse site overlooking the eighteenth green.

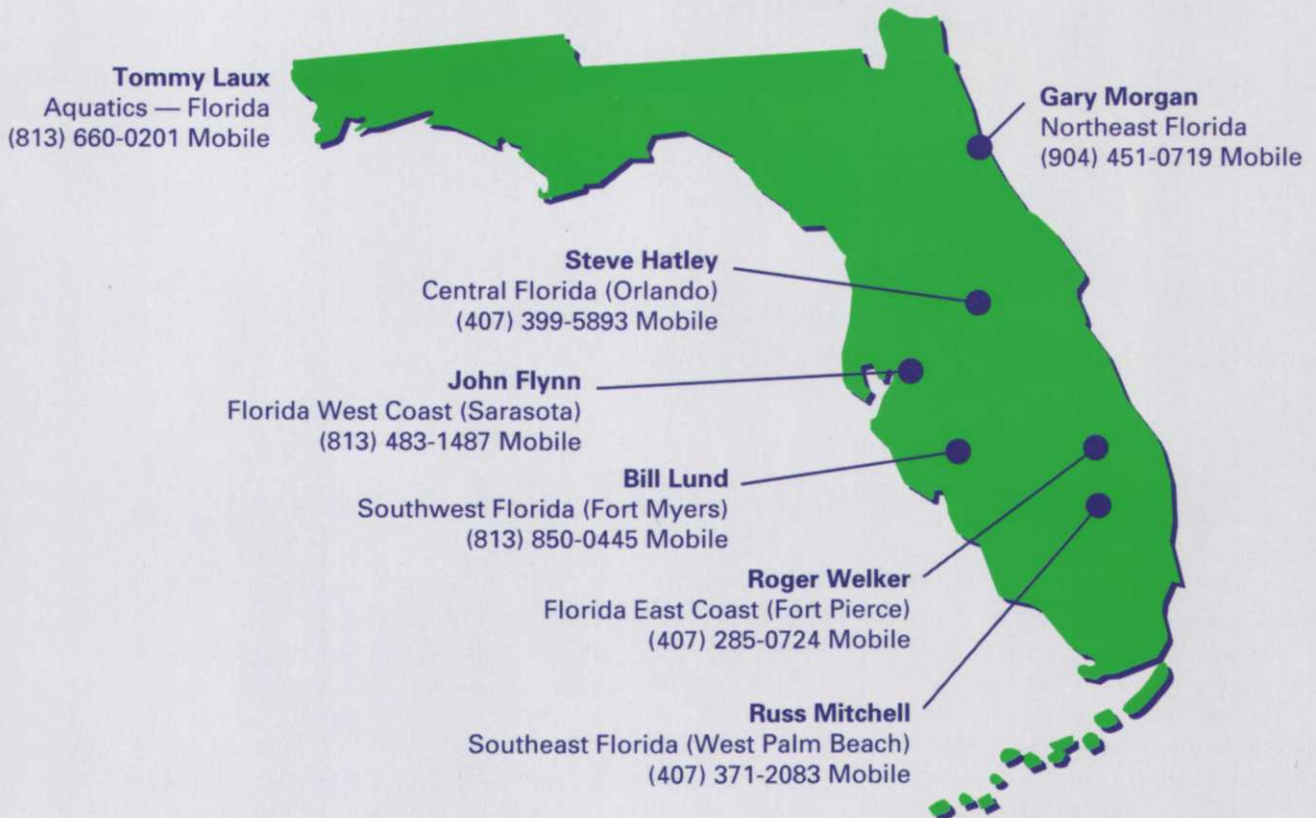
"The clubhouse should be ready by April first," he explained. "There will also be eight cottages for guests. Right now we are going to have to move some more soil to build the practice green so it will blend into the putting surface of number eighteen. It will be similar to the layout at Oakmont. At the same time we have to build a retention area to collect the runoff from the clubhouse area. So, you can see we have lots to do around here for awhile!"

It was exciting and interesting to see this new course taking shape in the Southeast Florida woods. The vision and dreams, the hopes and expectations of new owners and a new superintendent becoming a reality. A player's course for people dedicated to golf.



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Photo by Joel Jackson

Greg Plotner points to the edger slit access that allows management of the 419 Tifdwarf contact zone in front of each green.

GREG PLOTNER, CGCS

Originally from: Lincoln, Illinois

Family: Wife, Nadene. Son, David, 13.

Education: B.S. in Plant and Soil Science, Southern Illinois University, May 1981.

Employment: Irrigation technician, Wadsworth Construction, 1 year. Assistant Superintendent, Sweetwater CC, Sugarland, Texas, 4 years. Superintendent, Tampa Palms G & CC, 9 years. Superintendent, Medalist Golf Club, May 1995 - present.

Hobbies/Interests: Fishing, golf.

Professional affiliations/Offices held: Current President of FGCSA. Past President of Florida West Coast Chapter. Past Chairman of Green Industry Advisory Council, Southwest Florida Water Management District.

Honors: 1993 National Winner of Environmental Stewardship Award, Best Private Course (Tampa Palms). First certified Audubon Cooperative Sanctuary Program in Florida, (Tampa Palms). CGCS status since December 1991.

Memorable moment: Caddying for Arnold Palmer on opening day at Tampa Palms.

Personal philosophy: Work hard, but take time to enjoy life. Sometimes it's hard to do but it must be done.

Introduction to the business: My Grandma Plotner always told me about a cousin of mine who built golf courses for a living. Well, I met that cousin, helped build a course and here I am today at the Medalist Golf Club — proud as can be!

Mentors: The road to success started with my mother and father. They provided me with a good upbringing, a quality education and constant support. Next comes my family. New opportunities sometimes require relocation — Nadene and David have never said no. I love them more than words can say for allowing me to advance my career.

Advice: Get a quality education. Work for a proven superintendent. Develop good relationships with others in the field. Be a leader and act like someone who you would want to work for.



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Photo by Dan Zelazek

Managing clean, hard-line, fairway edges and native soil roughs will be one of many unique challenges on Hole #3.

The Medalist Golf Club

Location: Hobe Sound, Florida

Playing policy: Private

Management: Golf Professional, Buddy Antonopoulos

Designed by: Pete Dye and Greg Norman

Constructed by: Jason McCoy

Opened: January 1995

Acreage: Total turf = 40 acres.

Greens: 1.8 acres, Tifdwarf. HOC = .120 - .150. Average size = 4,350 square feet. No overseeding. Green speed 8.5 or better.

Tees: 2.2 acres, Tifdwarf. HOC = .250 - .375. No overseeding.

Fairways: 25 acres, 419 Bermuda and GN 1. HOC = .375 - .500. No overseeding.

Approaches: 7.77 acres, Tifdwarf. HOC = .250 - .375. No overseeding.

Irrigation Source: Effluent, groundwater. **Equipment:** Rain Bird Maxi 5, Flo-Tronex Variable Speed Pump Station.

Staff: Total of 24, including superintendent. Assistants, Charlie Jones and Howard Hulsebosch.

Unusual conditions: Two types of fairway grass planted, 419 and GN 1. More than 11 acres of Tifdwarf to maintain. Maintain stacked sod wall bunker faces.

Grow-in incident: Hosted Shell's Wonderful World of Golf, March 1995.

Mowing/Maintenance equipment: **Greens/Tees:** Walk mowers, 20 units total. **Fairways:** Off-season, 3235 John Deere, 2 units. In-season, Lesco Tri-Plex, 16 units. **Approaches:** Lesco Tri-Plex, 16 units.

Cultural/Pest Control/Fertility programs: Practice IPM. Use organic and slow release fertilizers as much as possible. Monthly soil and tissue sampling.

Wildlife management programs: Limited clearing of native areas. Mitigation underway for created marsh areas. Restoration underway for upland areas.

Water quality management: All storm water and irrigation water must be contained and not allowed to discharge into wetlands at this time. Eventually a new retention system will be in operation for the course which will allow for stormwater and irrigation water to be treated on-site and then used to rehydrate wetland areas.

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Loblolly Pines
Clubhouse and
Hole #18

ACSP

In six prior installments, each of six categories of the Audubon Cooperative Sanctuary Program for golf course certification were presented. In this follow-up article, a single course's successful approach to certification is reviewed.

ONE WITH NATURE —

Loblolly Pines Golf Club

BY SHELLY FOY
USGA GREEN SECTION

I go to Nature to be soothed and healed, and to have my senses put in tune once more.

- John Burroughs (1837-1921), American Naturalist

To those of us who are fortunate enough to spend time on a golf course, whether it is every day with our jobs, or occasionally for pleasure, no where is the above quote more evident. ➔



Note the bahiagrass buffer on Hole #15 which requires less maintenance and provides habitat for cotton rat, rabbit and quail.

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Whether BANOL[®] Fungicide is used as a preventive or curative treatment, the secret to its success lies in its ability to protect plants from within and to disrupt the normal growth of pythium. Although a powerful, systemic fungicide, BANOL has also proven to be safe for use on all kinds of turf.

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AS A CURATIVE TREATMENT, the same BANOL can be applied at higher application rates to control this fast-moving disease. BANOL won't wash off and maintains a residual effect (protecting plant crowns, roots and tissues), yet BANOL shows no sign of resistance development over time.

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When it comes to stopping pythium, BANOL[®] Fungicide speaks for itself.

IMPORTANT: Please remember always to read and follow carefully all label directions when applying any chemicals.

In July of this year, they became the 4th fully certified Cooperative Sanctuary in Florida

In Hobe Sound, Florida, golf and nature blend together in a special place called Loblolly Pines Golf Club. For Loblolly, there is but one philosophy: **one with nature.**

Loblolly is a residential development and private club with 200 members. The property is located on a sand ridge just west of the mangrove swamp flood plain of the intracoastal waterway. There are 305 acres consisting of 200 acres of non-play area, 50 acres of fine turfgrass and 55 acres of rough. Loblolly Pines is surrounded by several hundred acres of sand pine/scrub oak stands to the north, wetlands to the east and residential property south and west of the golf course. There are approximately 28 acres of woodlands (scrub oak and slash/sand pines) and 20 acres of open water.

In March, 1992, Dick Gray, then superintendent of Loblolly Pines, now in the middle of construction of The Florida Club in Stuart, joined the Audubon Cooperative Sanctuary Program for Golf Courses (ACSP) and took that first step of sending in the Resource Inventory. In February of 1995, Loblolly became certified in three categories and then in July, they became the fourth fully certified Cooperative Sanctuary in Florida.

The following is a summary of the information submitted by Loblolly Pines Golf Club in their quest to become a fully certified Cooperative Sanctuary.

One of the first and the most important steps in the ACSP is forming the resource committee. Loblolly is fortunate in that they have so many talented people that are a part of their family.

NAME: AREA OF INTEREST

Ralph and Mabel Vogel: Research of new environmental practices for area wildlife, liaison for Landscape & Architectural Review Board, wildlife inventory.

John and Janey Pratt: Resident watch of animals and birds; such as current migrations and wildlife sightings, Garden Club liaison.

Bill Wigton: Habitat resources, wildlife inventory.

John Jones: Nestboxes.

Tom Lucido: Habitat Naturalization, Publicity.

Dick Gray: Course Superintendent, ACSP Project Coordinator.

John and Susan Sullivan: Educational displays, golfer awareness of Audubon project, Photographer.

"The Resource Committee is extremely critical to the life of the movement. Superintendents come and go, members move, changes are inevitable. So it is very important that a large network of people are involved." — Dick Gray ➔

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Snags provide habitat for cavity dwelling birds like this yellow-shafted flicker.

WILDLIFE AND HABITAT MANAGEMENT

Philosophy: *One with nature. Leave it alone or restore it to its original condition.*

Below is a list of things that Loblolly does to encourage wildlife and habitat enhancement:

- Homeowners are required to dedicate rear 30 feet across their lot to a native buffer.
- Dead trees are topped and left standing on the golf course; branches are dropped and left for cover.
- Homeowners are encouraged to plant native plants which attract birds.
- There is a 20-foot buffer edge along lakes and ponds.
- Maintains specific habitat by replanting only with native species. Have planted over 2000 slash pines, sand pines, loblolly pines, southern red cedar and wax myrtle.
- Removal of invasive exotic plant material.
- Maintain wildflower areas on and around the golf course.
- Planted bahia buffer between bermuda fairways and native periphery which serves as habitat for cotton rat, rabbit and quail.
- Preserved extra acreage for gopher tortoises.
- Piles of coral rock and trees were added along lake banks for cover.
- Osprey platform constructed on golf course (have had sightings, no nest to date).
- Nest boxes include: wood duck, kestrel, owl, and bat.
- All lake areas provide cover for aquatic residents. ➡



A gray fox. One of many mammals calling Loblolly Pines home.



In December of 1994, the Ocean Course at Sea Pines Plantation was closed for a complete renovation. The Ocean and Sea Marsh courses share pro shop and driving range facilities. The driving range was closed for renovations, also in December, and members and guests at both courses were compelled to use the driving range at Harbourtown Golf Links. Naturally, there was a big push to re-open the driving range facilities as soon as possible.

We had already decided to use the ROOTS 1-2-3 Program to enhance our grow-in on our greens, so in order to facilitate the opening of the driving range, we decided to use 1-2-3 on the driving range tee.

As we finished sprigging the driving range itself, we had extra sprigs so we doubled the rate on the right side of the range, i.e., left side 400 bu/a, right side 800 bu/a. We then decided to use ROOTS 1-2-3 on the left side, in addition to the tee area. The left side caught up and passed the right side and the tee area grew in so well we were able to open early.

We are extremely pleased with the results from using the ROOTS 1-2-3 Program.

Jim Cregin, Superintendent
Bart Miller, Assistant Superintendent
Ocean Course, Sea Pines Plantation
Hilton Head Island, South Carolina



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'Our goal is to completely eliminate contamination of ground water from pesticide applications'

PUBLIC/MEMBER INVOLVEMENT

Philosophy: *On this blue pearl, we are all accountable. Every effort is measurable, every animal is an owner. Everybody must be involved, the younger the better.*

• Hosts the Blue Pearl Tournament in cooperation with the Treasure Coast GCSA. In 1994, \$9,000 was donated to the Treasure Coast Wildlife Hospital. In 1995, \$8,000 is being put into the ACSP for schools.

• Displays ACSP registration, wildlife inventory, project info, etc.

- Regular articles in club newsletter.
- Member involvement in Nest Box project.
- Member involvement in native planting projects.
- Working on nature guide for members.
- Formed a garden club.

WATER CONSERVATION

Philosophy: *Water only as needed: it's easier to add than subtract.*

"Because we are located on a sand ridge, there are a few drawbacks. One is moisture holding capacity. Our yellow sand, basically our parent material, has a perc rate of 20 inches per hour. Our white sand, an 18-inch mantle over the yellow, percs 30 inches per hour. Consequently, irrigation water is a precious commodity." — Dick Gray

The primary water source for Loblolly Pines is a local water company, which supplies the property with 400,000 gallons of effluent daily. A secondary water source is a deep well which is used on an *as-needed* basis. The storage lake is lined so no water is lost through percolation.

Conservation methods utilized:

- Watering on an *as-needed* basis, deep and infrequent.
- Use of drought-tolerant grasses.
- Higher cutting heights.
- Higher tolerance to dry spots in fairways.
- Use of moisture retaining soil amendments and wetting agents.
- Thatch reduction.

- Mulch around newly-planted material.
- Fertility programs emphasizing root mass.
- Roughs are not watered.
- Native plant material only.
- Computer operated irrigation system governs volume and pressure; low-trajectory adjustable arc impact sprinklers utilized.
- Irrigation technician scouts the system weekly, checking for leaks and faulty heads.
- Nozzles are changed with the season, small in the winter, larger in the summer.

WATER QUALITY MANAGEMENT

Philosophy: *Our goal is to completely eliminate contamination of ground water from pesticide applications and minimize contamination from parking lot/roadway runoff.*

- Seven lakes, four are lined. All contain natural structure, coral rock, trees, etc. on the bottoms.
- Lakes separated from fairways by 10- to 12-foot border of 3- to 4-inch rough grass. This border serves as a filter from runoff into the lakes. On residential side, 20- to 30-foot natural buffer protects the lakes.
- Drainage from parking lots and roads percolates through high-sand parent material before reaches drains. Clubhouse parking drainage is directed into two sand traps and filtered into the water table.
- Annual water quality monitoring in place. Test regularly for pesticide residual, Biological Oxygen Demand (BOD), plus our basic water quality tests.
- Lakes were stocked in 1989 with bream, bass and catfish in all seven lakes, sterile grass carp in the lined lakes.
- Pond perimeters opposite of playing surfaces are allowed to develop naturally.
- Littoral shelves have been planted along all residential waterfront.



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'IPM is more than an on-again, off-again concept'

INTEGRATED PEST MANAGEMENT (IPM)

Philosophy: *To us, IPM is more than an on-again, off-again concept. It is our method of operation.*

"The original theme here at Loblolly Pines was *back to nature*. From the beginning, we were committed to a golf course and residences that appeared to be a part of nature. We wanted to build a golf course that simply *fit in, naturally*.

"Because of this desire we committed to a native buffer, as a means to frame each hole, that ranges from 30-foot to over 100 feet deep along the entire boundary of nearly every hole. To this we added native trees and grasses, along with a covenant in our POA agreement that restricts the use of exotics near the rear of any residence.

"So in effect, we have a 21,000-linear-foot ribbon of golf course, bordered on both sides by a thick native habitat of scrub oak, slash pines, sand pines, rosemary, cabbage palms, myrtle, native grasses and water, over 40 acres of habi-

tat, most of it continuous.

"Our original concept is still our concept. Not only does this concept stress the philosophy of co-habitation, it also stresses higher tolerance to pests. We'll live with a few more weeds; we'll tolerate more insect damage, we'll lower our standards in certain areas in an effort to reduce the use of pesticides and increase the number of birds, mammals, snakes, turtles, frogs, fish, etc.

"As to pesticide application, *as needed* is the code word. We apply pesticides *as a reaction to* and not *in case of* as a general rule. Scouting and record keeping have given us enough historical data that we can anticipate trouble. This allows us to nip it in the bud—or nymph stage. As for rates, we apply the lower third of the recommended rate and add whatever materials we can to increase our efficiency."

—Dick Gray

IPM practices utilized –

IRRIGATION:

- Effluent, nutrient rich, so algae is

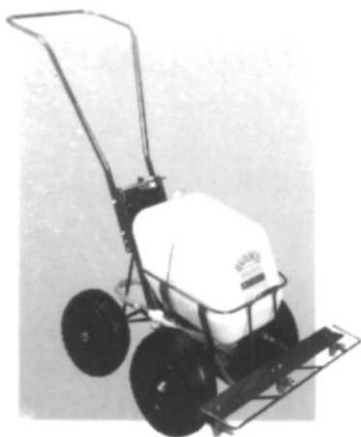
always a threat. To compensate, water is used only as needed, and the turf is never allowed to thin to the point of soil exposure.

- Judicious water use, cutting height, aeration and verticutting keep algae to a bare minimum.

FUNGICIDES:

- Keeping the course on the dry side also keeps fungicides to a minimum.
- When required, *as needed* only.
- Alternate contacts with systemics and combine them when possible to make fewer applications.
- The decision to use fungicides is made after determination that favorable weather changes are not probable.
- Raise cutting height during winter to compensate for chlorophyll shortage. This procedure reduces vulnerability to fungi and therefore reduces reliance on fungicides.
- Use of improved varieties of bentgrass and ryegrass.
- Judicious use of fertilizers. ➔

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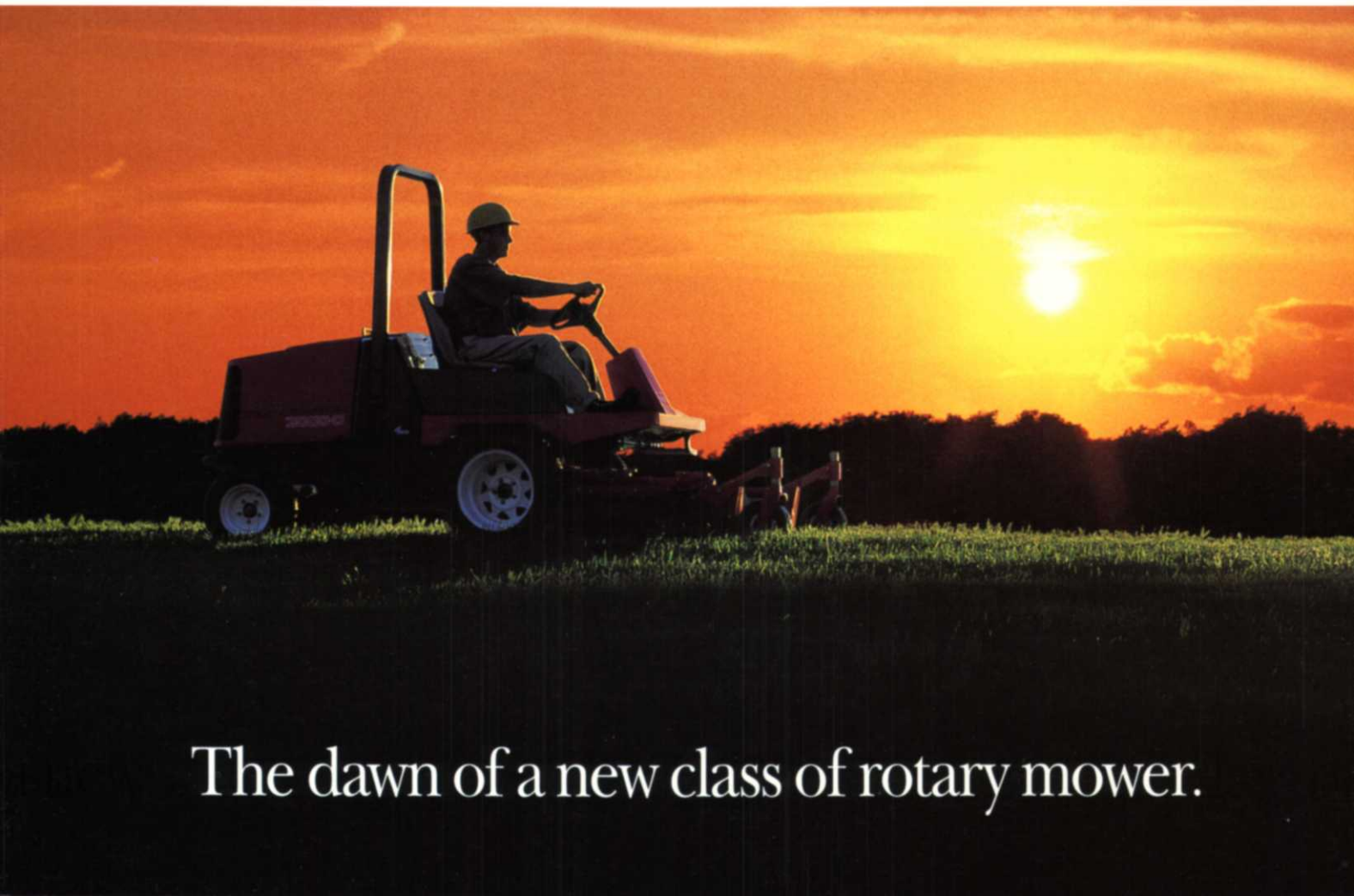
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The Toro Grounds can do more by noon than

We burned the midnight oil to spark the dawn of a new class of rotary mower. We overlooked nothing. Engine. Transmission. Cutting deck. Attachment system. Wheels. Everything it takes to make the Grounds[®] 3000 a rotary mower of unprecedented productivity.



Every inch a Grounds[®].

For almost 25 years, turfcare professionals have preferred Toro Grounds[®] mowers because of their proven productivity even in the most difficult cutting conditions. Add in their superb quality of cut and famous durability, and you have many of the family traits inherited by the new Grounds[®] 3000.

But every inch its own class.

It's not a replacement but an addition to the Grounds[®] family. The new 3000 is truly a new class of rotary mower. A giant step forward with more horsepower. A Guardian[®] Recycler[®] deck with 84 inch productivity. State of the art one or two speed axle with Integrated Hydrostatic Transmission (IHT) and PTO. An innovative quick-attach system. Ergonomic design. And more.

Starting with advanced cutting.

The 3000's advanced Guardian Recycler cutting unit is perfect for large formal areas. For example, its 84 inch wide coverage means 35% more productivity than a similar 62 inch deck. What's



Groundsmaster® 3000

in most mowers can do in a day.

more, it features hydraulic counterbalance, soft ride pneumatic castor wheels and a responsive design that adjusts to ground contours 15 degrees upward. To provide uniform flotation for a smooth, even cut. You can also standardize your cutting patterns because the deck's extra width gives you dual sided offset and trimability on both sides. More convenience: the Guardian 84" Recycler has new quiet castor forks that better follow contours and permit easy height of cut adjustments with one pin placement. And, of course, recycling dispenses with collecting and disposing of clippings. Boosting productivity even more.

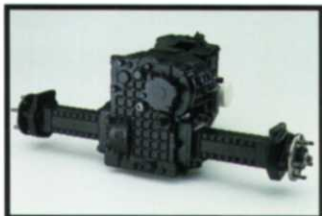


Combined with power to spare.

Take your choice. A rugged 33 hp, liquid cooled Peugeot diesel, two or four wheel drive. Or a 45 hp, gasoline fueled Ford engine renowned for its long life and vibration free performance. Either choice supplies power to spare and will transport your 3000 up to a brisk 15 mph.

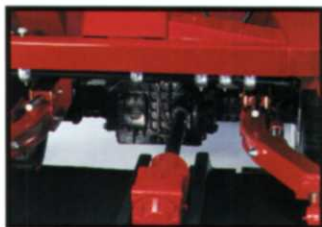
And precision transmission.

Toro asked Sauer-Sundstrand® to design an Integrated Hydrostatic Transmission (IHT) that performs with the power you need. It combines the transmission, axle and PTO in a single housing. A PTO, by the way, that drives either mechanical or hydraulic attachments. There are stronger, fewer parts. A greater direct transfer of power. And oversized hydraulic components that reduce heat and noise. This incredibly reliable transaxle has what it takes to move bigger decks and year 'round accessories.



Plus a new quick-attach system.

Toro's new quick-attach system makes implement changing a breeze. Just unlatch the lever of each lift arm, pull away the deck and you're ready to attach whatever implement you choose.



Fit for excellent performance.

A mower is only as good as its operator. So you'll find key features that make the Groundsmaster® 3000 and operator fit each other. Its lower center of gravity provides enhanced sidehill stability. It's noticeably quieter, too, due in part to the 3000's isolated platform. Vibration is minimal and hydraulic sound is masked. Easy to reach controls feature joystick finesse. Maneuverability that rivals smaller Groundsmaster® mowers. Plus more safety features including the optional integrated ROPS.



Catch a cab to all weather versatility.

Completely enclosed cab with ROPS loaded with standard features turns your Groundsmaster® 3000 into an all weather wonder. Easy on and off with only 6 bolts. Seals well and is visually part of the 3000. Lots of window for better visibility. Standard lights for early and late day operation. Low noise with isolated, rubber mounted platform. Options include heater, wiper and soft panels.

The Toro Groundsmaster® 3000 has all it takes to be in a class of its own.

- Advanced Guardian® 84" Recycler® cutting unit means 35% more productivity than a similar 62" deck.
- Hydraulic counterbalance, soft ride pneumatic castor wheels, and a responsive design adjusts to ground contours for a smooth, even cut.
- Quieter operation with 3000's isolated, rubber mounted platform, smooth-running engine, and oversized hydraulic components. Less vibration throughout mower.
- Powered by 33 hp, liquid cooled Peugeot diesel engine. Or 45 hp, gasoline fueled Ford engine.
- Integrated Hydrostatic Transmission (IHT) combines transmission, axle and PTO in a single housing.
- Enhanced sidehill stability with low center of gravity. Easy maneuverability. Many safety features such as optional ROPS.
- Quick-attach system means even more productivity. Just unlatch levers, pull deck away and it's ready to attach another implement.
- Enclosed cab seals out snow and rain. Easy on and off with 6 bolts. Lots of window for better visibility. Lights for dimly lit operation.

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perimeters not in play to
develop naturally provide food
and cover for this great egret.

Insecticides/nematicides:

- Season, target and weather determine timing of applications.
- Scouting programs in place, beginning the week prior to the full moon, starting in March and continuing through October.
- Three days before full moon, necessary pesticide applications made on *as needed* basis to flagged areas only.
- All applications are posted.
- Treat mole crickets *as needed* with applications made during the full moon. Feeding stimulants and detergents are added for increased control.
- Spot treatment.
- Toleration of nematodes, again with raised tolerance. The club accepts nematode damage as *part of*. Where possible, raised cutting heights to allow for more root mass and application of a little more fertilizer and water in these particular areas. ➡

'We are proud to have Loblolly as a fully certified course in our Cooperative Sanctuary program and commend their philosophy to manage land at one with nature'

Herbicides:

- With exception of one annual pre-emergent application, herbicides are applied only *as needed*.

- Do not water roughs, keeps weeds down. Rotary mowers are used in roughs to control broadleaf weeds.

- Lightweight mowers with high clip frequencies are used to ensure turf density, which results in fewer weeds.

- Judicious control of equipment and traffic patterns helps with weed problems.

- Hand pull weeds that can't be mowed.

- Sterile grass carp used in lakes.

- Blue marker dye used with applications to avoid overuse of herbicides.

- TOLERANCE is the key. We as a club accept species such as broadleaf, grassy, sedges, etc., as part of the natural Loblolly look.

- Pesticide applications always made with weather conditions in mind.

CLOSING

Jean McKay, Staff Ecologist with the New York Audubon says, "Loblolly is a unique property that illustrates that wildlife and golf courses can coexist. They've also taken this philosophy beyond their

course to the community through their Blue Pearl Tournament. This tournament raised money for local schools to participate in making their schoolyards more environmentally friendly. We are proud to have Loblolly as a fully certified course in our Cooperative Sanctuary program and commend their philosophy to manage land at one with nature."

Dick Gray: "Our original concept in 1987 was *Back to Nature*, and to a large degree this theme dictated design and construction of the golf course. We weren't unique in this. Several golf courses had the same philosophy, probably throughout the history of golf. The benefit we derived from membership in the ACSP is twofold. First, it validated our efforts and intentions to our members, which created a lot of member involvement. Second, their awareness allowed us to enhance our original plan. From this natural look, we were able to gain credibility for the Blue Pearl and additional publicity that golf courses can be environmental enhancements. Everybody wins. The critters win. Mankind wins. Golf wins."

Dick has left Loblolly and has moved up the road where he is now Designer/Builder of The Florida Club, which is

under construction with a proposed opening date of August 1996. One thing that we can be sure of is that the critters around The Florida Club are in good hands.

Fred Hinkle is now the Superintendent at Loblolly Pines Golf Club. Fred and Dick have known each other for more than 15 years and are from the same hometown in Indiana

When Dick knew he would be leaving to build the new golf course, he called Fred and asked him to come to Florida to take over for him at Loblolly. It hasn't taken Fred long to get attached to his surroundings.

"I have seen a lot of golf courses in my time, but Loblolly is special," Fred said. He added that Loblolly will **definitely** continue to work with the ACSP and that everyone there is very committed to this program. He also says that he has seen more wildlife stick around this year than ever before.

Does it have anything to do with their involvement in the ACSP?

"I do think it plays a role, sure."

So, the commitment to environmental enhancement continues at Loblolly. After all, it is their way of life; **one with nature.**

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 Great White Heron
 Great Blue Heron
 Cattle Egret
 Great Egret
 Snowy Egret

Common Egret
 Pileated Woodpecker
 Yellow Shafted Flicker
 Downy Woodpecker
 Red Bellied Woodpecker
 Common Galinule
 Blue Grey Knatcatcher
 Red Winged Blackbird
 Belted Kingfisher
 Vireo
 American Coot
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 Roseate Spoonbill
 Ring Billed Gull
 Louisiana Heron
 Chuck-wills Widow
 Great Horned Owl
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 Cormorant
 Anhinga
 Mottled Duck
 Royal Tern

Thrush
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 Gopher Tortoise
 Coach Whips
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Photo by Darren Davis

Hunker in a Bunker

BY JOEL D. JACKSON, CGCS

I'd like to thank the 30 superintendents who took time to share their bunker management techniques for this article by answering the Bunker Questionnaire that we sent out. Mike Hamilton, CGCS of the Grey Oaks CC also wrote a great article on how he has managed to reduce labor hours for bunker maintenance.

Playing conditions in sand bunkers, formerly known as *sand traps* before the USGA deemed the term politically or technically incorrect, are receiving more attention all the time. The chief complaint being that bunkers are too soft. Too many *fried egg* lies out there. And I suppose poorly designed and constructed bunkers can also be too wet if they don't drain properly. As we respond to the increasing demand for excellence, we find there are some basic guidelines that can improve our bunker conditions.

The number one critical factor that

will reduce or eliminate most of your problems is to use the proper sand in your bunkers. That answer is repeated over and over in the answers to solving soft and wet conditions. What is the proper sand?

The proper sand is the one you selected based on its physical properties: size, shape, composition, angle of repose, and color. These factors excluding color will dictate how well the sand will pack and firm up for that *perfect lie* we are asked to deliver. How often you rake and cultivate to produce the desired conditions is a matter of individual preference.

Your peers are using at least 10 different types of sand in their bunkers. I will list them here with definite concern for some of the choices. The number in parentheses is number of courses reporting:

Ortona 200 (3); **Standard's M-37** (7); **Standard ?** (4); **FM200** (3); **DOT** (2); **"220"** (3); **GASH 200** (1); **"180"** (1);

Jahna Trap (2); **Misc ?** (4).

I challenge you to call your vendor and get the exact specifications.

The respondents to the survey are basing their answers on maintaining as few as 22 bunkers to as many as 126 bunkers per 18-hole course.

All of the reporting courses use mechanical sand rakes. They are a part of modern golf course management. Hand raking is still used in steep pot bunkers and other green side bunkers by choice. Even the modest hand rake has undergone modification from a traditional rake with 2 inch tines to curved and cylindrical shapes with one-half inch teeth. Courses spend anywhere from 2.5 hours to 24 hours to complete one raking cycle: 37% of the courses rake bunkers four to six times per week; 30% rake daily; 30% rake three times a week; and 3% rake twice per week.

The choice of attachments was divided mainly between leaf rakes with or

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without tines; grooved flaps with or without tines; and the old cutter bars with flaps. It isn't surprising to find private clubs and public courses using different schedules. Resorts may only see their guests once and so they tend to rake more often. Private clubs tailor their routines to the members wishes and hopefully see a higher level of golf etiquette and participation than public venues.

Edging routines also varied widely depending on practices, available labor and expectations of the clubs. Weekly and bi weekly routines were common, followed by monthly and bimonthly to a minimum of three times a year. String trimmers, stick edgers, and reciprocating edgers have become the predominant edging tools.

Only four superintendents reported using non-selective herbicides to chemically edge bunkers. On the other hand, eleven courses reported using PGRs to reduce flymowing. Only four courses said they overseeded bunker lips.

On the issue of correcting soft bunker conditions, suggestions included: Using proper sand; reduce raking frequency and use of tines or cultivators; hand water; tamp; use granular wetting agents; tire packing (a PGA recommendation); drag mat and rental compactor.

Concerning wet conditions, the offerings are: Install drains; repair and flush drains; shovel silt and debris before raking; use tines to break up crust; increase use of tines and raking frequency; allow to dry before raking (USGA recommendation). For water damage and washouts the first response is judicious use of push blades on sand rakes to put sand back in place. Good old shovel and rake work is also required.

Chronic washout areas are corrected in the long run only by diverting runoff from the bunker or sodding or rebuilding a bunker face that is too steep. Remember "angle of repose" as one of those critical factors in sand selection? Construction sand has an angle of repose of 35 degrees. Any bunker face steeper than that defies the laws of physics. Golf course architects take heed!

Last but not least is a discussion of where to put hand rakes. Sixteen of the courses put the rakes on the course.



Photo by Darren Davis

String trimmers, reciprocating edgers and stick edgers (pictured) have all but replaced square point shovels and halfmoon spades for edging bunkers.

Nine said they put the rakes *in the bunkers*. Three said definitely on the course but *out of the bunkers*. Four more just said *on the course*.

For your information, the USGA recommends that rakes be placed outside of the bunkers. The other fourteen courses put the bunker rakes on the golf carts. The big drawback for rakes on carts is that golfers are forever forgetting to bring the rake back to the cart.

Cary Lewis at the Stouffer Vinoy GC has a great idea to help alleviate that problem. At the Stouffer, they have two remote rake stations stocked with extra rakes on holes #3 and #13. Those with rakes on the course cite member preference as the dominant reason followed by walking golfers. Those with rakes on carts cite aesthetics, theft, damage and labor savings as the reasons for their choice.

Bunker management is entering a new era. The demands and expectations of improved playing conditions includes bunkers. Materials, equipment and techniques are improving rapidly. I hope this overview helps. Check out the next article to see how Mike Hamilton solved some specific problems at his course.

Bunker Maintenance at Grey Oaks C.C.

BY MIKE HAMILTON, CGCS

At Grey Oaks Country Club we have 96 large bunkers with steep faces, so it has become essential for me to find ways to efficiently maintain them. With the help of a Trims computer program, I have always tracked the labor at Grey Oaks. The highest labor area has always been our bunkers.

In our first year of existence we spent 16,250 hours in labor on bunkers, which was 14.2% of our overall labor. The following year we spent 15,000 hours in labor on bunkers, which was 9.3% of our overall labor. This year that percentage is down further to 8.7%. How have we reduced the labor on our bunkers? With chemicals, new equipment and training.

It is truly amazing how far bunker maintenance has come since I was on a crew. On a good day three people could edge 15 bunkers a day.

Today, I can send two people out and they can neatly edge all 96 of my bunkers in one day. Wow! Now that is a big-time money saver. How is it possible to do

this? I stay on a scheduled program of chemical and mechanical edging, and also use growth regulators.

About a year ago I purchased a 15-gallon battery-operated sprayer with a coiled hose. At the end of the spray wand we attached an inverted funnel with square edges. Once a month, one person driving a utility vehicle and one steady-handed well-trained person using the spray device and a non-selective herbicide can neatly chemically edge all 96 bunkers in one day. Because the funnel is square and open ended, I do not get the jagged edge I used to get with a shield attached to a spray wand.

Chemical edging does not eliminate mechanical edging, but it does reduce it tremendously. Back in the old days, if we were to keep our bunkers neatly edged all the time we had to mechanically edge them 15 to 20 times a year. Today, because of chemicals, I need only mechanically edge bunkers four times a year. In the last few years I have discovered the *stick edger*. A stick edger is simply an



An inverted square-mouthed funnel attached to a spray wand gives a nice crisp edge when chemically treating bunkers.

Photo by Mike Hamilton

edger blade attached to a weedeater.

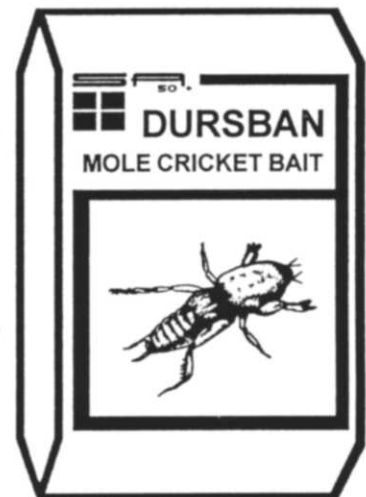
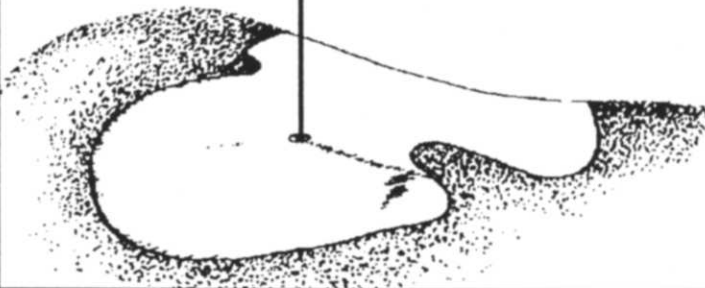
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has made mechanical edging fast and easy. One operator edging and one person with a leaf rake can edge and clean all

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Mike Hamilton demonstrates his modified version of the Flymow.

96 bunkers in a day, and if I am closed one person can do all 96 bunkers. The small amount of debris that is clipped off will be tilled into the sand the next day with the mechanical rakes.

Another big labor item for me has always been mowing the step bunker faces. When I first arrived at Grey Oaks, it took 84 hours a week to mow the bunker faces. Although my budget is not bad, it is by no means exorbitant, so I had to find a way to reduce that labor. By modifying my flotation mowers and with the use of growth regulators, I have reduced that 84 hours a week to 84 hours a month.

The worst part about spending all that time mowing bunker faces was that even though I was mowing them once a week, they were still always brown, either from scalping or stress due to the run off of water, nutrients and chemicals. I knew the higher I could maintain the turf, the easier it could cope with the stress of this severe environment. The problem was that the highest my flotation mowers would cut was 1½ inches. We came up with the idea of mounting a 1½-inch PVC pipe to the bottom of the mower to raise the height to three inches. The three-inch height seems to be a better one for the turf under the extreme conditions.

Growth regulators have also become a

part of my bunker maintenance program. Because we are cutting bunker faces at three inches, I can use high rates of the regulators without the turf going off-color. The higher rates allow me to mow the bunker faces on a monthly basis rather than weekly. The turf tightens up and rarely gets scalped when we mow it. At first, I was concerned that the three-inch turf would look out of place with our normal rough, but it doesn't. The slopes

are steep enough that very few balls get hung up in the face of the bunker. I get more compliments because the bunkers are green than I get complaints because someone lost their ball in the turf. The growth regulators also help me with my bunker edging.

I have my spray technician treat the entire edge of the bunker when he is spraying faces, and it reduces the runners in the bunkers tremendously.

I don't think enough can be said about how training employees properly can make any task more efficient. We spend a lot of time with our bunker crews to make sure we are getting peak performance out of them because it is such a labor-intensive area.

One of the most important persons on that crew is the person who does the chemical edging. If that person is not meticulous in his task, he could cause more work than he reduces. Make sure you spend a lot of time with that person, and make them realize how important the task is.

Using these techniques I have reduced our labor on bunkers by 5.5%, and our bunkers are always well-kept and manicured. That reduction in bunker labor has benefited the entire golf course, because we can concentrate more labor on other parts of the course.



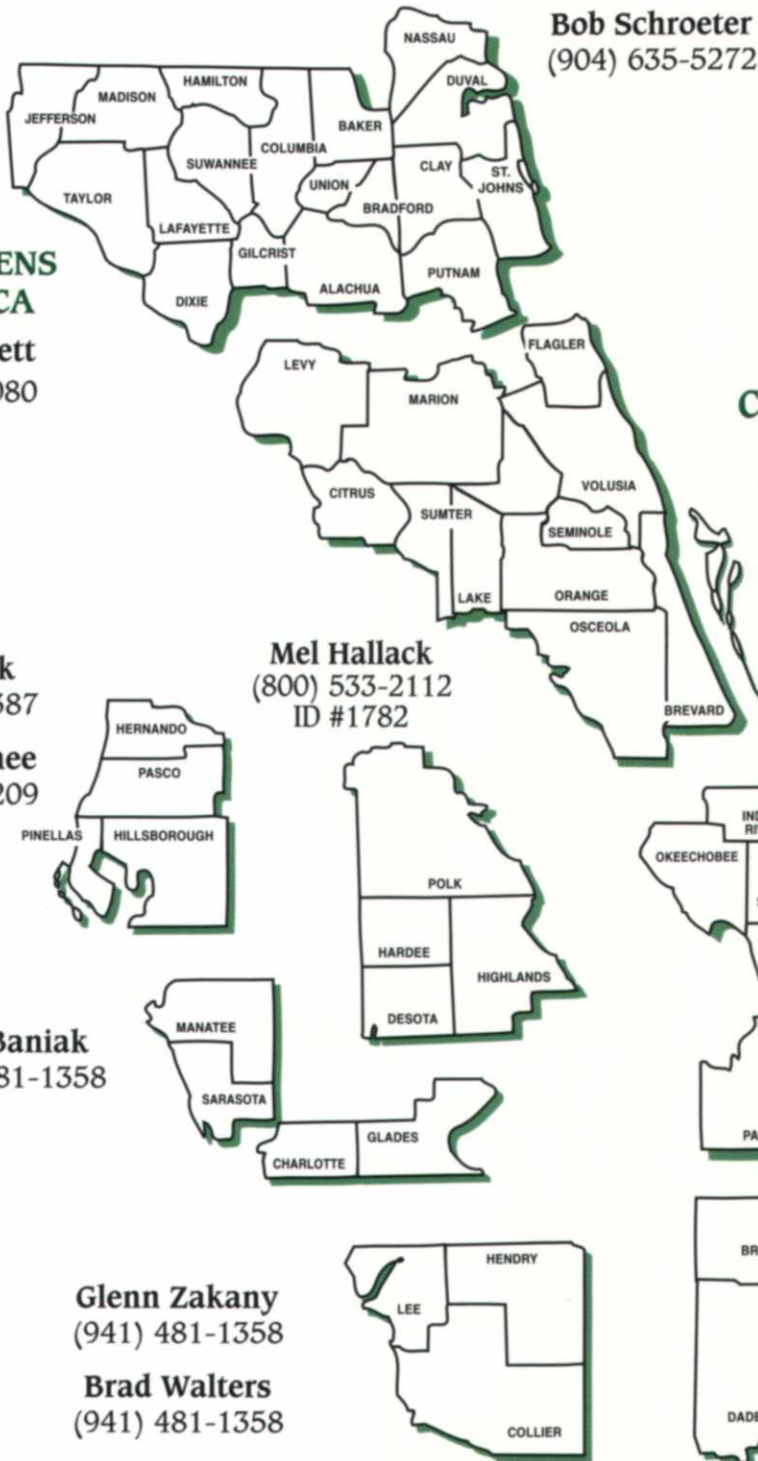
Photo by Mike Hamilton

Crew member, Gene Paul, drives while Jose Godines chemically edges a bunker at Grey Oaks with a modified spray wand attached to a 15-gallon electric sprayer.



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Blessed with mild temperatures year round and abundant light rainfall nine months out of the year, the Willamette valley is one of the nation's most fertile growing areas.

On the Oregon seed trail



Photo By Joel Jackson

Lofts' Turfgrass Breeder, Dr. Virginia Lehman, explains the lengthy process of getting a new grass variety from the research farm to the marketplace.

The Oregon Seed Trail

BY JOEL D. JACKSON, CGCS

You say, "Willa met." I say, "Will lamb it." But no matter how you pronounce "Willamette," a valley by any other name would not be the seed growing capitol of the United States.

Lying between Oregon's coastal mountain range to the west and the Cascade Mountains to the east, the Willamette River runs from Albany north to Portland. Blessed with mild temperatures year round and abundant light rain-

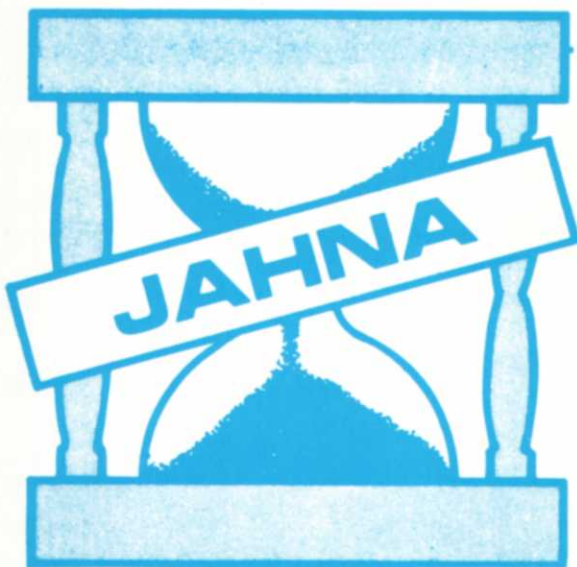
fall nine months out of the year, the Willamette valley is one of the nation's most fertile growing areas.

The Jackson family had the pleasure of touring the Pacific Northwest this past June. The trip was only for a week, so we each picked something special we wanted to see besides the gorgeous scenery. Susie needed to touch base with cousins in Seattle she hadn't seen in 40 years and a childhood friend now living in Walla Walla. My daughter, Jennifer, opted for Powell's City of Books in Portland, the



Sunbelt Seed's Joe O'Donnell is flanked by Great Western's Will Sheperd (left) and Jim Parsons (right) in a field of Palmer II ryegrass. Recent rains have the grass plants lying down.

Photo by Joel Jackson



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Hoping for dry weather, Joe O'Donnell inspects a field of Crenshaw bentgrass that is surrounded by acres of blueberries and mint on the Helms Brothers farm.

Photo by Joel Jackson

Touring the Lofts/Great Western Seed Company operation in Albany, Oregon

largest bookstore in the world. It covered a whole city block! Brother-in-law, Alan, wanted to sample some microbrew fare as well as visit the friends and relatives.

As for me, I wanted to see first hand the fabled Willamette Valley and its seed fields. Joe O'Donnell, General Manager of Sunbelt Seeds, was kind enough to arrange a tour of the Lofts/Great Western Seed Company operation in Albany, Oregon.

I must admit I wasn't sure that the rest of our merry band would enjoy the side trip to the seed fields. We were trying to think of alternative activities for the group, but we decided that the road to the spectacular Oregon coast ran through seed country and so they tagged along. My wife loves learning about how things are made and soon the whole group was into learning about the whole process.

The process begins when Lofts/Great Western contracts with independent local growers to produce seed. For 1995 they have contracts with 139 different growers to plant around 29,000 acres. The contracts are risky for the seed company because they are "by the acre" and not "by the yield."

Interesting to note that it only takes a quarter-pound of bentgrass to sow an acre field that should yield a ton, and about five pounds of ryegrass seed for the same result. Think about the rates we use! The results can vary from crop to crop creating shortfalls and overages, which ripples on down to the consumer.

Bob Richardson, vice president and general manager, took us on a walking tour of the blending, bagging, and shipping operations in Albany. While golf courses focus on those 50 pound bags coming off the back of a truck, we were shown machine after machine dedicated to filling 2-, 5-, and 10-pound boxes and bags for homeowner use.

The bagging plant was quiet on this day. After all, it was only June 19 and all this year's crop was still in the fields maturing on the grass plants. Questions about when they would be harvesting were met with anxious glances and concerned looks.

"This is not typical June weather," Bob said. "Normally the rains have quit by now for the summer and we can start thinking about when to cut the fields. The cuttings need seven to ten days to dry out before we harvest and clean. If it doesn't let up, we are going to get jammed up trying to cut, harvest, clean, blend, bag and ship to meet end user schedules.

"We are at Mother Nature's mercy! You fellows in Florida have a little bigger window and can seed a little later than folks north of you. The physical output capacity of our machinery is our limiting factor. We can blend, bag and ship only so much product in a 24 hour day. The sooner we can get started the better for you and for us."

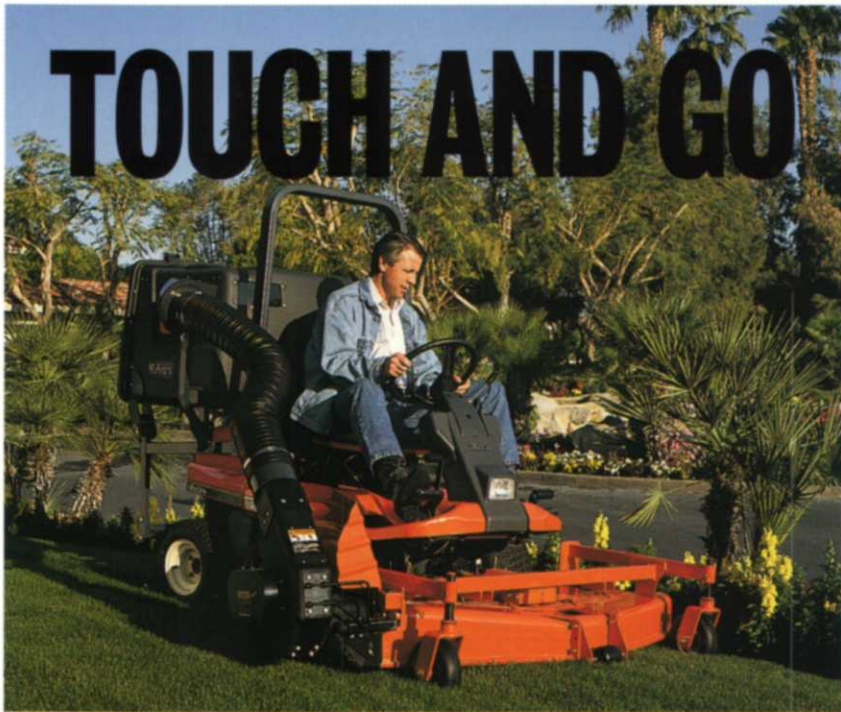
Another new wrinkle in shipping was shown to us as we toured the plant. It seems that the bulky wooden pallet we all know and hate is disappearing at least in some applications. Home and garden stores like Kmart and Home Depot don't have the time or space to deal with wooden pallets. They are being replaced with thin semirigid sheets of plastic. When the whole load is shrink wrapped it's easy to handle with a lift that has knife-thin forks attached.

We left the main plant and made our way to north to a cleaning plant operation. This is an independent operation that serves all the seed companies. The raw harvested seed is stored in deep bins and is moved around by suction lines and ducts.

Cleaning machines are like large vibrating sieves that glean out the chaff from the seed. Sometimes blowers are added to use air to separate out the seed. This is a time consuming step in the process and re-screenings can be costly. Once again, physical capacity of the equipment limits how much seed can be processed in a day.

I was flabbergasted to learn that the

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Photo By Joel Jackson

Recovery of 60% of harvested bentgrass seed is considered normal at a seed cleaning plant such as this one near Albany, Oregon. The tiny seeds are almost impossible to separate from the fine chaff.

‘...They use the cannons on the grass fields also when the geese are migrating. A flock can wipe out a field in a day.’

best they can do with bentgrass is to recover about 60% of the seed that goes through the cleaner. It is just so small that it is difficult and cost prohibitive to try to get more out of the process. Quite frankly, the current process and equipment just isn't sophisticated enough to get any better results.

Now we were ready to go see some of the grass fields. Our first stop was a Crenshaw bentgrass field on the Helms Brothers farm. The bentgrass should have been at least knee deep, but the rainy weather had it laying down to about mid-calf high. Seed heads were evident and it wouldn't be long, weather permitting, before cutting.

I heard what sounded like shotgun blasts in the distance. Then from behind a windbreak right behind us, BLAM! We must have looked white as ghosts as we flinched. Our guides, Joe O'Donnell, Will Shepherd and Jim Parson were stifling laughs and grins.

"Propane cannons," Will offered. "The blueberries are almost ready to pick and they're scaring off the birds! They use the cannons on the grass fields also when the geese are migrating. A flock can wipe out a field in a day."

Gee, those geese are a problem even before we plant the grass on a golf course! We

painstaking work that requires patience, perseverance and humor

zig-zagged out of the farm down dirt roads lined with all sorts of vegetable crops side by side with the seed fields.

Our next stop was a Palmer II ryegrass field. A crew of six people were roaming about in the field with burlap bags.

"They're rouging the field," Jim explained. "Notice how the grass is laying down from the rain? Also notice how some plants are standing more upright? That's a telltale sign of an 'off type.' They're looking for those upright plants and are manually removing them. A simple but effective method of quality control."

In fact, both Will and Jim are field representatives for Lofts/Great Western and they serve as liaison between the company and the growers making sure concerns are communicated and resolved.

They regularly inspect the fields for good management practices and purity. They both have Ag Science degrees and come from farming families. We had Jim identify some of the crops we had seen so far as we headed toward the Lofts Research Farm. After all, we had never seen hops, alfalfa, and canola in the raw before!

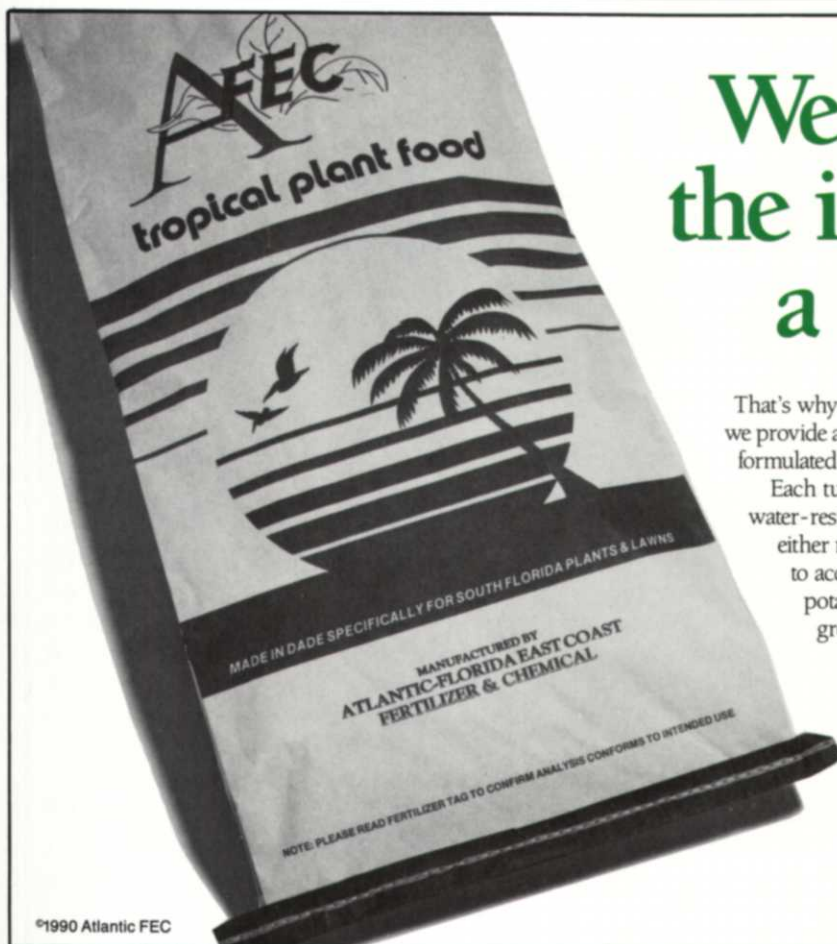
We twisted and turned down some back roads and ended up at the research facility in Lebanon, Oregon. I had met Dr. Virginia Lehman before at either the Lofts hospitality tent at The Nestle Invitational at Bay Hill or at a GCSAA conference. She gave us a chance to stretch our legs as we walked about the facility looking at the myriad varieties of grasses undergoing observation and selection.

Dr. Lehman described the lengthy process required to breed and select a grass

suitable for marketing. The repetitive process of replication of a desired trait and selecting only the best plants of each generation for testing and field trials takes anywhere from five to ten years minimum. It is painstaking work that requires patience, perseverance and humor. Dr. Lehman has all three.

We all broke bread together for lunch. Got to know each other a little better and then the Jackson clan headed for Newport on the coast for some views of that beautiful, rugged and rocky coastline.

We had spent a great morning learning about a part of the turf business we probably take for granted. It sure has given me a new outlook on that wonderful wacky world of overseeding we look forward to every year.



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Dark green genetic off-type (T-3) appeared in patches on a Florida fairway in 1993, 2 years after Tifway bermudagrass was supposedly planted. The surrounding matrix grass (T-1) is yellowish green.

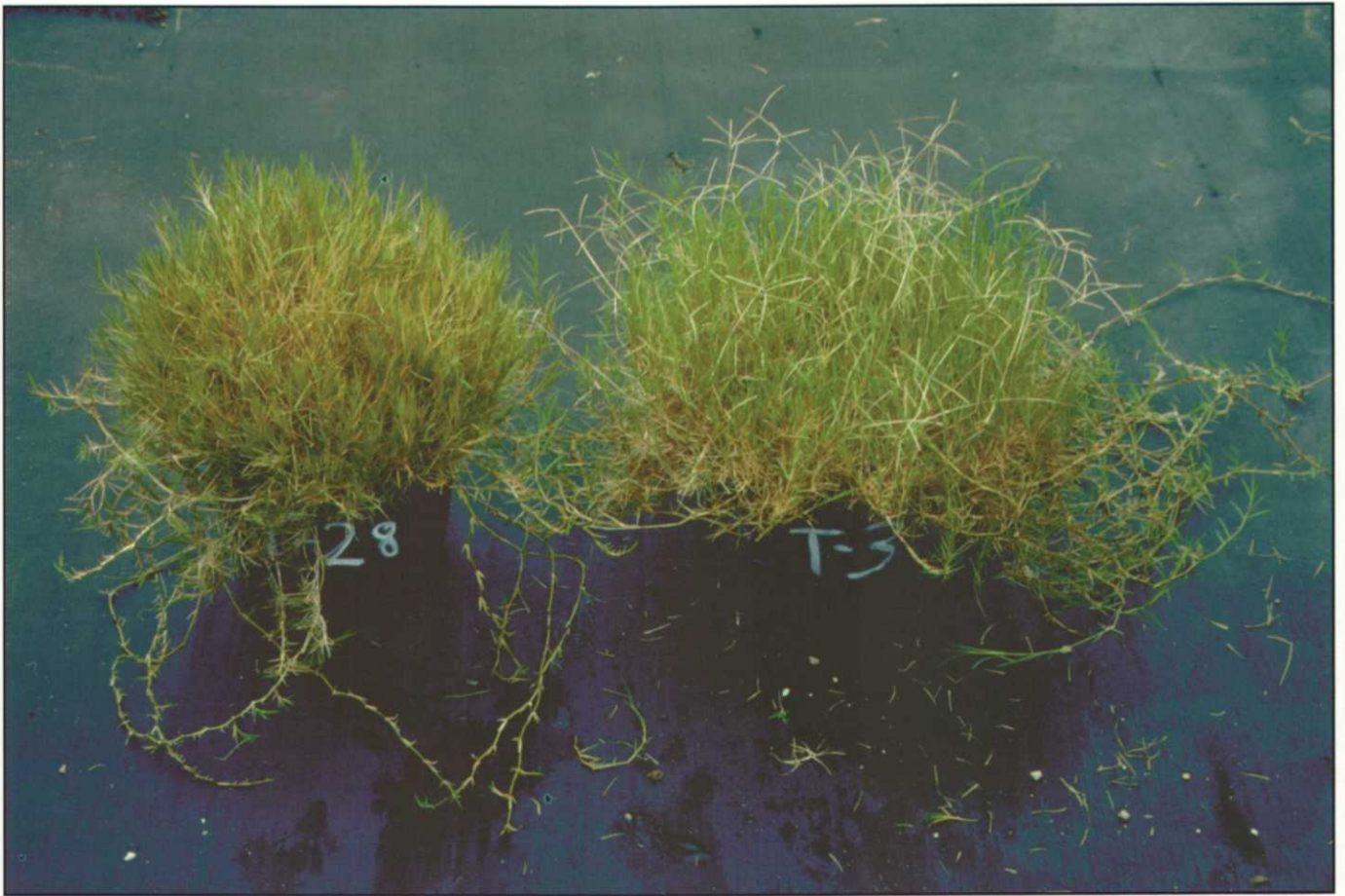
Golf course professionals have long been confronted with the problem of off-types in greens and fairways

DNA

BY PHIL BUSEY, CHARLIE GUY, AL DUDECK
AND NIGEL HARRISON

There is a world with perfect lawns in H.G. Wells' *Time Machine*. Time Traveler found the future "air was free of gnats, the earth from weeds or fungi; everywhere were fruits and sweet and delightful flowers..." Predicting advances from technology, Wells pointed out that in the early 1900s nature was "...shy and slow in our clumsy hands. Some day all this will be better organized."

Wells' imaginary future was not altogether desirable. But for better or worse, unprecedented biological change is already here. This article answers basic questions about DNA technology, focusing on DNA in bermudagrass fingerprinting. We'll show that DNA fingerprinting can provide quality assurance, by supporting the certification of Florida bermudagrass planting stock. First let's look at the problem of off-type bermudagrasses.



Dark green off-type (T-3) grown in a container differed morphologically from Georgia foundation Tifway' (T-28), which was yellowish green. T-3 also had abundant inflorescences and pollen, while 'Tifway' did not. Matrix grass (T-1) could not be distinguished morphologically from 'Tifway'.

Bermudagrass Fingerprinting

The problem: off-type bermudagrasses

Golf course professionals have long been confronted with the problem of off-types in greens and fairways. Off-types are genetic variants, generally of unknown origin. In a 1975 article, "What is happening to our bermudagrass?" Monty Moncrief recognized the occurrence of off-types. The complaint 20 years ago was that hybrid bermudagrass greens (i.e., Tifdwarf and Tifgreen) were showing patches with different characteristics. Ever since, a growing demand for faster greens, higher number of rounds and better year-round color have made these irregularities more conspicuous. Excessively close mowing may have further exposed genetic variants that would not be obvious at a higher cut. Rising expectations are as much behind the problem as the fact that we are growing grasses developed 35 years ago (i.e., Tifdwarf, Tifgreen and Tifway) that were never meant to be stressed in the way they are today.

Is this really a problem? Yes, it is a serious problem. Tifway and Tifdwarf

Rising
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grasses
developed 35
years ago

DNA fingerprinting is any method for identification or comparison based directly on an organism's DNA

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are still the most serviceable grasses for Florida golf courses. When planted successfully in pure stands, these grasses are responsive to maintenance and play. If the thousands of dollars spent on golf course operations are applied to pure Tifway and Tifdwarf, then consistently high density and wear tolerance, uniform color and predictable ball roll result. In contrast, the presence of genetic mixtures results in excess maintenance costs, disappointed expectations of golfers and serious challenges to the credibility of golf course superintendents. If you are growing the wrong grass, there's no telling how much money you might throw at it and still not have a golf course on par with the one down the street.

Where do off-types come from?

Amazingly, we don't know where off-types come from. It is reasonable to presume that some off-types originate from contaminated sprig stock used to plant golf courses. Other off-types may be spontaneous mutations. They and seedling of *common bermudagrass* might also be redistributed on golfers' shoes, golf cart tires and mower parts. Nevertheless, and despite much speculation (Table 1), we

still do not know where the off-types come from, how they may be prevented or if they can be prevented. DNA fingerprinting offers us the potential to understand the problem and solve it.

What is DNA fingerprinting?

DNA fingerprinting is any method for identification or comparison based directly on an organism's DNA (*See related story, "What is DNA?," Page 64*) Later we will discuss different DNA fingerprinting approaches, such as RFLPs and PCR profiling. The purpose of any technique is to tell whether a grass source is what it is claimed.

How can DNA fingerprinting help?

Golf course facing reconstruction, replanting and new construction have quandaries such as, "How do we know we are getting clean planting stock?" and "How do we know we're going to remain clean over the next five years?" DNA fingerprinting is offered as a key to understanding the problem, and it may provide a solution. This is because DNA fingerprinting can be used as a quality control step in the production and distri-

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The advantage of DNA testing over other methods is its capability of being faster and more accurate

bution of planting stock. It makes sense that this be done on a statewide basis before the grass ever hits the market as a part of certification. Otherwise, each superintendent and greens committee is left to do it piecemeal.

If DNA testing can show a prospective planting stock to be authentic, then this is extra assurance that it will perform predictably. (In practice, one would use DNA fingerprinting to reject rather than accept planting stock.) DNA fingerprinting is appropriate because it has great power to distinguish genetic off-types. DNA fingerprinting is so powerful that it gives scientists a way to quantify degrees

of relationship. This is helpful in determining whether off-types are mutations or seedling variants. The advantage of DNA testing over other methods is its capability of being faster and more accurate than other methods. As we will explain later, however, a sound program needs to be three-pronged, considering chromosomes, morphology and DNA.

Despite the capabilities of new technology, nobody should promote DNA fingerprinting as a cure-all. Even in this new age, Monty's excellent practical recommendation, "constant surveillance is necessary," is good advice.

Is DNA fingerprinting a specific method?

No. There are two general approaches, RFLPs and PCR profiling. RFLPs (restriction fragment length polymorphisms) analysis is more precise, but usually more expensive. They work directly with specific regions of an organism's DNA. In contrast, PCR approaches usually amplify random regions of the DNA, using the Polymerase Chain Reaction (PCR). This lab procedure copies minute traces of DNA to produce 2, 4, 8, 16, 32, 64, 128 and eventually millions of copies. So much DNA is made that it is readily visible in the presence of fluorescent stain.

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Stoloniferous off-type (T-75) surrounded by matrix grass (T-74) on a Florida green. Both T-74 and T-75 differed in DNA profile from Georgia foundation 'Tifdwarf' and from one another.

Often, to detect the small amount of DNA, the visualization process uses radioactive isotopes

Both RFLPs and PCR profiling methods produce banding patterns, much like the bar codes used at the supermarket check-out. Characteristic differences in banding patterns tell two grasses apart.

How does DNA fingerprinting work?

Both RFLPs and PCR approaches are founded on recognition sequences contained in the organism's DNA. (See related story, "What is DNA?" Page 64) A recognition sequence is a region of DNA with a particular sequence of nucleotides, much like a signature or a pass code. Whereas RFLPs use both enzymes and complementary DNA sequences to do the recognizing, PCR methods use only the complementary property of DNA itself to do the recognizing.

For RFLPs, each enzyme used recognizes only a particular DNA sequence, and then cuts the DNA fragment at that point. For PCR, recognition occurs during the amplification, or copying, of DNA, in which specific primers are used to start the process of copying DNA. Primers

bind specifically with "complementary" sequences. Each method produces characteristic fragments of consistent length, using recognition sequences at each end of the fragment. The recognition sequences are sometimes portrayed as "bookends."

Is one method of DNA fingerprinting best?

No. The usefulness of a particular DNA fingerprinting method is based on its cost, reproducibility and power to discriminate. RFLPs involve a hybridization process that is laborious and requires a high level of technical skill. Often, to detect the small amount of DNA, the visualization process uses radioactive isotopes that require safety containment. In contrast, PCR is rapid, requires a lower level of technical skill and does not require the use of radioisotopes.

Recipe improvements in PCR profiling are constantly being made, and their use depends on the situation. The first two documented methods were RAPD (random amplified polymorphic DNA)



Repeating occurrence of bermudagrass genetic off-types on a Florida green reduced the putting quality.



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An important safeguard is blind testing, where the scientists do not know the true identities of the material being evaluated

Scientists are still making improvements to this new approach of DNA fingerprinting.

and AP-PCR (arbitrarily primed PCR), both from 1990; another method, DAF (DNA amplification fingerprinting), was introduced in 1991. The main characteristics distinguishing the methods are the length of the primer, the primer concentration, the choice of gel and method of staining for displaying banding patterns. Some methods borrow aspects from other methods.

Scientists are still making improvements to this new approach of DNA fingerprinting. Presently there is no universal standard for PCR profiling. Typically, a particular laboratory uses only one method. Consequently, there are few objective comparisons among methods. The goal of choosing a method is to produce powerful, repeatable results from the same plant materials. So, in adopting a PCR profiling method, it must be shown to work in different laboratories. Internationally, most scientists use an adaptation of RAPDs. During 1994 and 1995, according to a major literature citation service, there were over 350 publications citing the use of RAPDs.

Are there pitfalls?

Yes, several. A comparison is only as good as the sample, and only as good as the standard with which it is compared. If only one sprig was sampled, it might check out to be the expected grass, but the entire remainder of the field could be a contaminant. To be 100% sure, each of the million of sprigs in the field would have to be DNA fingerprinted. If one wanted even 95% certainty that the sprig field source was 95% pure, it would require 59 DNA fingerprints, cumulatively costing about \$20,000 at current prices.

Costs could be reduced by various means. Sample pooling might help sometimes, but excessive pooling would reduce the sensitivity of the test, creating confusion. A thorough look at the genetic makeup of a field of grass is costly beyond imagination, so DNA fingerprinting must be used judiciously. Morphological markers and chromosome counts are less costly, and are therefore the front lines for off-type detection. The hybrid bermudagrasses are all supposed to have 27 chromosomes, while common bermudagrasses (in-

cluding most seedling variants) have 36 chromosomes.

What safeguards are needed?

An important safeguard is blind testing where the scientists do not know the true identities of the material being evaluated. No procedure is 100% reliable, either because of inconsistent chemical reactions, human error or unexplained sources of variation. Another safeguard, mentioned previously, is to effectively repeat a procedure in different laboratories, and get the same results.

Standards are another sensitive issue, because it must be shown that the source standard (either breeder's or foundation stock) is itself consistent. Besides, the same standard should be used every year. There is currently no single national repository for maintaining the source material of released cultivars. At the University of Florida we are carefully maintaining source materials, which we have propagated from a single sprig.

How might DNA fingerprinting provide a research solution?

The first step is to document, through scientific publication, that a problem exists. This has never been done!

Next, DNA fingerprinting, in combination with morphology and chromosomes, should be used to discover the variation among bermudagrass off-types. By systematic procedures, we can test alternate hypotheses for their origin (Table 1). If we judge that off-types occur commonly as spontaneous mutations, then golf course superintendents and greens committees will be so informed.

If recurring mutations are the source of the problem, then they may not be preventable. This is probably not so, however, because there exist 30-year-old greens showing no evidence of off-types.

How might DNA fingerprinting provide a solution for the golf course?

DNA fingerprinting should be considered first as a tool for certification of source material, secondly for the validation of a grower's field and as

DNA fingerprinting can be a helpful tool in certification

a last resort for the golf course. While there is legal rationale for DNA fingerprinting a golf course, this will not correct the source of the problem. Without certification and other quality control efforts, the issue of off-types will continue to be debated and unresolved. The solution is for turfgrass certification inspectors to use chromosome counts, morphology and DNA testing as a routine quality control step, before grass is put on the market.

What can we do meanwhile, before research is completed?

Four things: references, accountability, personal inspection and performance. (1) Request a list of 1-3 year-old plantings from prospective grassing contractors. (2) Request written documentation on where the source grass originated. (3) Personally inspect prospective source fields, hopefully having the opportunity to look at areas where the grass has been mown closely over sev-

eral months. (4) Include appropriate performance specifications in the bid with timelines for inspection of quality and consistency and an appropriate remedy (hence, a performance bond.)

Conclusions

DNA fingerprinting can be a helpful tool in certification, if the technology is powerful and repeatable for bermudagrass off-types. DNA fingerprinting would help ensure the consistency of source plant material and sprig stock, and it can be used with chromosome counts and simple morphology.

It is important to show that the technique really works on bermudagrass off-types, and to document the presence and nature of off-types. This has never been done. We believe it will work. We also believe that it will give us a treasure of practical information on how to maintain the purity of improved bermudagrass.

While there is legal rationale for DNA fingerprinting a golf course, this will not correct the source of the problem

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Table 1.

Examples of hypothetical origin and genetic nature for off-type bermudagrasses. There is not a single instance in which any of these hypotheses has been either proved or disproved. Some suggested explanations are more probable than others.

ORIGIN	GENETIC NATURE		
	MUTATIONS	SEEDLINGS	CONTAMINATION
History of Planting Source;	Spontaneous mutation occurred once in breeder's plots, 35 years ago, and no effort was subsequently made to repropagate from a single sprig;	Bermudagrass seeds blew in from a pasture to the certified sprig field and seedlings were unknowingly propagated;	Sprig grower allowed runners of different cultivars to creep across ditches separating adjacent fields; fields were mown high, and this variation went undetected
Golf Course Construction	Dozer operations caused mechanical stress on underground bermudagrass rhizomes, causing them to mutate into new genetic variations	A little bird flew over the golf course one day, dropping a seed. A few weeks later, the seed germinated, forming a plant which eventually took over the golf course	Fumigant was unable to penetrate deeply enough to kill dormant rhizomes of 'Common,' because a high organic content tied up MeBr near the surface
Planting and Grow-in	An herbicide was used which is known to be a mitotic arrester, thus potentially mutagenic; a combination of chromosome breakages and endopolyploid cells resulted in new genetic variations	'Common' bermudagrass seeds were tracked in from adjacent rough; because soil was primarily bare, these had an opportunity to germinate and become established	Planting crew used the same truck to haul 'Tifdwarf' and 'Tifway' sprigs, without cleaning between loads. 'Tifway' was inadvertently carried over in the lot of 'Tifdwarf.'
Golf Course Operations	Greens were exposed to UV light, which caused turf cells to mutate spontaneously	In a one-in-a-million occurrence, 'Tifway' produced an unreduced gamete, which was fertilized by pollen from 'Common' bermudagrass growing along an adjacent highway	Golfers, golf car tires or mower parts carried seeds or sprigs from rough; cup cutter inadvertently redistributed contaminants

What is DNA?

DNA is the blueprint for all life forms, from animals to plants. As a script tells the actor or actress what part to play, DNA tells the organism what it will be: animal, plant, microbe. DNA differences between two organisms can be small or

large. This explains how siblings can be similar, yet not the same. DNA differences also explain how a virus can produce another virus, and an elephant can produce another elephant. ➤

So DNA is genes?

No, not entirely. Most DNA in plants and animals has no essential purpose in the organism. Most DNA is either repetitive script, or a series of scrambled messages that are no long part of the required genetic script. Sometimes this extra DNA is called *junk DNA*.

How is DNA organized in the cell?

DNA is a linear text, packaged into chromosomes. Because the DNA molecule is a double helix, there are two strands. One strand is the *code*, which tells the cell what to do, and makes you you. The other strand is a *complementary image*. Both strands are copied to produce two new double-stranded molecules. The copying of DNA is an exact process, due to the exact manner by which two strands bind to one another. This exactness is called *complementarity*, and it results because subunits bind only with certain other subunits.

How does the cell read and write the DNA text?

As with any language, there are subunits. The basic subunit for talking the language of DNA is the nucleotide. Although DNA has only four kinds of nucleotides, they can be arranged in a multitude of combinations. A few thousand nucleotides are enough to blueprint an important kind of chemical in the cell, a protein. Different kinds of proteins serve as enzyme catalysts and provide other vital functions in the cell. Since human DNA is composed of a sequence of three billion nucleotides, our DNA text easily blueprints the tens of thousands of enzymes needed to create each of us.

How does knowing the genetic code help identify grasses?

It doesn't. For identifying grasses, the actual function of DNA is pretty much irrelevant. We treat DNA as if it were just like a fingerprint, something for which it doesn't matter if there is a purpose. Some DNA fingerprinting procedures use DNA that is known not to be part of a gene. Why? Because there are lots of those sequences, their degree of repetition can be characteristic of a particular individual, and these sequences show more natural variation than is normally found in essential genes.

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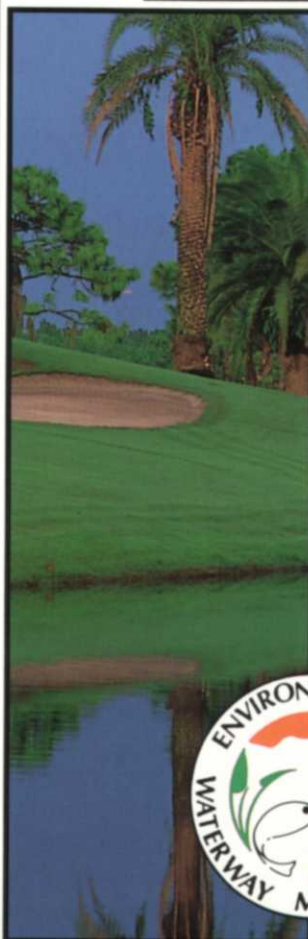


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Where Has Our Loyalty Gone?

In my opinion, 90% of all superintendents are underpaid for what is expected of them

I just finished reading the commentary entitled “Management Groups” written by Greg Plotner. I agree with some of what Greg says in the article. There are some situations where an honorable management group is good and can help struggling clubs. I also agree that there are several fly-by-night management groups that are ruining clubs and our industry for personal financial gains, but that’s a whole other topic. However, there is one comment Greg makes that disturbs me tremendously.

Greg comments that if you work for a management group, you will be asked to operate on a tight budget and do more for less. That part is admirable! Most good superintendents are masters at getting the most from their dollars, no matter what the budget is. Budget cuts are a way of life for most superintendents, and a good superintendent will endure. What angers me is where Greg says you will possibly be expected to work for a wage less than what you consider fair. BS!!

Attitudes like that are tearing apart the foundation and hard work established by all who preceded us in building the credibility of our profession.

The standards of our excellence grows in leaps and bounds every year. Therefore our compensation should also grow. In my opinion, 90% of all superintendents are underpaid for what is expected of them. Working for less than what is considered

fair is starting to and will continue to cheapen our profession. PGA professionals surely don’t undersell themselves — why should we? Certain standards should be set and no member of any superintendents association should settle for less than those standards.

I know what a lot of management group superintendents make. All those supers I know are making about \$20,000 a year less than they should. I find it hard to believe that a management group couldn’t come up with \$20,000 extra a year for the most important person in a golf course operation.

Most of the clubs run by management groups are high-volume clubs. If a club plays 40,000 rounds of golf a year, increasing the greens fee or cart fee 50 cents per round will compensate the superintendent. That is only one way to raise sufficient funds — there are many more.

In my opinion, our loyalties should lie within ourselves and our profession, not with management groups who want a lot for a little.

By selling yourself short you are hurting yourself, all who follow you, and you are ripping apart all the hard work of those who fought for years to improve our image. The demands on superintendents increase yearly. It’s time for all superintendents to take a stand and demand more compensation.

— Mark Hamilton, CGCS

‘Our loyalties should lie within ourselves and our profession, not with management groups who want a lot for a little’

Greg's response: Supers aren't clones

Dear Mike,

There are several points that you make reference to that I would like to comment on.

First of all, the statement which I made about working for a wage that is less than what that person might consider fair, is the same statement you make about supers making \$20,000 a year less than they should.

Most superintendents are indeed, as you said, *underpaid*. That is what my statement is saying but in a different context. If it says anything different, I didn't intend for it to.

Another point you bring up is that loyalties should lie within ourselves and

'From what I've seen over the years, being outspoken about wages doesn't usually get one anywhere other than terminated from employment'

our profession, which I totally agree with. You continue by making the comment, "Don't sell yourself short."

This is also true, but what does one do when in a position of working for a wage less than he or she considers fair? Does that person abandon ship and go to the unemployment office?

Most supers I know will continue with that job until a new one arises or changes within that job are made. From what I've seen over the years, being outspoken about wages doesn't usually get one anywhere other than terminated from employment.

A third point you make states that certain standards should be set (which I assume have to do with wages), and that no superintendent should settle for less than those standards. Bravo! Some might agree, but I don't! Just as all jobs have different salary demands, so do most superintendents. It's the American way!

There are many reasons why salary

structures are so different and many reasons why all job descriptions are so different. Supers aren't clones, and I think it's great that each of us has our own unique methods of bringing about positive results within our own operations.

Those methods determine one's place of employment and salary. If it happens

to be employment at a management owned and/or operated facility, then it may be at a wage that is comparable to other clubs within its web. Or, it may be at a wage less than what that person considers fair, then who's responsibility is it to change it? End of story!

— Greg Plotner, CGCS

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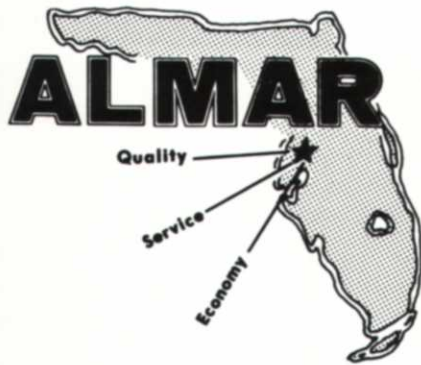
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Superintendent's Top Ten Causes of Stress

BY TOM HILFERTY, SUNCOAST GCSA

- (10) Owner wants you to hire nephew, who is going to school to become a superintendent.
- (9) Spray tech thinks calibration works best by trial and error.
- (8) Mechanic believes three different cutting heights is the best way to get that striped look.
- (7) Greens chairman enters you in big weed growing contest.
- (6) Weekend crew turns out to be you!
- (5) Your only friends are salespeople.
- (4) "Top Man" mows 45 acres of rough with mower in backlap.
- (3) High kryptonite levels in soil samples have you feeling run down.
(Sorry! That's Superman Stresses!)
- (2) Most of your membership are big Paul Harvey fans.
- (1) Last entry in missing spray tech's log is "Round-up greens. ha-ha-ha."

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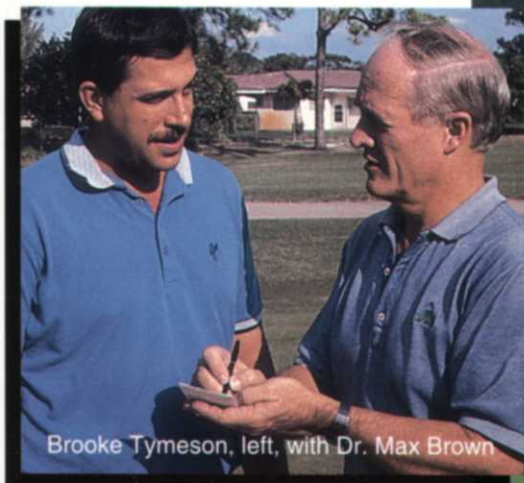


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Brooke Tymeson, left, with Dr. Max Brown

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Fairness —

From the WGCSA *Grass Roots*

BY MIKE SEMLER

There are occasions when I get a sense of being completely helpless. This feeling always seems to come in the middle of the summer during hot and dry spells. It starts with one small occurrence and then steamrolls in an entire series of events that finally culminate in one major ordeal.

The latest ordeal started about two weeks ago when a normally reliable pin setter decided to break the monotony by setting the pin in number 18 green on the top of a mound. The pin placement was clearly an unfair setting for the golfers. But this fine young person decided to put it there anyway.

You can imagine the uproar that followed because of the principles which were broken that morning. My guidelines on pin placement dictate that all locations should be fair for the golfer. This one clearly was not!

A few mornings later, in a matter of minutes after leaving the building, all of the equipment was back in the maintenance facility for needed repairs. Normally, we would have dealt with this in a cool, calm manner. However, this morning was our first shotgun start, and speed was of the essence.

“Unbelievable,” I thought, “how every piece can leave in perfect working order, and return in such a short time for needed repairs.” I must have walked under a stepladder that morning.

The final straw came a few days later on a rainy morning, when I decided it was time to clean out some old files.

Included in this assortment were some past newspaper and magazine articles that I kept because something in them caught my attention and I figured I could use them later. Two of these articles pertained to two new courses that were on the verge of opening to play for the first time. Included in the articles were lengthy comments about the staff additions made to the clubs, namely the golf professional and the clubhouse manager.

The articles gave very pleasant histories of these gentlemen and the positions they had previously held. Overall, they were very well-written articles. Except for one thing. The authors forgot to mention one very key element in these golf course operations — the golf course superintendent! Shame on the authors for forgetting one of the most important people at any golf club.

The two superintendents at these two clubs had every right to be angry because, once again, they were left out of the limelight. Their names did not appear in print, and they received absolutely no recognition for the hard work they had done in the establishment of these golf courses. Most of that work had been completed before the golf pro or clubhouse

The authors forgot to mention one very key element in these golf course operations — the golf course superintendent!

Without the golf course superintendent, most golf clubs would not exist nor survive as they do now

manager were even hired. Nor did the superintendents receive any respect for the future value they would give to their respective memberships.

Those two superintendents were not the only losers when these articles appeared in print. Every golf course superintendent, everywhere, lost a little bit of identity that day. In addition, all the readers who read those articles were losers also. They weren't given the whole story.

The readers were being misled because the assumption in the articles was that the wonderful golf course the golfers were enjoying was there because of some faceless and nameless identity. What a shame the readers did not get to know those two superintendents. They deserved better

than that, and so did the superintendents.

Readers were being misinformed because one very key element in the management of those two clubs was left out. Without the golf course superintendent, most golf clubs would not exist nor survive as they do now. Not many positions in the golf club can say that!

I wish I could go back to that day when the pin location was misplaced on the 18th green and start all over. Maybe things would have turned out differently. My rule to employees on pin placement is to be fair. My rules on recognition and mutual respect are also to be fair. Unfortunately, not everyone plays by my set of rules, and on this morning, I did not feel golf course superintendents were treated fairly.

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1995 Florida Green Photo Contest

Only eight photographers answered the call for submissions to the 1995 Florida Green Photo Contest. Congratulations to the winners. Look for the 1996 Photo Contest guidelines in the next issue. There will some changes based on what we learned from this year's contest. Many thanks to the panel of judges from the Central Florida GCSA Board of Directors: J. Kevin Rotti, Joe Ondo, Brian Jenkins and John Kopack.



Best Overall

Wildlife on the Course. Laurel Oak Country Club by E.E. "Mack" Baugh, CGCS.



Category 1
*Wildlife
on the
Course*

1st Place (above) - Bald Eagle
by Walter Owsiany, CGCS.
Audubon Country Club

2nd Place (right) - Amber
Winged Skimmers by Gary
Grigg, CGCS. Naples
National G.C.



Category 2a
*Course
Landscaping
Formal Beds*

1st Place (right) - Grey Oaks Country
Club
by Mike Hamilton, CGCS.

2nd Place (next page) -
The Sanctuary Golf Club
by David Wood.





Category 2a
2nd Place (left) -
The Sanctuary Golf Club
by David Wood

Category 2b
*Course
Landscaping
Use of
Native
Plants*



2b. 1st Place (above) -
Grey Oaks Country Club
by Mike Hamilton, CGCS

2b. 2nd Place (left) -
Grey Oaks Country Club
by Mike Hamilton, CGCS





Category 3
*Scenic
Hole
Layout*

1st Place (above) - 9th hole Palm Beach County Club
by Paul Szlasa

2nd Place (right) - Grey Oaks Country Club
by Mike Hamilton, CGCS



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The Summer of '95

Mark My Words



Mark Jarrell

Mark Jarrell, CGCS
Assistant Editor

It is mid-September as I sit down to write this, and already we have received more than 57 inches of rain for the year, which is normally about the total for a full year in my area.

August was especially brutal with almost 20 inches. Though we may not reach last year's total of 90 inches, I can't remember any previous summers where I had to repair the same washouts on new construction so many times.

Couple this with the worst mole cricket infestation I've ever seen and 1995 takes over as one of my worst years in the golf business.

The difficulties presented by Mother Nature are frustrating and often disheartening but I can count myself among the few fortunate superintendents who don't get ulcers worrying about job security due to weather-related problems.

Some of my peers are not so lucky. I fully expect to begin hearing of superintendents fired for "unacceptable playing conditions" about the time this magazine reaches your hands.

One of our area's most prominent superintendents was told by a greens chairman over a year ago that "they paid him enough to handle any weather-related problem."

Another in Naples told me in march that some members absolutely refused to believe that two days of frost could cause the turf to go off-color, simply because frost hadn't occurred in that area for several years and they had never seen it.

Saving your job often depends upon your people skills — diplomacy, poise and tact — over your agronomic skills when trying to deal with Mother Nature. Giving thorough and factual information in a non-confrontational manner is your best bet when explaining to a frustrated member about the imperfect playing conditions.

In the hope that I might present some information that could help save a superintendent's job because he didn't give a thorough enough answer or left out a significant point, may I offer the following points when explaining the detrimental effects of excessive rainfall:

When feeling the pressure to open the course during wet conditions, and especially about allowing cart traffic, explain that waterlogged soils will not support the weight of maintenance equipment or golf carts. Water acts as a lubricant between the mineral soil particles, and traffic will break down the soil structure.

The resulting compaction and turf damage from rutting may take weeks to correct. The excess water replaces the air in the soil's pore spaces, depleting soil oxygen and slowing the respiratory processes.

Root growth is restricted, and toxic organic acids and gases may form. Extra aerifications, which we all hate, may be necessary to release these gases, stimulate root growth, put oxygen into the root zone and restore soil structure, so carefully consider the consequences of traffic on a wet golf course.

In addition, turfgrasses will *luxury consume* excess water and nutrients, causing cell walls to become elongated and weak. The softer tissue breaks apart more easily under traffic, making the grass plant more vulnerable to attack from the many parasitic fungi that thrive under the wet conditions.

Thinking only of the lost income from keeping the course closed may be false economy; the extra money that may be needed for fungicides and aerification may be greater than the additional revenue.

As any good superintendent knows, raising the mowing height on greens during stressful conditions, such as those created during heavy and frequent rains, gives the turf a better chance of surviving

'After 26 years in the golf business, I have to chuckle at those romantic environmentalists who view Mother Nature as perfect and benign'

the adverse conditions, but the typical member doesn't know this, so save yourself some grief by educating them to the facts.

Be prepared to explain your need for budget revisions because of the fertilizer and pesticides that are washed away during excessive rains.

Finally, I'd like to say a word about Primo. Typically, all of us who write for your FGCSA publications avoid sounding commercial, but it fits into the subject of my article, and I would be remiss in not pointing out how useful it is during Florida's rainy season. At Palm Beach National I have a mix of bermudagrasses in my fairways and was worried about the effects of Primo before I started using it

in 1993.

I'm happy to say that the use of Primo at 14 ounces per acre, every six weeks or so, actually tightens the grasses up and makes them appear more consistent. Cell walls are stronger and better resist fungal invasion. These are the side benefits.

The real value of Primo is in the fact that I have sometimes gone ten days between mowing of fairways due to persistent wet conditions and, when we were able to mow, we weren't "bailing hay" as we would have been in previous years prior to using Primo.

I know some superintendents haven't yet tried it — probably due to its high cost — but be sure you factor in the importance of increased quality and playability

in your cost-to-benefit evaluation.

As frustrating as bad weather is, I know most superintendents don't mind having to face Mother Nature's challenges. It just seems unfair that we also have to fear for our jobs when she kicks us in the teeth.

After 26 years in the golf business, I have to chuckle at those romantic environmentalists who view Mother Nature as perfect and benign.

Don't these people ever watch public television? They obviously don't have jobs in natural resource management. Life is a constant struggle and Mother Nature can be your best friend or your worst enemy.

Good luck to us all!



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"Servicing South Florida"

Let's talk golf

Green Side Up



Joel D. Jackson

Joel D. Jackson, CGCS
Editor

We keep saying we're tired of preaching to the choir. Let's take the plunge and reach out to that mass of viewers that tune in to the plethora of talk shows on television. They crave the dysfunctional! Let's give them the sordid story of bermudagrass "off types!"

Their morbid curiosity unsated, we can show slides of nematodes feeding on mole cricket cadavers. For something really disgusting, we could show a slow-motion video of my golf swing. It might go something like this:

Fade In: Camera pans audience assembled in corporate hospitality tent left over from the Classic Invitational Open. Sound track from the movie Caddy Shack is playing.

Announcer's voice: And now ladies and gentlemen it's time for Let's Talk Golf with your host, that lady of the links, a scrappy thirty-six handicapper who has never conceded a putt, Miss Okra Windtree!

Okra enters tent from right. Wearing a Fuschia, Optic Yellow, Chartreuse, and International Orange golf outfit from Ultimate Insult of Redondo Beach. Camera pans wildly cheering audience. Okra bows. Waves. Blows kisses.

Okra: Thank you. Thank you very much. Thank you. Ya'll are great! Thank you. OK! OK! Enough already! We've got a great show today and I want to introduce our panel of guests right now. We are very fortunate to have three golf course superintendents from the area here today. They are going to give us the down and dirty of golf course maintenance.

On my left is Brad Blazer, CGCS, from the Wine Cellars Country Club. In the middle is Gene Denim of the city course, Divot Acres Golf Club, and on the far right is Dave Docker, CGCS. Dave is the Director of Golf Maintenance for the Rest and Relax Resort chain. Gentleman, welcome! We look forward to visiting with you today. For the benefit of the three hundred people jammed in this 20 by 20 tent, I'd like each of you to tell us a little bit about your course and how you

manage turf. Brad, would you please start?

Brad: I'd love to Okra. Wine Cellars Country Club is a private club with just 300 members from all over the world. Mostly bankers, lawyers, doctors, celebrities, and tycoons. We have 151 male members and 149 female members. Mr. Elliott Sureshank is our 47th Green Committee Chairman this year. Our diversity programs have been sanctioned by the NCAA, NOW, Hard Copy and Geraldo Rivera.

We have 12 teeing areas on each hole to allow for people of varying abilities to enjoy each hole. The most forward tees are affectionately called, The Putting Course.

I facilitate a crew of 54 people for 18 holes. This does not include our two assistant superintendents, two pest control technicians, two Irrigation technicians, four mechanics, one lawyer and my administrative assistant, Zelda.

We contract out the maintenance for the clubhouse grounds, tennis courts, pool area and roadways in order to save money. We hand mow greens, tees, collars, approaches, and fairways. We mow the roughs with triplexes. We hand rake all of the bunkers and hand trim all of the runners. We are closed from June 1st to October 1st and every Monday the rest of the year. Our first tee time is 9 a.m. and shotgun starts are not permitted.

We have closed circuit television on every hole to monitor golf etiquette. Any players not filling divots or fixing ball marks have their playing privileges suspended for 30 days. We also have the satellite tracking and communication system on our golf carts and maintenance equipment.

I can monitor where everyone is instantly. We can also tell if a cart is violating "Cart Paths Only" and "90 Degree Rule restrictions." Violators have been successfully prosecuted in small claims court and video tapes of the incidents have been shown on the TV show, "Cops." It wasn't pretty!

Okra: Since we always speak frankly on this show Brad, I can tell you I didn't appreciate the Geraldo comment. Next,

from Divot Acres, Gene Denim.

Gene: Hello Okra, it's nice to be here. I'm afraid my operation isn't quite as exotic and high tech as Brad's. In the first place, my membership is anybody with the ten bucks green fee in their pocket. There are six of us on the course, not counting the community service folks that Judge Gavel sends over from the courthouse. They aren't much help because we have to go pick them up and bring them to work. Suspended licenses. Things like that. Once we had a serial killer that was mistakenly put in a work release program. Didn't know it at the time. Maybe that's why I didn't see any armadillos that summer.

I am the mechanic, pest control operator and irrigation man. The only thing we hand mow is the mayor's yard. Oops, I guess I shouldn't say that should I? We're never closed. We just yell "fore" and run that aerifier across the green. We all wear hard hats and flack jackets anyhow. Shoot, last year we had three old coots out there playing in Hurricane Hepsibah! At the last city council meeting they were talking about installing floodlights on all the holes so we could stay open 24 hours. When I mentioned something about irrigating at night, Councilman Pinchpenny suggested we just yell "fore" and turn it on! He was peeved because we ruined his brand new Titleist X-out ball with our aerifier last week. The Council is also considering leasing the driving range for the annual Tri-county Tractor Pull. Needless to say they keep us pretty busy.

Our budget is \$50,000 per year which covers all the salaries, materials and equipment. If it wasn't for the adopt-a-hole program by the local Neighborhood Watch Committee we couldn't mow down those hiding places in the roughs that used to attract an occasional mugger. On top of all that, local radio personality, Saul Garvey, is suing to have all golf courses banned in the city limits. Something to do with wanting to take a walk in a sterile environment and his cashmere sweater being ruined by bird poop. He claims that golf courses are nuisances



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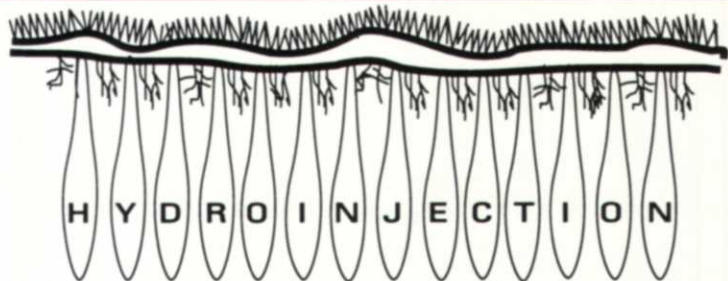
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that attract wildlife. I think Saul has been sitting too close to the transmitter for too long if you know what I mean!

Okra: Wow! Gene your plate sure is full! On this program we also like to interfere in people's lives and dispense unfounded advice. So Gene, believe me when I say you'd better update that resume. I understand Mack Willis of the 30 Minutes Show is headed over the the Mayor's house right now to film his yard. And last but not least, Dave Docker. Hi Dave!

Dave: Hi yourself, Okra. Thanks for asking me to be on the show. In this totally open atmosphere that has been created by some of the audience cutting out the sides of the tent, I want to make a confession. As you see me today, and believe me I have noticed the stares, I stand 3 feet 9 inches tall. I was 5 feet 10 inches before our Golf Division was downsized. I consider my self very lucky compared to poor old Sherm over in Marketing, which experienced downsizing and FLATTENING!

As for golf course management, I travel the world coordinating and consulting the various courses we operate as part of our resorts. To be more effective, I have learned to speak French, Spanish, Russian, German, Japanese, Chinese, Portuguese, Swahili, Farsi, Yiddish and Bronx. One of my responsibilities is to coordinate corporate purchases of equipment and make sure all the safety decals are translated properly and put on the machines going to the different countries. One year we had some Swahili labels on the equipment going to Brazil. We are still mitigating that part of the rain forest.

To be more effective, I have learned to speak French, Spanish, Russian, German, Japanese, Chinese, Portuguese, Swahili, Farsi, Yiddish and Bronx.

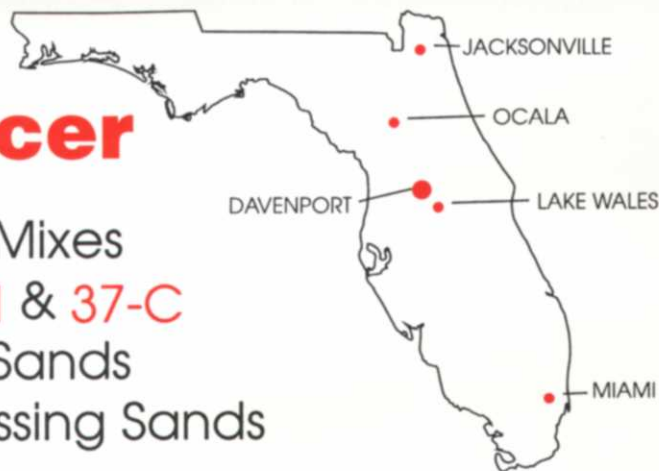
Unlike Brad and Dave, I do not engage in the mundane matters of turf management on a daily basis. I do act as a consultant when visiting our resorts and have learned many unique skills such as Gazelle Stampede Damage Recovery Methods; Bavarian Botulism Prevention On Tall Fescues; The Shortcomings of Rice Paddies As Temporary Greens. The list goes on.

Okra: Dave, I hate to cut you off, but our time is almost gone. Folks, how about a great big hand for our three superintendents. Gentlemen, thank you for sharing your insights and comments on golf maintenance with us today. Tomorrow on Let's Talk Golf we go into the Pro Shop to talk to teaching professionals to learn about the latest medical tragedy, "Paralysis by Analysis." Don't miss it. Bye now.

Editor's Disclaimer: This column should be read only by trained professionals. If you didn't laugh or smile, I failed. If you're still laughing, seek help immediately! Come to think of it. This column should be **written** only by trained professionals!

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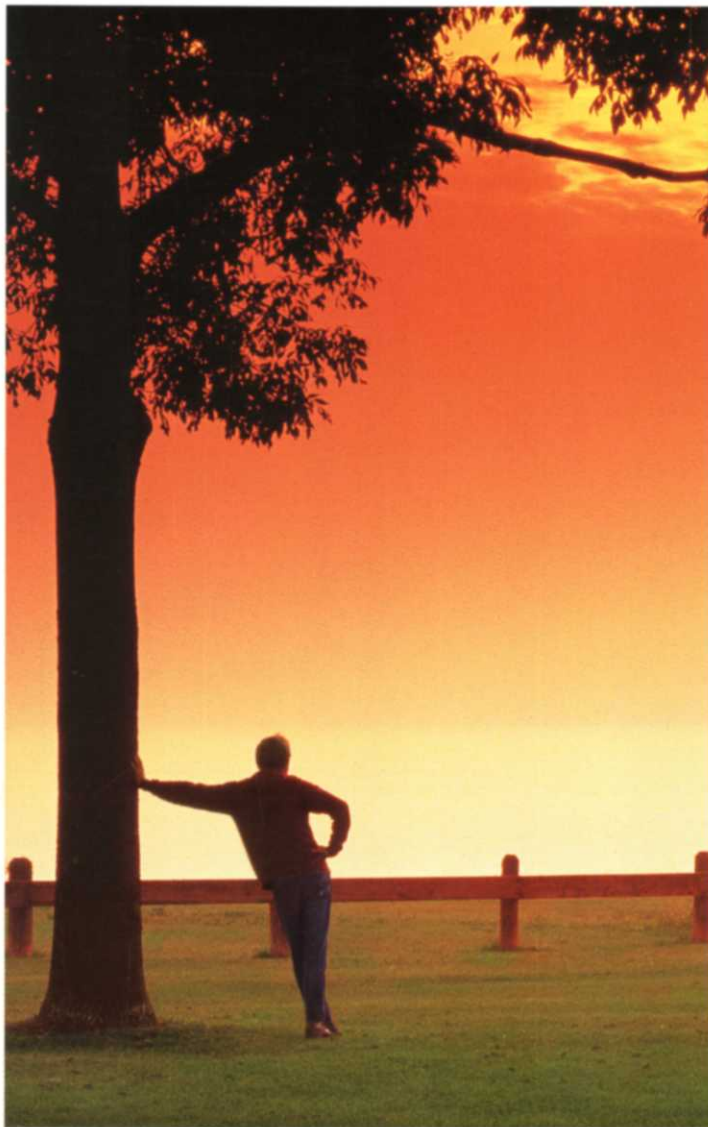
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