



The Florida Green

WINTER 2000

Number 1
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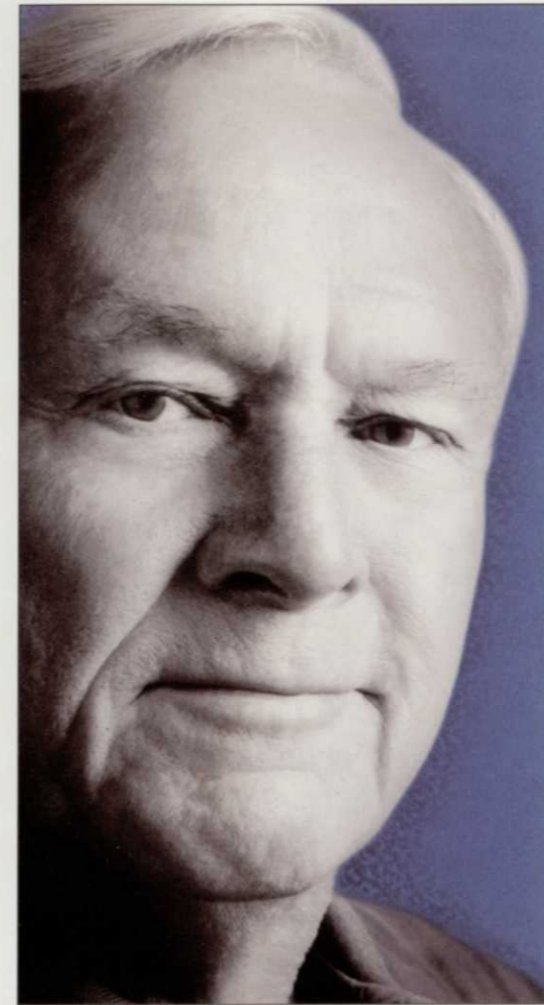
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Officers

President Darren Davis
 Olde Florida Golf Club
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 Naples, FL 34120
 (941) 353-4441

Vice President Cary Lewis, CGCS
 Renaissance Vinoy Resort
 600 Snell Isle Blvd
 St. Petersburg, FL 33704
 (727) 894-5500

Secretary/Treasurer Geoff Coggan, CGCS
 The Great Outdoors Resort
 135 Plantation Drive
 Titusville, FL 32780
 (321) 269-5004

Past President Michael Perham, CGCS
 Fountains Golf Club
 4615 E. Fountains Drive
 Lake Worth, FL 33467
 (561) 642-2724

Directors

Calusa Mike Mongoven, CGCS
 Ft. Myers CC
 (941) 278-7261

Central Florida Brett Harris
 Lake Nona CC
 (407) 826-5362

Coastal Plains Doug Abbuhl
 Seminole GC
 (850) 576-7975

Everglades Gary Grigg, CGCS
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 (941) 261-0211

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 (941) 776-2364

Treasure Coast Craig Weyandt
 The Yacht & Country Club
 (561) 283-0199

West Coast Eric Joy
 Wentworth GC
 (727) 938-6435

Staff

Association Manager Marie Roberts
 1760 NW Pine Lake Dr.
 Stuart, FL 34994
 Phone: Days (561) 692-9349
 (800) 732-6053 (Florida WATS)
 (561) 692-9654 (Fax)
 fgcsa@tcol.net (Email)



Gator at Plantation Inn G.C.
 Photo by Daniel Zelazek

WINTER 2000

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The Florida Green

Official Voice of the Florida Golf Course Superintendents Association

Published four times a year:

On the twenty-fifth of January, April, July and October

Editor Joel Jackson, CGCS
 FGCSA Director of Communications
 Address Florida Green business to:
 6780 Tamarind Circle
 Orlando, FL 32819
 (407) 248-1971 Florida Green voice/fax
 E-mail address: FLGrn@aol.com

Assistant Editor Scott Bell
 Red Stick GC
 P.O. Box 700107
 Wabasso, FL 32970
 (561) 564-7206
 (561) 564-7207 Fax

Publications Chairman Cary Lewis, CGCS
 Renaissance Vinoy Resort
 600 Snell Isle Blvd
 St. Petersburg, FL 33704
 (813) 894-5500
 (727) 823-6397 Fax
 Email: CLEWIS7711@juno.com

Business Manager Michael Perham, CGCS
 Fountains Golf Club
 4615 E. Fountains Drive
 Lake Worth, FL 33467
 (561) 642-2724
 (561) 642-5785 Fax

Editor Emeritus Dan Jones, CGCS
 West Palm Beach

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SUBSCRIPTIONS: \$20 for four issues. Contact the FGCSA office.

ADVERTISING: For rates and information, contact the FGCSA office at 800-732-6053

EDITORIAL: All inquiries should be directed to the editor, Joel Jackson, CGCS. Unsolicited manuscripts and photographs cannot be returned.

Contributors to this issue

Cover Story Principal Photographer: Daniel Zelazek

Cover Story Writer and Supplemental Photographer: Joel Jackson, CGCS

Spotlight: Geoff Coggan, CGCS; Bob Klitz, CGCS; Cary Lewis, CGCS; Joe Ondo, CGCS; Joel Jackson, CGCS, coordinator

Hands On: Mike Hamilton, CGCS; Dr. Debrah Beck; Matt Nelson; Joel Jackson, CGCS, coordinator

Professional Development: David Court, CGCS

Industry News: Dr. John Cisar; Joel Jackson, CGCS

Official Business: Dr. Kenneth Chilton

Stewardship: George McBath; Audubon International

Afterwords: Rob Kloska; Randy Korf; Mark Jarrell, CGCS; Joel Jackson, CGCS;

Proofreader: Scott Bell

Production

The Florida Green is published with the assistance of Janlark Communications, Inc.

Publication Manager Larry Kieffer

311 Havendale Blvd. #300 • P.O. Box 336 • Auburndale, FL 33823
 863-967-1385 • Fax 419-821-8746 • E-mail: janlarkcom@aol.com

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Advertising Information

The Florida Green welcomes advertising inquiries to:

Marie Roberts, Association Manager

1760 NW Pine Lake Drive

Stuart, FL 34994

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As we enter the new millennium, it seems an appropriate time to talk about technology, and computers in particular.

Y2K does not mark the beginning of the computer craze. However, it should make you aware that computers are here to stay and our dependence on them will undoubtedly continue to grow. If you have been hesitant to become more computer

savvy, maybe the tremendous hype about Y2K will provide the incentive to expand your skills.

For many golf course superintendents, using a word-processing program or spreadsheet on a computer has become an integral part of the job, but are you using your PC to log on to the Internet or communicate by E-mail? If your answer is no, more

than likely you will be very soon. If you do not, you might find yourself being left behind by a younger, more technologically advanced society.

Am I being melodramatic? I don't think so. If you need proof just look into the classroom at your local school or ask your children. Computers are being taught in school. They have become a required part of today's curriculum beginning as early as elementary school.

It is not just the younger generation that is becoming proficient with computers. My parents who are both retired from non-computer-oriented fields "surf the web" on a regular basis. They use their home PC to track their investments, communicate by E-mail, shop on line, plan their next vacation and even plan the nightly meal. Like many others, their PC has become a part of their everyday life.

If you do not (regularly log onto the Internet and communicate by e-mail), you might find yourself being left behind by a younger, more technologically advanced society.

People have balked at the thought of computers becoming an essential part of everyday life. Many moviegoers may feel Hollywood is being overly dramatic with the rash of high tech, futuristic movies that have been released in the last couple of years. Some of the flicks may surpass what most adults will see in their lifetime, but the films may not be as farfetched as you think. The bottom line is that understanding technology is just not an option anymore. It is quickly becoming a necessity and you should ask yourself, "Am I ready?"

Another question you might ask yourself is, has the phrase, "you've got mail," become common in your daily life? It should be. In fact, according to a recent study, one quarter of the U.S. adult population uses E-mail every day! Seem like a lot of people? Well, the same study found that approximately 64.2 million U.S. adults (32.5 percent of the adult population) currently use the Internet regularly. The computer is rapidly replacing many everyday tasks.

One example is the routine phone call. Many of these communications do not require person-to-person contact and the computer is allowing us to relay information more efficiently with electronic mail. The time we often spend waiting on hold or playing phone tag can now be avoided by sending or responding via E-mail.

It's A PC World!

PRESIDENT'S MESSAGE



Darren Davis
President
FGCSA

Computers are as popular as many home appliances and they are here to stay. According to one study, home infiltration of the PC has nearly doubled from 29 percent in 1995 to 54 percent in 1999. The study goes on to say that, "The increase in PC ownership is due, in large part, to first-time PC purchases." It adds that over the last two years, the largest gains in home PC purchases has been among low- to middle-income households as well as households with children.

The price tag on a computer should not be an excuse for waiting on a purchase. Prices are now affordable for most everyone and there are also other options available such as leasing. Some

people feel that with technology advancing as rapidly as it has been, leasing may be the smarter avenue to take.

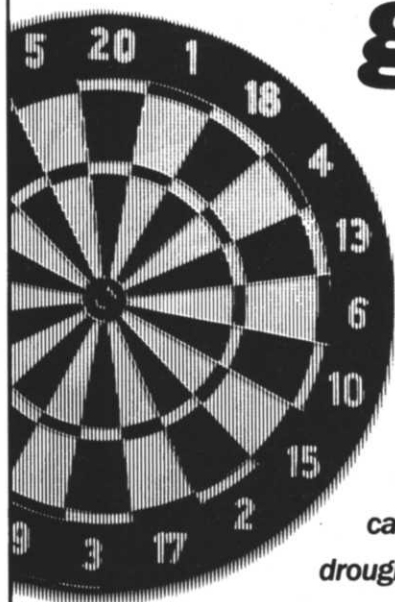
Computers are becoming common in our turf management facilities. They are used for word processing, controlling our irrigation systems, tracking inventory and even our equipment managers are utilizing software to track preventive maintenance on our equipment. The days of "old-style green-keeping" are rapidly disappearing in most areas and are being replaced with more advanced technology and higher demands among golfers.

The use of computers by golf course superintendents will increase rapidly in the future.

While personal communication is still vital, E-mail is quickly become a mainstream method of communication. Web sites are also becoming everyday tools for many professionals in our industry. Web sites serve as a valuable public relations tool that allows our associations to spread the good word to the general public about the benefit of a golf course and the professional golf course superintendent. If you have not already perused the GCSAA web site (www.GCSAA.org), I urge you to do so and look for the FGCSA web site (www.FloridaGCSA.com) coming on line in the very near future!

Happy New Year and see you on line!

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Dale Kuehner Gets FGCSA Distinguished Service Award

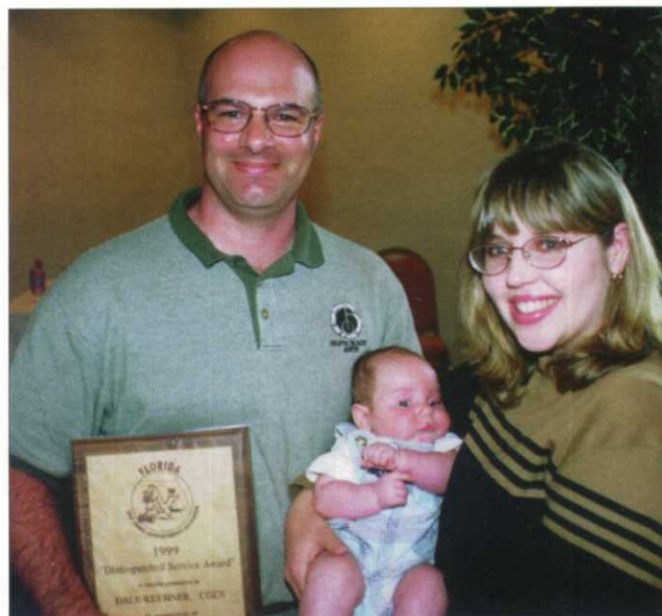
Dale Kuehner, CGCS accepted the 1999 FGCSA Distinguished Service Award at a ceremony held at his own Colony West Country Club Oct. 8. Members of the South Florida GCSA and other FGCSA members were in attendance participating in the SFGCSA's Benefit for Children tournament held annually at Colony West.

This event provided the perfect opportunity for the FGCSA and the South Florida chapter to show its appreciation for all the extra efforts Kuehner has contributed to our associations. He had the opportunity to offer a sincere and emotional acceptance speech at his club, with his family, friends and co-workers present.

Ten years ago Kuehner was invited to join the SFGCSA board of directors. His first illustrious position was the shirt salesman for the SFGCSA chapter. The shirt salesman board appointment is a testing position where the current board members evaluate the patience, perseverance and abilities of the board rookies as they drag the 80-pound shirt boxes from meeting site to meeting site, often selling only one shirt per month. The board members figure that if the new inductee doesn't carp and complain during this 12 months of torture, they just might be able to serve a more valuable role in the future.

After Kuehner's dazzling performance as a shirt salesman (six shirts in six months), he advanced through the SFGCSA board positions of chairman of meeting sites, education, etc. Ray Hansen was president of the SFGCSA about this time and was also serving on the Florida GCSA board. He asked Kuehner to assume the role of external vice president for South Florida. When Dale started attending the state board meetings he quickly became involved in many of the FGCSA committees including research, certification and the biannual membership budget survey.

As Dale expressed his desire to continue his volunteer service in our association, Mark Jarrell, CGCS and Kevin Downing, CGCS asked Dale to serve as FGCSA secretary/treasurer in 1994. Each year the immediate past president is in charge of the nominating committee and consults with current



Dale Kuehner's pride in being named winner of the 1999 FGCSA Distinguished Service Award is surpassed only by the birth of his son Ian. Dale's wife Cindy and Ian were on hand to watch Dale receive the award at the South Florida Missing & Exploited Children's Tournament. Photo by Steve Pearson.

board members and other past presidents to discuss potential candidates from the external vice presidents who appear to be the most active and productive.

Also during this time, Ray Hansen was serving as the Florida voting delegate to the GCSAA and had indicated he would like to step down from this role. Kuehner stepped forward and volunteered to represent the FGCSA at the national level. He is one of the few individuals who has attended all seven of the GCSAA chapter delegates meetings now held annually in September at headquarters in Lawrence, Kan.

Now with exposure to national issues and activities Dale became involved in GCSAA committee service. He is currently serving on the membership standards resource group and the professional development initiative. The responsibilities for these committees include four visits to Kansas each year, and a requirement to become very familiar with all the material sent by GCSAA

Dale's Supporters and Mentors

Merl Smith: Toro representative in Pittsburgh. Helped Dale with many technical problems when he worked up North. Taught Dale about turf diseases and convinced him to attend Penn State. Introduced Dale to Tom Fox, golf course superintendent.

Tom Fox: Golf course superintendent. Also pushed Dale into Penn State. Convinced Dale to take his career seriously, and involved Dale in all aspects of golf course maintenance.

Edward Rack: Dale's grandfather. Owned Seven Springs C.C. in Elizabeth, Pa. During Dale's early years (18-24), he would argue with his grandfather about wanting to do things his way. Now Dale realizes grandfather was usually correct most of the time.

Dr. Joe Duich: Penn State University. Convinced Dale to work with his family and not strike out on his own. Dale's patience paid off when the family purchases Colony West.

Ray Hansen and Paul Crawford: Assisted Dale in his development through his roles in the SFGCSA, FGCSA and GCSAA.



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4. Get the big picture of the industry. There's more to it than growing turf on the greens.
5. Develop a support group of peers you can turn to for turf problems, vendor information or job search support if you lose your position.
6. No matter how good you think you are, sometime you will need to turn to someone for support or advice.
7. Our associations need volunteers. Many have done it before you. Now it's your turn!

so you can provide input and make comments and adjustments to the program. Kuehner's service to our

association and to the industry has been supported by his wife Cindy, his family and his assistant superinten-

dent, Gary Chaney. Kuehner's commitments result in many days away from the property and his family, including his six-month-old son, Ian. What motivates him to continue to be so involved, even after 10 years of dedicated service?

At the local, state and national levels, the driving force for Kuehner appears to be the camaraderie and support he receives from his fellow superintendents. He once referred to the "good old days" when the South Florida board consisted of Ron Wright, CGCS (now in Mobile, Ala.), Mark Richard, CGCS (now in Ft. Walton Beach), Al Ross, CGCS, Bill McKee, Steve Kuhn, Ed Miller, Bill Entwhistle, Jr., Joe Panteleo, Jim Lindsay, CGCS

(now in South Carolina), Kelly Cragin, and yours truly.

During our board meetings or over dinner after a monthly chapter meeting, the secrets of growing quality turfgrass, the challenges of balancing careers and families, and the current events of the month were discussed with laughter and understanding that can only be shared by those who have a common career.

Fast forward to last October. Kuehner was overwhelmed and shocked when he was presented the Distinguished Service Award. He felt that the DSA was reserved for people at the end of their careers.

With only 10 years of board service to date, Kuehner is hoping to

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continue to lend his support to the FGCSA. He had a hard time describing his emotions about winning the award. He is a quiet person who enjoys working behind the scenes, and out of the limelight. His involvement at all levels forced him to become a better speaker, and to be more comfortable when addressing large groups. But his actions speak louder than words!

Kuehner's service and support of his associations will continue, but the birth of his son has him enjoying the special feelings of fatherhood. He says he has adapted well to the schedule changes that come with parenthood, and he describes Ian's easy going

disposition with much love, affection and wonderment.

Kuehner used to get excited about a new Rain Bird irrigation program to play with; now it's Ian's photo on his computer screen saver. Dad can't quit smiling about the tours Ian takes with him on the golf course and Cindy's dressing Ian up in little reindeer antlers for the holidays. It's going to be a special holiday season in the Kuehner household this year!

Dale, thank you for your many years of support and energy you have dedicated to the local, state, and national superintendent associations. If the rest of us could make a commitment that was 10 percent of yours, we would have more

volunteers than we could possibly use. Thanks, Dale, and congratulations!

*BOB KLITZ, CGCS
General Manager
Orangebrook G.C.*

EVERGLADES GCSA

Dale Walters Recognized with President's Award.

Dale Walters is an Ohio buckeye who took root in Florida 24 years ago.

As a 12-year-old lad in Dayton, Ohio, Dale somehow made the connection between his youthful lawn mowing jobs and his growing love of golf. When college time rolled around, he enrolled in Ohio State, but transferred into the Lake City Community College Golf

1999 FGCSA President's Award Winners

- Paul Hickman
- Dave Hollar
- Steve Pearson
- Al Ross
- Dale Walters

Course Operations program to finish his training since Ohio State did not have a similar program at the time. He graduated from Lake City in 1975.

Nearing graduation at Lake City, Walters saw an article in *Golf Digest* magazine talking about the John's Island Club putting in another 18 holes. He took a

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Everglades Past President Dale Walters, left, is presented a 1999 FGCSA President's Award for Lifetime Service by Gary Grigg at the EGCSA September meeting. Photo by Joel Jackson

chance and submitted his resume and landed the job. The following year Dale moved to Naples, FL to assume the duties of superintendent of the Moorings Country Club. In 1991, Dale moved to the Royal Palm CC where he remains today.

When asked about those people who had the biggest influences on his career Dale responded, "Dr. (Gene) Nutter from Lake City

certainly was the biggest academic influence in learning the business. Superintendents Charlie Jarrell and Bubba Luke were early mentors who gave me a job, let me do my job and gave me good advice on how to deal with people. I would have to also give credit to all of my past green committee chairmen (about 20 of them) who influenced me for the good, the bad and the ugly."

Gary Grigg named for GCSAA DSA

Florida's own Gary Grigg, CGCS, MG of the Royal Poinciana Golf Club in Naples has been named as the recipient of GCSAA's Distinguished Service Award for 2000. He will be presented this prestigious award during the opening ceremony of the 71st International Golf Course Conference and Show in New Orleans Feb. 16.

Grigg served as president of the GCSAA in 1995. He didn't retire from association service when he moved to Florida. He is currently serving as the external vice president of the Everglades GCSA, and he is still active on GCSAA committees. Congratulations to Gary from all of his Florida friends and peers, and thanks for all the time and effort spent to make the golf course superintendents profession and associations just a little better.

Walters became involved in the Everglades GCSA and the Golf Course Superintendents Association, volunteering his time to serve on committees and the board of directors of the EGCSA. He completed his CGCS certification in 1986.

Walters is a past president of the Everglades GCSA and served as the chapter delegate to GCSAA for three years. He has been a speaker at two GCSAA International Conferences and he is currently serving on the GCSAA Information Services Committee. He has also taught turf management classes at Edison Community College on Disease Identification and Introduction to the Golf Course Industry.

About his personal work and life philosophies Walters says, "I'm still a work in progress. I pray for rain then I pray for rain to stop. I pray for the bugs and disease to go away and I pray for the crew to show up for work. I also pray for the members to be happy. My faith is an influence on everything I do or say and how I manage my life, my work and my family."

As far as memorable moments go Dale reverts to his buckeye beginnings. He says, "The best moments are when Ohio State beats Michigan, which doesn't happen often enough." He quickly adds that among his most treasured memories were the 11 days he spent with his wife touring England, Scotland and Wales.

Walters has been married to his wife Connie for 29 years and has four children, Carrie Hope (24); Amanda

Faith (20); Joshua (13) and Charity Grace (12). Dale says his hobbies and interests include watching Josh catch fish while he doesn't and being active in his church.

JOEL D. JACKSON, CGCS
FGCSA Director of Communications

GCSAA REGIONAL SEMINARS

Regional Seminars Wrap Up 1999 Education Calendar

As 1999 came to a close, three FGCSA Affiliated Chapters held GCSAA Regional Seminars to provide continuing education credits for Florida superintendents seeking certification or recertification.

The FGCSA works with the local chapters to coordinate the dates and seminar selections to avoid schedule and topic conflicts.

The South Florida Chapter held a seminar in July at the Orangebrook GC in Hollywood. Dr. Charles Peacock presented a program on "Protecting Natural Resources on Golf Courses." Then in September in Orlando, the Central Florida Chapter presented "Human Resource Management" with longtime GCSAA faculty member, Dr. Bree Hayes. The North Florida Chapter in Jacksonville finished off the series of regional seminars in November with a program on "Integrated Disease Management for Bermudagrass Golf Courses." presented by University of Florida turf pathologist, Dr. Monica Elliott.

These eight-hour, college-level presentations are worth .7 CEUs each for the attendees who must attain a

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Dr. Bree Hayes, popular GCSAA seminar instructor, conducts a one-day seminar on Human Resource Management in Orlando. Photo by Joel Jackson.

minimum of 10 continuing education credits in a five-year period since their last certification. Seven of the ten units must be tested programs and the attendees must pass written exams at the end of the seminar. The remaining three units can be from attendance of other local education which have been approved in advance for professional develop-

ment (PDU) credit by the GCSAA.

GEOFF COGGAN, CGCS Education Chairman

FGCSA GOLF CHAMPIONSHIP

Central Florida Chapter Sweeps State Golf Titles

The Central Florida Chapter swept the 1999 FGCSA Golf Championship

by taking all the top spots in the individual and team events this year at the Southern Dunes GC in Haines City Oct. 4.

Ten teams from eight

chapters participated, making this the largest turnout so far for the four-year-old event. Teams consist of five players with the four lowest scores being counted.



Central Florida superintendents dominated the 1999 FGCSA Golf Championship. From left, Chris Cartin took low medalist honors and led Kevin Rotti, Joel Brownsberger, Jim Lawrence, and Hal Richburg(not pictured) to Team Low Gross victory. Photo by Joel Jackson.



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Chris Cartin from Deltona Hills GC shot a 74 over the rolling, windswept course for the low round of the day and earned a spot on the Florida No. 1 team competing in the GCSAA Golf Championships to be held in Mobile, Ala. in February 2000. Cartin joins Mark Hopkins, Poinciana GC, winner of the Poa Annua Classic and Hal Richburg, CGCS, Heathrow CC, winner of the Crowfoot Open. The fourth spot, determined by the superintendent with the low average in two out of three of the above events, was claimed by Joe Ondo, CGCS, Winter Pines GC.

The Central Florida Team No. 1 of Joel Brownsberger, Chris Cartin, Jim Lawrence



1999 Blue Pearl Committee heads up event at The Medalist Club that earned \$17,200 for turf and environmental programs for Martin County schools. From left, Steve Keller, Bo Estey, Barbara Tierney, Bobby Ellis, Greg Pheneger, Roy McDonald, Bill Lanthier and Craig Weyandt. Photo by Joel Jackson.

and Hal Richburg and Kevin Rotti took won the low gross division by three shots over Central Florida Team No. 2 made up of Buck Buckner, Joe Ondo, Chad Sartain and Barry Shuman. By virtue of their strong second-place

finish, Central Florida Team No. 2 captured the Low Net honors.

The FGCSA Golf Committee would like to thank host superintendent Bayne Caillavet and Southern Dunes head golf professional

Eddie Frye for helping make this another great event.

JOE ONDO, CGCS
FGCSA Golf Chairman

TREASURE COAST GCSA

Blue Pearl Dodges Floyd, Beats Harvey to the Punch

Postponed by Hurricane Floyd and just beating Tropical Storm Harvey to the punch, the 1999 Treasure Coast Blue Pearl Tournament managed to fulfill its mission on Oct. 4 at Greg Norman's Medalist Club in Hobe Sound.

Begun as a fund raiser for the Audubon Sanctuary Program for local schools, the success of the event has expanded the beneficiaries to include a new turf program

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From left: Nancy McBride and Mike Christiansen of the Florida Branch of the National Center for Missing and Exploited Children receive a check for \$14,000 from South Florida GCSA members Bryan Singleton, Bill McKee, Dale Kuehner, Jim Goins, Bill Enwhistle, Jr., and Bob Klitz. Photo by Steve Pearson.

at South Fork High School. This year TCGCSA President Greg Pheneger was able to present a check for \$10,000 to Southridge as well as a check for \$7,200 for the ACSP program.

The Treasure Coast wishes to thank host superintendent Tim Rappach and the entire staff of The Medalist Club for the excellent condition of the course and the impeccable service and operation of the event.

JOEL JACKSON, CGCS
Dir. of Communications

SOUTH FLORIDA GCSA

15th Annual Event Raises \$14,000 to Benefit Children

The 15th Annual SFGCSA Benefit for Children's tournament was held at the Colony West C.C. in Tamarac Oct. 8.

Another fun and financially successful event was enjoyed despite the relentless rains of this year's tropical season. Even though the golf had to be canceled after nine holes, the food and festivities continued which included a presentation by Nancy McBride and Mike

Christiansen of the Florida Branch of the Center for Missing & Exploited Children.

They reported that due in part to the loyal support by the SFGCSA and others:

135-170 cases are reviewed every month

257 child recoveries were performed in 1999 through September

76 educational presentations were made to 2,038 people

42 training sessions were performed with 1,180 law enforcement officers

Child safety literature and materials were developed and distributed.

This year's contribution from the SFGCSA tournament came to \$14,000. This brings the total contributions to the M & E Children's Center to \$125,000 over the history of the event.

BOB KLITZ, CGCS
SFGCSA M&E Committee

WEST COAST GCSA

36th Quandt Event Aids Research and Education Funds

The 36th Annual Bud Quandt Turfgrass Research and Benefit



Tim Williams, public relations director for Gatorland, discussed gator management on golf courses at the 1999 West Coast Bud Quandt Turf & Benefit Tournament. Photo by Cary Lewis.

Tournament came off without a hitch on Oct. 11 at the Pasadena Yacht and Country Club in St. Petersburg.

The primary fund-raising event for the West Coast GCSA provides monies for turf research, scholarships and donations to benefit local charities.

The day-long event includes a welcome breakfast buffet at registration, a business meeting and educational session, a four-

man scramble tournament followed by an awards ceremony and reception.

University of Florida IFAS Turf Coordinator Dr. John Cisar was on hand to update the audience on IFAS personnel changes and research projects to the turf program. Tim Williams, public relations director of Gatorland in Kissimmee talked about facts, myths and safety issues when dealing with alligators on golf courses. The bottom line is there are ways to manage alligators on your property without resorting to trapping and removal.

The golf tournament followed the meeting and the team of Duane Van Etten, Mark Wheaton, John Robertson and Jim Ahern took low gross honors with a 55. The low net winner was the team of Roger Hruby, Steve Lyerly, Johnny Nevill and Chip Powell. Skill contest winners were: Closest to the Pin No. 2 Terry Teats, No. 8 Bill Moore, No. 11 Buddy Carmouche and No. 16 Alan Niblett. Long Drive - S. M. Johnson. Accurate Drive - Bob Ley. Putting



University of Florida's IFAS Turf Coordinator, Dr. John Cisar gave an update on turf projects and personnel during the business meeting at the West Coast GCSA Bud Quandt Tournament. Photo by Cary Lewis.

*36th Annual
Bud Quandt Turfgrass Research and Benefit Golf Tournament*

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contest - Ryan Willis.

West Coast President Dale Reash would like to pay special thanks to Gerald Marquardt, superintendent of Largo Municipal GC, for selling a record high \$1,400 worth of raffle tickets to help raise money for the event.

CARY LEWIS, CGCS
FGCSA Vice President



Chapter leaders for the newly formed Calusa GCSA, from left. Front row: Ed Stalnos (membership chairman), Joe Boe, president and Tim Price (supplier liason). Back Row: Rick Mohr (golf & education chairman), Greg Laue (secretary/treasurer) and John Stach, (vice president). Not pictured Mike Mongoven (external vice president). Photo by Joel Jackson.



Calusa GCSA President Joe Boe, left, presents FGCSA Director of Communications Joel Jackson with a check for \$1,000 for the FGCSA Research Fund at the inaugural Calusa Su-Pro-Liers Turkey Shoot. Photo by Rick Mohr.

CALUSA GCSA

Su-Pro-Liers Trade Turkeys for Turf Research

The FGCSA's newest chapter, the Calusa GCSA, hosted its first fundraiser for turf research on Nov. 11 at the Heritage Palms Golf Club in Ft. Myers.

Called the Calusa Su-

Pro-Liers Turkey Shoot, the three-man scramble format teams up a superintendent with a golf pro from his club and a turf supplier who

services the region. Teams were selected by suppliers blind-drawing the superintendent/pro twosome from each club.

Winners of the closest-to-the-pin and long-drive

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contests were presented gift certificates for turkeys from Publix supermarkets.

Low gross and net winners received gift certificates for golf merchandise from the Heritage Palms pro shop.

This inaugural event was attended by nearly 40 people and consisted of golf, lunch and an awards reception.

Though they have been in existence less than a year, the Calusa Chapter has joined the quest for turf research and education by donating \$1,000 to the FGCSA Research Fund and \$500 to the Edison Community College Turf Program.

*JOEL JACKSON, CGCS
Dir. of Communications*

CENTRAL FLORIDA GCSA

Disney Employee Receives Burgess Scholarship

Five years ago the Central Florida GCSA began the Danny Burgess Memorial Scholarship Tournament to honor the 30-year-old superintendent of Windermere C.C. in west Orange County, who was killed in a boating accident in 1994.

The CFGCSA, working with the Windermere C.C. staff and members, commemorates Burgess' memory with a tournament which raises money for scholarships for students at Lake City Community College's Golf and Landscape Operations Program or the Westside



Aspiring golf course superintendent Ricky Craig received a \$1,500 Danny Burgess Memorial Scholarship from the Central Florida GCSA to attend the Lake City Community College Golf Operations A.S. degree program. Photo by Joel Jackson.

VoTech Turf Technician program in Ocoee.

This year, Ricky Davis of Center Hill was the recipient of a \$1,500 scholarship to attend Lake City. Davis learned basic horticulture



This bronze plaque rests at the foot of a live oak tree on the first tee of the Windermere Country Club. Photo by Joel Jackson

skills in the landscape/nursery business, but has been working the past couple of years for Scott Welder at Disney's Magnolia and Palm golf courses to qualify for the LCCC Golf Course Operations program.

*JOEL JACKSON, CGCS
Dir. of Communications*

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The Great Outdoors Golf Resort, Titusville

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— Geoff Coggan, certified golf course superintendent at The Great Outdoors and immediate past president, Central Florida Golf Course Superintendents Association



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Cobblestone Country Club, Palm City

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— Lee Bladen, golf course superintendent, Cobblestone Country Club



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Atlantis Golf Club, Atlantis

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— Karl Schmidt, golf course superintendent, Atlantis Golf Club



Atlantis superintendent Karl Schmidt is sold on new Valent ORTHENE 97.

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Number 8
Par 3
Lagoon Course
Photo by Daniel Zelazek.



Plantation Inn & Golf Resort

Welcome to the Nature Coast

BY JOEL JACKSON, CGCS

Editor's Note: By request, this story is dedicated to the memory of William Joe Brooks. Dedicated and loyal Plantation Inn employee of 38 years.

The Plantation Inn & Golf Resort is located on the Crystal River nine miles from the Gulf of Mexico where the river meets U. S. Hwy 19 some 60 miles north of Clearwater. This area is near the beginning of coastal Florida's low country that extends all the way around the Big Bend area to Carrabelle and St. George Island.

There are no sandy barrier islands here with high-rise condos. The coastline is marsh grass and hardwood swamps punctuated by river mouths with names like Chassahowitska, Homosassa, Withlacoochie, Crystal, Wacassa, and the famous song-inspiring Suwannee. Florida has its First Coast (Jacksonville), Space Coast



Glenn Oberlander

Personal: Originally from Chicago, Ill. Family: Wife Delia; children Glenn Jr. (9), Raymond (15), Ryan (17) and Marissa (20).

Education: 1973 - Seminole HS, Seminole; 1975 - Lake City Community College Mechanics School; 1977 - A.S. degree, Lake City Golf Operations Program.

Employment history: 1979 to present, superintendent, Plantation Inn C.C.; 1977-78 assistant superintendent, Sheraton Savannah Resort, Savannah, Ga.; 1969-73 from laborer to assistant superintendent, Bardmoor C.C., Largo, FL.

Professional affiliations: Class A GCSAA member and member of FGCSA and FTGA (17 yrs). Past president (2 yrs) & board member (5 yrs) West Coast GCSA. past president (2 yrs) & board member (5 yrs) Seven Rivers GCSA. Chairman of the Envirotron Golf Classic (7 yrs).

Mentors: My father Walt Oberlander started me playing golf at age 2. I've loved it ever since. Dad also taught me you can succeed if work hard and get an education. No one can ever take that away from you. My brother Greg Oberlander got me a job as a service man at Bardmoor CC in 1969. There I learned to love maintaining golf courses. Got to help build the East Course at Bardmoor.

Goals: Graduate from college. Own my own golf course some day.

Accomplishments: 21 years with the Plantation Inn. Helped form the Seven Rivers GCSA. Got involved in our associations early in my career. You never stop learning.

Philosophy: Treat your employees like you would want to be treated.

Advice: A golf course superintendent works long, hard hours. It can take a toll on personal and family life. Make sure they understand what you do and why you do it. "To be a successful manager, surround yourself with quality people and provide them with an enjoyable, fulfilling work environment."

Memorable moments **Happy** - Landing, tagging and releasing a 7-foot sailfish with my name on it. I'll never forget my surprise 40th birthday party. My wife Delia really got me!; **Sad** - Losing one of my best friends and co-workers, Joe Brooks, to cancer. He was the most devoted family man and dedicated employee I have ever experienced in my life.

Hobbies: Like to play the stock market. Fish whenever I can find the time. Golf. Travel to the Blue Ridge Mountains every winter.



(Cocoa Beach), Treasure Coast (Vero Beach), Gold Coast (Ft. Lauderdale-Miami), Suncoast (Sarasota-Tampa). And now this area is billing itself as the Nature Coast.

The many spring-fed rivers that flow to the Gulf in this area become warmwater havens for the endangered seagoing manatees. The Crystal River has a population of 380 manatees each year in winter. The guests of the Plantation Inn are treated to views of the manatees as they cruise the spring-fed creek behind the hotel.

Since the remote coastline in this region is not accessible for the same type of rampant development so common along most of Florida's shores, hotels like the Plantation Inn are rare and thus appealing destinations for those seeking a more secluded getaway location for vacations and small business conferences.

Over the years, the Plantation Inn has hosted celebrities like Elvis and golfing legends Sam Snead and Tommy Bolt, who used to drop by in the early 60s for a little fishing after the PGA Tour's Florida leg and before the Masters tournament. Some of their memorabilia is displayed in the Inn.

The Inn recently underwent a major renovation of the 144 rooms, a total which includes 12 villas and six condominiums. There is also a conference center which can host up to 300 people.

The Inn has had a long history of repeat business from groups who have enjoyed the special brand of southern hospitality over the years. The pool area is being completely revamped this year and there is also a full-service marina as part of the hotel's amenities.

Someone else who has a history with the Inn is Glenn Oberlander, the golf course superintendent for the past 21 years. One of Glenn's career goals after graduating from college was to find an employer who would treat its employees more than just a number.

Oberlander accomplished that goal with the William Caruth family which owns the Plantation Inn.

"The Caruths are just good, down-home people," said Oberlander. "Mr. Caruth told me long ago, 'I'm not going

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Number 3 on the Lagoon nine. The Lagoons Course is a little tighter layout than the original Championship course, giving guests a challenging change of pace. Superintendent Glenn Oberlander helped the owner Mr. Caruth design and build the new nine. Photo by Daniel Zelazek.

to tell you how to run the golf course. That's why I hired you. However, I may want to try some little projects from time to time. It's my money and we'll try it, whether it works or not."

"For example, we've planted lots of trees over the years and we even built the nine-hole Lagoons Course in-house in 1980. It's obviously been a good experience or I wouldn't have stayed here this long. I got a taste of working for a tyrant of a boss during one of my assistant-superintendent jobs. This misguided individual took sadistic delight in scaring employees and intimidating them. I vowed that if I ever became a superintendent I would treat my employees with a lot more respect."

Oberlander seems to have done just that. While he acknowledges some recent turnover, he also has employees with 12-14 years of service with him. "Depending on the circumstances, I don't

adhere to a three-strikes-and-you're-out policy. Even good employees can have some bad times. I try to be sensitive to what's going on in their lives, and work it out whenever we can."

At the beginning of this story was a dedication to William Joe Brooks. Brooks worked for the Plantation Inn for 38 years until he passed away recently. He was the irrigation technician and one of Oberlander's weekend supervisors. "Losing Joe was tough," Oberlander said. "He was one of my best friends and the most devoted family man and dedicated worker I have ever known in my life."

Oberlander is also losing his shop manager who is moving back home to the Lake City area. He plans to promote his assistant mechanic and give one of the crew members a shot at the assistant's position. He believes in promoting from within the organization to show the staff that hard work does pay off, a trait he

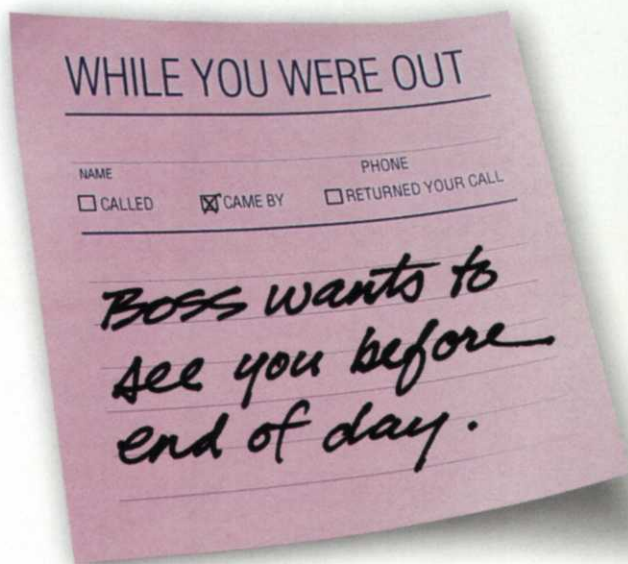
says that was instilled by his father Walt Oberlander.

"Dad told me you can succeed only if you work hard and get an education. No one can ever take that away from you."

Oberlander's education came from the Lake City Community College's Golf Operations program. Oberlander first graduated from the mechanic's program in 1975 and received his A.S. in golf course operations in 1977.

His first look at golf began as a two-year-old playing at golf with his father. His brother Greg, now at Mission Valley, got him a job on the crew at Bardmoor CC in 1969 where he developed his love for maintaining golf courses. He worked his way up to assistant superintendent and then went to Lake City for his formal education.

In his 21 years at the Plantation Inn, Oberlander has watched the fads and trends in turf management come and go



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Number 7 Lagoons Course, Plantation Inn Golf Club. Photo by Daniel Zelazek.

Plantation Inn Country Club

Location: Town of Crystal River in Citrus County

Ownership: The William Caruth family out of Dallas, Texas.

Playing policy: Resort guests and general public.

27 holes: The 18-hole, par-72 Championship Course was designed by Mark Mahannah and opened in 1957. The 9-hole, par-36 Lagoons Course was designed and built in-house and opened in 1981.

Management: General Manager, Chris Kehn; Golf Course Superintendent, Glenn Oberlander.

Major Renovations/Projects: Just completed a new pesticide storage building and a self-contained mix-and-load site. Recently completed a five-year, concrete-cart-path project for all 27 holes. We plan to rebuild several ladies tees. We will begin a program to add irrigation to the unirrigated rough areas a few holes at a time. In 2000 we will resume a 15-year tree-replacement program that was stopped in 1993. The inn just completed renovations to all the hotel rooms. In 2000 the pool will be replaced with new pool and spa and new landscaping. The main entrance will be redesigned, rerouting the road and adding new landscaping.

Acreage under maintenance: 220 acres of turf. **Greens:** 3.5 Acres, average 4,500 sq. ft.; Tifdwarf and 328. We raise the height of cut in the summer; green speed goals 8-9 in the winter, 7-8 in the summer; overseed with *Poa trivialis* at 20-25 lb./1,000 sq. ft. **Tees:** 3 acres Everglades bermudagrass and Tifway 419. HOC 3/8 inch; overseed with perennial rye at 15 - 20 lb./1,000 sq. ft. **Fairways:** 35 acres Everglades bermudagrass and Tifway 419; HOC 9/16 inch year round. Overseed with perennial rye at 350 lb./acre. **Roughs:** 175 acres — 60 Everglades and Tifway 419 cut at 1.25 inch all year and 115 natural rough and bahiagrass cut at 2.5 inch all year. Overseed only the slopes around tees and greens with perennial rye at 300 lb./acre.

Bunkers/Native Areas: 70 bunkers, sand type 37M & 37C. All are machine raked with a Cushman-Ransome unit with standard tines and flaps. Pot bunkers are hand raked. There are 2 acres of pine straw native area.

Waterways: 28 lakes and ponds covering 20 acres. Lake management by Aquagenix. Wanted professional contractor responsible for maintaining water quality with manatees in our canal.

Irrigation source: Surface water and two wells. Main station is PSI surface-water system with 75- and 30-hp pumps. The two well stations each have 30-hp pumps. The control system for the 500 heads is Toro Osmac. We have fertigation capability for wetting agents and fertilizing, but it is not used very often.

Staff: Including the superintendent, 15 full time and 1 part time, including 4 landscape staff. Average weekly budget 700 hours straight time. Assistant superintendent John Shuff; shop manager Cliff Ford; assistant equipment technician Bob Slanker; part time administrative assistant and equipment operator Alice Greenman; landscape supervisor Rose Humenik. Special posthumous recognition of our irrigation technician, William Brooks, a 38-year veteran employee who recently passed away.

Plantation Inn Wildlife: Alligators, bald eagles, cormorants, coots, egrets, fox, herons, ibis, manatees, osprey, sandhill cranes, wild hogs, wood stork and many varieties of fish. For safety reasons we are building an osprey nesting tower so we can remove the dead pine tree that they have been using. A unique feature of the Plantation Inn is that our guests can view manatees in the canals behind the hotel that connect to the Crystal River.

and admits to following the crowd for awhile.

"I used to beat myself to death trying to keep the greens shaved down and rolling faster and faster, keeping up with the Joneses around the state. Then I realized what our resort clientele really wanted was just good, consistent greens.

"Six years ago I did a study of greens heights and scoring. For four months we tracked handicaps after I raised the height of cut slightly. On average, for men and women, their handicaps dropped three shots. Some complained that their putts were coming up short, but they were tapping in for pars and bogeys instead of fighting four-footers they had blown past the cup.

"It taught me a lesson. I want to have people walking off our course with a smile on their faces having shot the best round of their lives. Those people will be back. We strive to keep our green speeds in the 8 to 9 range depending on the season."

One of Oberlander's challenges on the greens is the turf itself. The Plantation Inn rebuilt the greens in 1987 and ended up with a bad batch of Tifdwarf like so many greens built in that era. Now plagued with off-type patches on the greens, they're always playable but their appearance is subject to the weather conditions.

"The off-type spots don't like hot weather," he said. "The closer we get to 100 degrees, the more they go off color. Sometimes you think you've got hot spots, but as soon as the temperature drops back down to the lower 90s they green up. Of course they don't like verticutting or close mowing either, which makes a case for raising the height of cut."

Like moderation in heights of cut, Oberlander has made a conscious effort to return to basics in turf management.

"I have seen a lot of superintendents, especially the younger ones, trying every new product that comes down the pike

I used to beat myself to death trying to keep the greens shaved down and rolling faster and faster... Then I realized what our resort clientele really wanted was just good, consistent greens.

in an effort to grow the perfect turfgrass. For one thing it just isn't going happen. Mother Nature is just too fickle for us to be perfect.

"Instead, I concentrate on being playable, not perfect. Maybe that's just maturity kicking in. Anyhow, I have gotten

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Number 4 on the Lagoon nine. Photo by Daniel Zelazek. The water hazards on the course are interconnected and can rise and fall with the nearby Crystal River. Photo by Daniel Zelazek

away from slow-release fertilizers. I watch my grass clippings caught by the greens mowers and I apply light rates of soluble fertilizer as needed. Bermudagrass likes to be fed. The days of lean and mean are over. Consistent, pleasing and playable are my goals.”

This year has been a tester for everyone not just Oberlander. The wet, stormy summer gave way to a cooler, windy fall and with it comes a myriad turf management challenges and a constant learning experience.

“I thought this year we were going to have the smoothest overseeding ever. We got the seed out in two days according to plan and three days later it rained just right. Just as I settled back to watch the seed pop, the winds began to blow 15 to 20 mph every day.

“The seed started germinating, but it seemed only in a seven- to eight-foot band around the greens perimeters. The middles of the greens were very sparse

looking and I was beginning to panic. Finally, they began filling in, but it was weird.

“The only thing I can relate to the cause was the wind. I think the sandier USGA-spec mix under the greens was drying out too fast while the native soil near the edges had more moisture, making the germination rates different.”

Oberlander and his staff keeps tabs on the golf course by working a variable schedule consisting of 10 hours Monday, 8 hours Tuesday through Thursday and 6 hours Friday. Each employee works a rotating weekend shift every third week.

Oberlander supervises one of the weekend crews, but generally stops in every weekend to check the course and irrigation set up to monitor changing weather conditions. He classifies himself as a “working superintendent” and will often be the service or set-up man to see the course from a different perspective than just riding through.

With a staff of 16 people when he’s at full complement, Oberlander has to stretch the manpower to take care of the whole project. Four of his 16 crew members have the hotel, condos, villas and golf course landscape beds as their first priority. Sometimes for special events or if he’s short-handed he has to steal them to prepare the golf course first.

Besides his commitment to the Plantation Inn, Oberlander has dedicated himself to serving his profession through extensive service to his professional associations. He is a past board member and president of the West Coast GCSA and he was a founder and the first president of the Seven Rivers GCSA, which split off from the West Coast group.

Oberlander has also served for seven years as the chairman of the highly successful Envirotron Classic fundraiser for turf research held annually at the World Woods Golf Club.

Oberlander credits his success to his

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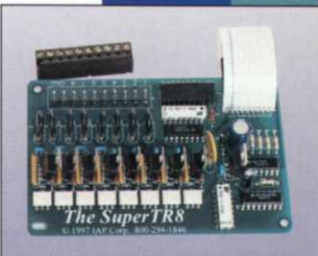
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Number 11 green Championsip Course in the foreground. In the background, parallel holes dominate the parkland layout that winds through many of the trees planted by Oberlander himself. Photo by Daniel Zelazek.

early involvement in the associations.

“In this business you never stop learning. Attending meetings and being involved in what’s going on is one of the best educations a superintendent can get.”

“The business has changed a lot over the years. I think golf course superintendents overall are getting more respect, but the stricter regulations and higher expectations are burning people out faster. I really feel sorry for the younger superintendents these days. I think they are under a lot of pressure with so many people looking over their shoulders.”

Nurtured by his love for golf and the desire to create and be part of a harmonious working environment, Oberlander says hopefully one day down the road he might like to own his own golf course. At 44 years old, Oberlander has plenty of time to pursue that dream. Meanwhile, he’s enjoying working and living on Florida’s Nature Coast.

Seven Rivers Chapter

History: The Seven Rivers Chapter was formed in 1991 to provide travel relief for West Coast members who lived well north of the Tampa-St. Petersburg area. Named for the seven rivers flowing in Citrus County, the chapter serves superintendents from the Gainesville-Ocala-Brooksville area.

New Approach: In trying to avoid some of the problems of big chapters, the Seven Rivers GCSA took a different approach to membership. They established a 3:1 superintendent to vendor membership ratio. Vendor memberships are by company, not individuals, and the companies must be members of the Florida Turfgrass Association. Only one person from the company may attend meetings, except for a couple of special meetings during the year. The companies are charged a higher dues rate, but they are not asked for any other support the rest of the year. Beverages and refreshments are paid by the chapter from the funds of all supporting vendors. It must work. There is a waiting list to join.

Founding members: Jeff Hayden, Glenn Oberlander, Tim Sever, Dave Hoggard and Stuart Bozeman were among the first to meet and discuss forming the new chapter. Legend has it that Glenn was called from the room for a phone call and while he was away, the others voted him in as the first president. Glenn swears it was a set up.

Activities: The Seven Rivers Chapter has distinguished itself for all time by the organization and operating of the annual Envirotron Classic each April at the World Woods of Golf Pine Barrens and Rolling Oaks courses. With the generous support of the World Woods ownership, which donates the use of the courses, the Seven Rivers GCSA has been able to raise nearly \$272,000 for equipment and research at the University of Florida. Glenn Oberlander has been the chairman and chief whip for the event all seven years.

Officers for 1999-2000: Paul Illgen, World Woods of Golf, president; Bob Marrino, Magnolia Valley GC, vice president; Buddy Keene, Gainesville CC, external vice president and secretary; Stuart Bozeman, Seven Rivers G&CC, treasurer. There are currently 112 members of the Seven Rivers GCSA.

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What Have You Done for Me Lately?

BY DAVID COURT, CGCS

FGCSA Membership Chairman

What have you done for me lately? This is a question asked by many people in a variety of situations. Maybe it's Steve Spurrier or Jimmy Johnson saying it to their quarterbacks. Closer to home it could be a green chairman asking his golf course superintendent. It really hits hard when a superintendent asks this of his local chapter or

state association, "What am I getting from the FGCSA for my \$70?"

Publications

First in publications you get the best magazine in the country produced by superintendents for superintendents, *The Florida Green*. 3,000 copies of the magazine are circulated to members, green chairmen, club managers, golf course builders, architects, turf researchers and other VIPs in the golf industry.

The FGCSA newsletter, *The Green Sheet*, is produced bimonthly and is a fact-filled publication that keeps members up to date with a calendar of upcoming events, highlights of FGCSA board meetings, legislative issues, public and media relations and educational opportunities.

The *FGCSA Membership Directory* is published annually and is sent out to all members throughout the state. It even has a nice cross reference in the back to let you locate another member by course and chapter.

Staff

Our state association has two of the

best staff members that an association could have. Marie Roberts, our association manager, is always there to help out. If you are looking for information about a job change, she has that information for members only. She assists the board members and committee chairmen carry out their duties. A 15-year FGCSA employee, Marie keeps the association's books and financial records, works as advertising manager for the *Florida Green*, puts together the *Green Sheet* and publishes the Membership Directory.

Joel Jackson, our director of communications, stays busy as the editor of *The Florida Green* magazine and *Green Sheet* newsletter. He also represents the FGCSA members at meetings of allied associations, government relations and public relations.

Joel has been selected to the board of directors of the Agriculture Institute of Florida and the advisory board of the Florida Golf Course Owners Association

He is also a member of the media-based International Network of Golf. It's easy to spot Joel at a function. He's the guy with the camera and tape recorder.

Education

The FGCSA partners with local chapters to host several GCSAA Regional Seminars throughout the year. These seminars can be taken by superintendents, assistants or other key staff members. CEUs are always available toward certification at these seminars. This is a great way to keep up with your continuing education for your current and future positions.

The FGCSA hosts additional credit-earning GCSAA/Etonic Leadership seminars at the Poa Annuia Classic each May in Naples and at the annual Florida Turfgrass Association Conference and Show along with practical concurrent education sessions.

The FGCSA also partners with industry representatives to put on a series of pesticide safety seminars around the state to provide opportunities for superintendents and pest control technicians to earn CEUs toward renewal of restricted pesticide licenses.

Turf Research

The FGCSA is well known for fund raising and research support not only in Florida but also nationally. Much of the effort can be recognized by the work done on the Otto Schmeisser Research Green at the University of Florida's Ft. Lauderdale Research and Education Center.

The FGCSA has also supported the development of the G.C. Horn Turf Research Center and the Envirotron Turfgrass Research Laboratory located in Gainesville.

The FGCSA is a charter member of the GCSAA Platinum Tee Club (\$5,000/year) and pledged an additional \$25,000 to the GCSAA's "Investing in the Beauty of Golf" campaign which supports practical, on-course turf research projects.

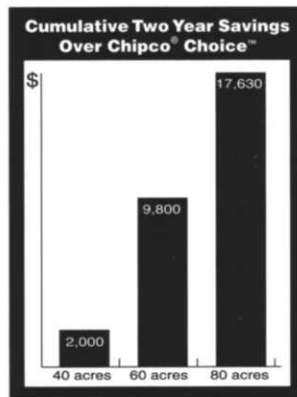
An FGCSA member serves as co-chairman on the FTGA Awards committee to help select worthwhile turf-related projects for funding and the FGCSA and its local chapters annually donate funds from special events to the FTGA to be designated for golf turf research.

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Welcome to the Microbial World



The role of this dynamic community in turfgrass management has raised a variety of opinions, questions, and products.

BY MATT NELSON

USGA Agronomist, Northeast Region

The soil microbial community consists of a wide array of organisms with numerous and many yet-to-be-understood complex interactions (14). Although studies of soil microbiology have been conducted for decades, scientists have recently made considerable progress in furthering our understanding of microorganisms and their function in soils supporting turfgrass growth.

Public outcry and opposition to the use of synthetic fertilizers and pesticides have prompted much of the recent research.

While very useful findings have been obtained through many painstaking and novel research strategies, these studies have yielded the realization that considerably more research will be necessary to develop solid recommendations for managing soil microbial populations. This article will review soil microbiology and discuss how to select and investigate the use of various products and management techniques. The intent is to pro-

vide information for golf course superintendents and other turfgrass managers so they can objectively evaluate the plethora of products that claim to produce better turf by influencing soil microorganisms.

Soil Microbiology

A productive, biologically active soil can contain as many as 45 quadrillion microorganisms in the rootzone of 1,000 square feet of turfgrass (19). This population consists primarily of bacteria, actinomycetes, fungi, and algae. Within each of these groups of organisms are many diverse genera and species whose populations fluctuate widely both spatially and temporally. Among the factors contributing to this variation are energy sources, nutrients, water availability, temperature, pH, atmosphere, and the genetics of the organism (6).

The result is a very complex and highly competitive system influenced by a combination of biotic and abiotic forces. The specific function and characteristics of the constituents of the microbial community are not straightforward and are

not thoroughly understood.

Fungi are involved in organic matter decomposition, mycorrhizal associations, and turfgrass diseases. Mycorrhizal associations are known to improve nutrient and water uptake, and also stabilize soil aggregates. In fact, mycorrhizal associations have been shown to provide interspecific transfer of phosphorus and other nutrients (3).

Endophytic fungi form associations with plants and discourage insect predation. Actinomycetes decompose organic matter, particularly complex organic molecules such as cellulose and chitin. Actinomycetes are also capable of producing antibiotics that may confer disease suppressive qualities (15, 22).

The bacterial populations in soils contribute a range of benefits to plant growth. Included in these are nutrient cycling, soil aggregation, solubilization of immobile elements, competition with pathogenic organisms, organic matter decomposition, and the production of phytohormones.

Bacterial populations and their associative functions are diverse and highly significant to plant productivity. Bacteria tend to utilize simple organic compounds such as plant exudates, while fungi and actinomycetes are more proficient users of complex organic compounds (6).

Much of the activity described above occurs in the region of the soil environment influenced by roots, known as the rhizosphere. Within this region from the root surface outward approximately 10mm is found enhanced nutrient cycling, exudates that affect pH, redox potential, and nutrient availability; symbiotic associations with soil microbes; colonization by microorganisms; interactions with roots and pathogens; and metal mobility and complexation. More simply put, this region is the dynamic interface between plants and soil where microbial function is in action.

Grasses have a significant amount of rhizosphere due to their fibrous and extensive root systems. Although our understanding of the organisms, processes, and dynamics is increasing, there has been relatively little discovered that

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would enable turf managers to exploit the rhizosphere for improved turfgrass health. Researchers have, however, used mineral nutrition to affect rhizosphere pH and control root-infecting pathogens (4, 23). Beyond this, there is a host of unsubstantiated product claims that purport to favorably affect rhizosphere processes. In turfgrass systems, there is a significant lack of research to validate these claims, not the least of which include the lack of repeated studies and findings at diverse sites or across a variety of soil systems.

Most soils supporting turfgrass growth contain a very active and diverse microbial population. Some people have alleged that the use of synthetic fertilizers and pesticides reduces or eliminates the microbial community by altering the pH of the soil or causing direct and indirect toxicity to organisms. Except for the presence of inert ingredients in some emulsifiable concentrate formulations that have caused toxicity, preliminary results from one ongoing study indicate that pesticides do not adversely affect most non-target microorganisms (16). Due to the high productivity and rapid turnover of turfgrass roots, as well as the high lignin content in the stems and leaves, organic matter and microbial habitat are rarely deficient in turf grass systems (12).

The one system that may limit microbial activity due to a lack of favorable habitat is a newly constructed high-sand-content root zone, likely due to reduced nutrient and water-holding capacity. Keep in mind, however, that the advent of the sand rootzone system and sand top dressing arose to address severe agronomic difficulties, namely soil compaction and poor drainage of native soil greens. Sand-based rootzones have created physical characteristics that allow golf course superintendents to provide superior playing conditions and also maintain an oxygenated root zone. Microbial populations generally will stabilize 3-5 years after establishment, so amendments to the sand that can facilitate a more rapid colonization of the rhizosphere should lend stability to the system (6). These amendments would

include various organic types, including composts and/or inorganic amendments. The challenge of establishing turfgrass on new, sand-based rootzones could be due in part to the lack of sufficient microbial activity to buffer the system from environmental extremes and harmful pathogens

Soil Management and Microbial Enhancement

Testing for Soil Microbes

Undisputed is the important role microorganisms play in plant and soil health. The difficulty is in quantifying and qualifying that role. Recent advances in molecular testing capabilities have enabled fairly accurate quantification of the microbial component in soils. While this will not yield a clear understanding of the diverse function and interaction of the various organisms, it is a beginning point for assessing microbial health in soils. Keep in mind that microbial populations fluctuate widely across sites and over the course of a season, however, so testing for microbial activity may produce somewhat confusing results until a large-enough database can be assimilated. This currently may not be feasible or cost effective, and it will certainly take time. However, microbial testing may provide comparisons of soil that supports healthy turf versus soil struggling to support turf. Be sure to account for other factors that may be limiting growth, such as sunlight, air circulation, drain-

age, fertility, traffic flow, etc. (13). Soil testing for microbes may help assess whether microbial activity is influencing turfgrass quality.

Biostimulants

Biostimulant is a loose term that includes microbial inoculum, energy sources for microbes, soil conditioners, plant hormones, and other non-nutritional growth-promoting substances. In recent years, products containing both biostimulants and fertilizers have further muddled this definition. This makes differentiating between fertilizer response and biostimulant response difficult, if not impossible. No doubt this is precisely what the manufacturers of such products have intended, since the non-nutritional component alone may not elicit a plant response.

One group of biostimulants is plant hormones. These products may contain one or more of the following: cytokinins, gibberellins, auxins, abscisic acid, and ethylene. When growing under normal conditions, plants have adequate levels of hormones for normal growth and development. Most physiological processes in plants involve an interaction of several hormones, and individual hormones have several functions. Further, many hormones have different functions in different plant species (8). Normal hormone production can be influenced by environmental and cultural stress. Different species of plants, growing in different environments, with different

Soil Microbes

Bacteria: Single-celled organisms without a nucleus. Perform an important role in organic matter decomposition, nutrient cycling, soil aggregation, competition with pathogens, production of phytohormones. Also form symbiotic associations with plants.

Actinomycetes: Filamentous bacteria. Decompose complex organic matter molecules like chitin and cellulose, produce antibiotics, and regulate bacterial populations.

Fungi: Very good degraders of organic matter. Mycorrhizal and endophytic fungi form beneficial associations with plants. Most turfgrass pathogens are fungi.

Algae: Autotrophic organisms. Some fix nitrogen. Excess nutrients can result in an unwanted bloom.

Protozoa: Important in nutrient cycling and organic matter decomposition. Feed on bacteria and control bacterial populations.



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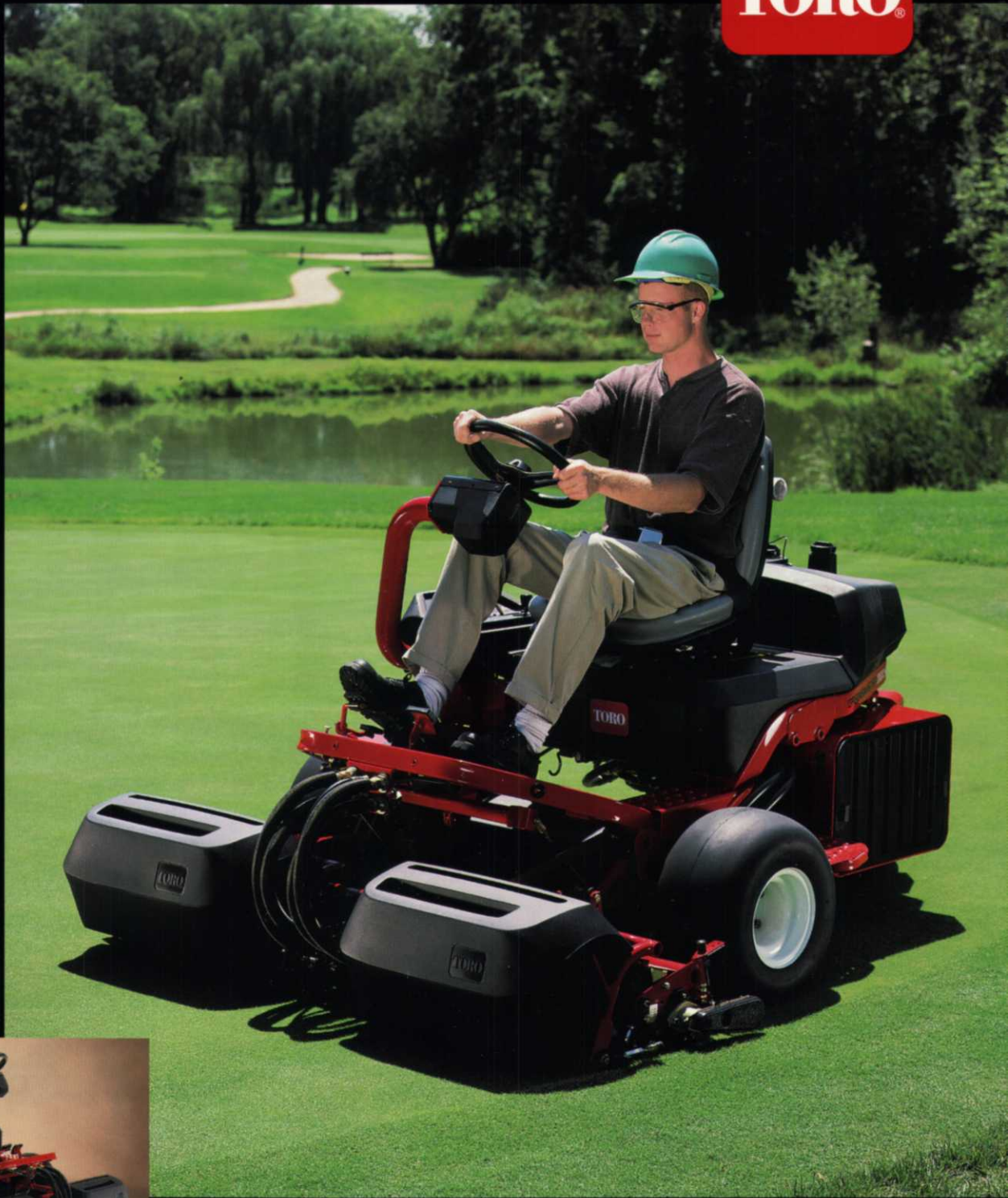
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POWER Large 21 hp Daihatsu 3-cylinder, liquid-cooled diesel for years of dependable service. The heavy-duty design features an industrial radiator with widely spaced fins to resist plugging.



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VERSATILITY There has never been a greensmower with as much versatility as the new Greensmaster 3250-D. A large 21 hp Daihatsu diesel engine provides the performance needed for use on greens and all areas around greens. Available **3WD option** further increases productivity and versatility by eliminating slippage when working around elevated greens and tees, especially on dewy turf early in the morning.

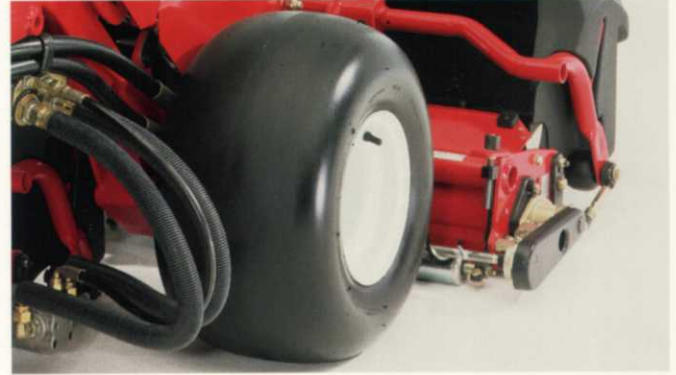


ENVIRONMENT FRIENDLY The unique engine design allows for higher torque at lower RPM's, meaning noise and vibration are kept to an absolute minimum. Plus the 3250-D is biodegradable oil ready. An optional Turf Guardian® leak detection system is available.

INNOVATION



QUALITY OF CUT A newly-designed suspension system increases cutting performance, allows for mowing with or without baskets, and facilitates easy removal of center cutting unit. Redesigned cutting units reduce turf marking, improve grass throw in heavy conditions and are easier to service. And a new basket design results in improved grass collection and clean after-cut appearance.



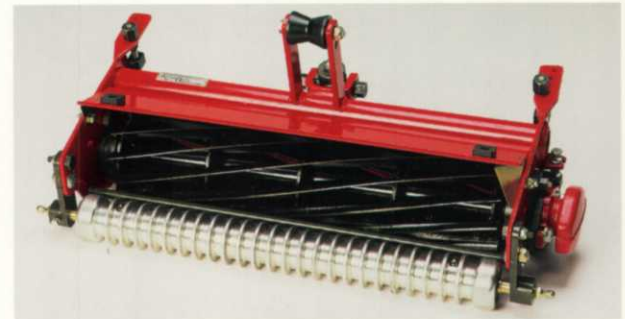
LIGHTER FOOTPRINT A significant breakthrough in greensmower tire technology means the Greensmaster 3250-D tires are gentler on the turf than any other greensmower tire. Large 19 x 10.5-8 tires feature a new, more flexible sidewall design for compaction relief on greens and less scuffing in turnaround areas.

ACCESSORIES

Toro offers an impressive selection of accessories to further increase the productivity of the Greensmaster 3250-D.



THATCHING REEL Variable blade spacing lets you customize your mower to each specific need. Spiral pattern blades effectively remove thatch.



GROOMING REEL Promotes upright, denser turf by helping control thatch build-up.



GREENS SPIKER Spiking reel penetrates the turf surface for aeration and leaves sizable holes for preparation of topdressing.



GREENS TRI-ROLLER Roller effectively smoothes playing surface for faster ball roll when desired.

GREENSMASTER® 3250-D



GREENSMASTER 3250-D

Engine	Briggs and Stratton/Daihatsu 850D 3-cylinder liquid-cooled diesel engine, 51.9 cu. in. (850 cc) displacement. Full-pressure lubrication, oil filter. 21.0 hp (15.7 kW) at 3600 rpm, 14.5 hp (12.3 kW) at 2600 rpm. Engine governed to 2750 rpm high idle, 1500 rpm low idle (no load).		
Fuel Capacity	6 gallons (22.7 liters)		
Traction Drive	Hydrostatic piston pump, closed loop system. Foot pedal forward and reverse; infinitely variable. Two front-wheel orbit motors, 10.3 cu. in./rev. displacement.		
Ground Speed	Forward-mowing speed is variable from 2 to 5 mph (3.2 to 8 km/h), adjusted by stop on pedal mechanism. Mow speed setting does not affect transport speed. Maximum Greensmaster 3250-D transport speed is 8.8 mph (14.1 km/h), may be reduced by adjusting stop in footrest pan without affecting mow speeds. Reverse is 2.5 mph (4.0 km/h) maximum.		
Turf Compaction	10 psi (.68 bar) average at recommended minimum tire pressures, with a 200 lb. (91 kg) operator, and cutting units down.		
Steering	Power steering. Open center, non-load reacting steering valve with power beyond for raise/lower circuit and hydrostat charge circuit. 13.0" (33 cm) round steering wheel. No-tool quick adjust steering arm position, with arm motion allowing a wide range of operator sizes. Steering cylinder has 1.50" bore x 6.25" stroke with through-shaft design for accurate straight line steering.		
Controls/Gauges	Raise/lower-mow lever. Functional control lever (neutral, mow, transport). Foot operated traction drive and brakes. Hour meter and 4 bulb warning cluster. Hand operated throttle. Mechanical engine speed control. Water-in-fuel warning light.		
Electrical Features	Maintenance-free 12 volt battery with 530 minimum cold cranking amps at 0 degrees F. and 85 minutes minimum reserve capacity at 85 degrees F. 40 amp alternator, circuit fused at 40 amps. Ignition switch/key. Seat switch. High temperature engine kill override switch. Harness terminals, fuse slot, and console switch location available for optional lights installation.		
Sound Level	GR3250-D Reels Off Reels On	Operator Ear 83 dBA 84 dBA	At 25' 73 dBA At 75' 62 dBA
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Tires	Three 19 x 10.5-8, 2-ply pneumatic tubeless demountable and interchangeable. Smooth tread. 8" (20.3 cm) rim for high tire flexing.		
Tire Pressure Recommended	8-12 psi front 8-15 psi rear		
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stresses, at different times of the year are quite likely to react in different ways. One of these different reactions will undoubtedly be with hormone regulation, and this is consistent with the variability in plant response to hormone applications in research results and field trials across the country. There currently is no evidence to suggest that applications of plant hormones will yield favorable or consistent results with respect to improved plant health. Furthermore, adding hormones to plants beyond normal levels may produce an inhibitory or undesirable effect. Without research information to identify and quantify treatment regimes, it may be wise to avoid tampering with plant hormonal activity (7). Anecdotal evidence and testimonials have been the substitute for independent research results repeated at multiple locations.

Another type of growth stimulant available on the market contains humate or humic acid. These are naturally occurring organic compounds that are the end products of biological decomposition. Accordingly, they are extremely resistant to further decomposition. Products containing humates claim to increase cation exchange capacity, increase microbial activity, and chelate micronutrients. Kussow reviewed manufacturer recommendations for amending a sand-peat root zone mix with humate and found it to be a very expensive means of increasing the CEC by 13% (9). His re-

view further concluded that iron, copper, manganese, and zinc are rarely deficient in turfgrass soils, thus enhancing micronutrient availability may only provide negligible benefits. Another study clearly demonstrated that since humates are the end result of decomposition and thus resistant to further breakdown, they do not stimulate increased microbial activity (25). Yet another study reviewed

the effects of six non-traditional growth-promoting products on the establishment of creeping bentgrass in high-sand-content rootzones. Only one of the products produced significant differences from the control, and the product contained humate. Upon chemical nutrient analysis of the product, however, it was discovered to contain 6% N, 5% P, 2% K, 4% S, and 4% Fe. Using this product at

Evaluating Independent Research

- Who (principal investigator) did the research?
- Where was the work done (lab or field, sand or soil)?
- Look for replication, good comparative treatments, and statistically significant differences.
- Have the results been duplicated at another site by another independent researcher?
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the recommended application rate was equivalent to applying an additional 0.75 pound N, 1.3 pounds of P, and 0.34 pound of K per 1,000 square feet per month (7). It may well be that this response could have been duplicated with conventional fertilizer, and it would seem to request an independent nutrient analysis of any growth stimulating products you intend to try.

Finally, there have been studies that indicate humates and humic acids can reduce the efficacy of pesticides by reducing their absorption by plants and pathogens (9). It is also reported that the fulvic acid component of humates can actually increase the solubility of pesticides and possibly increase mobility (28). Most of the studies that claim any benefit from adding humates were in either nutrient culture or sand culture systems, not in field situations. The variation in humic substances from different sources and lack of research that supports their use on turfgrasses currently do not justify

their use in turf management.

Carbohydrate fertilizers, another biostimulant, have not been proven to improve turfgrass stress tolerance or have any lasting impact on soil microbial populations. Again, research on turfgrass and carbohydrate application is lacking, but observations across the country indicate no observable benefits. Any stimulation of microbial activity is likely to be very short-lived.

Microbial Inoculants

Various microbial inoculants have been formulated for use on turfgrass, with claims of accelerated organic matter decomposition, improved nutrient use efficiency and availability, soil conditioning, disease control, mycorrhizal associations, and others. The success of these inoculants has been limited for a number of reasons. At this point, you should be aware that the microbial community is a very diverse and complex set of organisms. The degree of natural com-

petition, antagonism and predation limits the successful establishment of introduced species. Persistence of applied organisms is further hindered by the continual temporal and spatial fluctuation of microorganism populations (6). Formulation and delivery of the organisms present even more problems for microbial inoculation (15). If the organisms can be kept alive until application, many are sensitive to UV light and must be applied frequently (in some cases nightly) to establish sufficient populations. Although there have been efforts to apply microorganisms through irrigation systems, the results remain largely inconsistent (2). Finally, some companies will not even list what organisms they have formulated, because they are proprietary. Without knowing what is being applied, it is impossible to gauge the potential benefits. These organisms could be detrimental to your turf by actually competing with the beneficial organisms already present in your soil (7).

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Composts

With little doubt, the most promising method of managing and enhancing the activity of soil microbes is with composted organic matter in wastes and other materials. Ironically, this is also one of the oldest agricultural practices. Composts have been shown to add an active microbial component to soils and to stimulate those microbes already present in the soil (14). Well decomposed organic matter provides excellent habitat and energy sources for soil microbes, and will provide more permanent benefit than inoculation with microorganisms. Composts will effectively enhance soil aggregation, provide nutrients, reduce compaction, and improve soil porosity. Sandy soils amended with compost will exhibit greater nutrient- and water-holding capacity (10). While limited evidence exists, there is some data to suggest amending sand-based rootzones with compost can offer improved establishment and disease control over commonly used peat amendments (5, 14).

The use of composts in turfgrass management presents a viable means of recycling municipal and industrial wastes while improving turfgrass quality. Composts can vary considerably, however, depending on their source. Commonly used composts include brewery sludge,

yard wastes, poultry litter, animal manure, municipal wastes, and food wastes. It is recommended to have composts tested for organic matter content, ash content (especially if used as a topdressing), moisture content, pH, nutrients metals, and soluble salts (10). On-site composting operations should follow guidelines to ensure that the material has been properly and sufficiently

composted (14, 20, 28). The disease-suppressive characteristics of composts will be discussed in the next section.

Biological Pest Control

In recent years, considerable focus has been placed on the biological suppression or control of various turfgrass pests, including diseases, insects, and weeds. Reducing the pesticide load on

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On-Site Testing Protocol

- Test products at several locations representing different conditions on the golf course.
- Use controls (no product) to establish comparisons.
- At least two years of field data are necessary to obtain an accurate assessment.
- Rate the plots monthly to track differences (color, disease, stress tolerance, rooting, etc.).
- Conduct an independent nutrient analysis of new products. You may be seeing a fertilizer response!
- Be honest! Is it the product or favorable weather, better cultivation, an improved growing environment, or other changes in management strategies?



the environment is the primary impetus behind such study. While research has proven effective pest control with various biological entities in the laboratory, few have proven consistently effective in field studies.

Biological control operates on five basic interactions with the turfgrass-soil community: competition, antagonism, predation, parasitism, and pathogenicity (1). The two ways of exploiting these interactions include microbial inoculants and organic amendments. While dozens of organisms with potential as inoculants for disease control have been studied (17, 18, 24) few have demonstrated any efficacy in the field, and only one product (Biotrek 22G, (*Trichoderma harzianum*) has been registered for disease control on turf (11, 15). Biological control of insects has been somewhat successful in recent years with such organisms as entomogenous nematodes, soil bacteria and fungi although registered products are still limited (21, 26).

Serious shortcomings exist in the understanding of the pest control mechanisms themselves, relationships with other organisms in the community, and formulation and delivery technology. Furthermore, foliar disease control with inoculants is limited due to UV sensitivity of the organisms and wide fluctuations of environmental parameters in the turfgrass canopy.

The difficulty in delivering organisms to the roots has preempted much success in controlling root diseases. Because successful pest control typically depends on the establishment of high population levels, frequent (and arguably unsustainable) applications become necessary. Injecting organisms through irrigation systems has yet to be proven as an effective method of uniform and consistent microorganism application

Keep in mind that 1) population interactions within the soil are dynamic and interrelated, 2) introduced organisms are slow to colonize habitat and

generally fail to persist, and 3) it is unclear whether the introduction of microbes in the environment will produce a lasting change and if the introduction will be beneficial in the long run (1, 15).

Organic soil amendments and additives, particularly compost, have perhaps a greater potential for effective biological control of diseases than do inoculants. Well-composted material (2-3 years) often exhibits disease-suppressive characteristics (14).

Studies at Cornell University have demonstrated significant and lasting disease suppression of *Pythium* root rot, dollar spot, and snow mold when composts were used as amendments or topdressing (14).

Continued research in this area to reveal the microbiological mysteries should help develop more reliable and predictable composts for disease suppression and soil conditioning. As alluded to earlier, proper composting techniques and laboratory testing coupled



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with on-site testing will reveal what to expect from composts.

New Products

Never before has the turfgrass industry had as many commercially available products for use. Financial responsibility and sound management dictate that product purchasing decisions are of extreme importance. So how does one choose between the good, the bad, and the ugly?

The first place to start is with the product label. There are products that have been registered with the EPA and can legally justify the claims of the product. These are products that contain active ingredients (29). There are unregistered products marketed for various uses, some of which are supported by inde-

pendent research. Then there are products marketed for various uses without supportive research. These products use testimonials and fancy marketing to make a sale, and often can be classified as snake oils.

Let's be sure we understand the independent, scientific research that supports product use. Be sure you know who conducted the research, where, under what conditions, and the relevancy to turfgrass systems. Also, look for replication in the study, good comparative treatments, and least significant differences. Check closely to see that the results have been duplicated at another site by another independent researcher, and that results have been published in a refereed journal. Make no mistake, slick brochures and displays can be confusing!

One product advertisement I recently reviewed claimed the product would cause no grow-in layer, extend the useful life of greens, reduce grow-in time, eliminate the possibility of nitrite (yes, they said nitrite, not nitrate!) and phosphate leaching, and reduce labor, among other things. This company may need legal counsel as much as scientific counsel. Finally, call the researchers and ask technical representatives what the active ingredients are and what are their modes of action (29). University extension personnel and USGA agronomists can also provide valuable information.

If a product you are interested in passes this initial screening, it is strongly recommended to conduct on site testing at your golf course. Many of these products are not cheap, and good manage-

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ment involves an economic analysis. Test the material at several locations on the golf course representative of different conditions, replicate (meaning include repeated treatments at each site), and use untreated controls and other treatments in side-by-side comparisons. All too often, new products are tried all over the golf course without a control; thus, it is impossible to determine what effect, if any, the new product has. Perceived benefits could be a result of favorable weather or other management techniques (7, 13). Take consistent, monthly ratings of the plots for color, disease, and rooting depth and mass, and note stress tolerance differences. Good tests require at least two years of field data. Because a product will cause no harm is not reason to use it, and such a decision is representative of poor management.

Conclusion

Turfgrass management is a continually evolving science, and as our under-

standing of the microbial community in turfgrass systems improves, new products will routinely hit the market. Some of these products will be useful, and many others will not. Independent research will be essential to the development of effective products. Perhaps companies marketing biological products would be wiser to fund some research than to purchase full page ads in popular trade magazines (if they have faith in their products)!

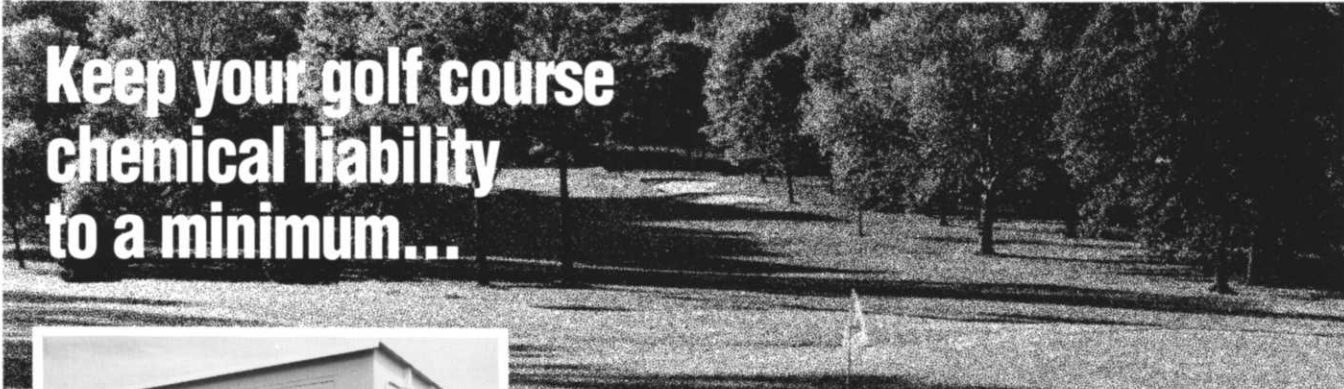
If completely organic management is ever realized, it will certainly be through a gradual phase-out of synthetic products. Along with the advent of biological products, golf course superintendents must also keep themselves apprised of advances in synthetic chemistry. Many new products have been developed from synthesized organic compounds that are effective at very low levels of active ingredients, have low water solubility, short half lives, and a strong binding potential with soil and organic matter. The new synthetic chemistries are better for the

environment than many of the older chemistries.

The importance of a strong microbial community cannot be questioned. The effectiveness of various products available to stimulate microbial activity can be questioned. Become familiar with soil microbiology and processes, check for duplicated independent research to support product claims, and test the material yourself to be sure it is effective and makes good economic sense. But whatever you do, don't forget the basic tenets of successful turfgrass agronomy: adequate sunlight, drainage, air circulation, proper fertility, good water management, traffic control, and cultivation.

*CREDIT: USGA GREEN SECTION RECORD,
JULY-AUGUST 1998*

MATT NELSON is an agronomist in the Northeast Region of the USGA Green Section. He "bugs" superintendents to take a close look at product purchasing.



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Just like many of you, I have anecdotal experience that would suggest that this product or that product did indeed produce some sort of positive results. The challenge comes in finding reams of peer-reviewed scientific studies that give us a better idea of what's going on and how predictable a product or its results might be. We may soon find ourselves on a path that separates the snake oil from salvation.

Synthetic chemicals and fertilizers are under constant attack these days. They have been quick, effective tools to solve turf problems for about 50 years. Now the politically correct and environmentally conscious activists are waging a holy war to eliminate as many pesticides and fertilizers whether or not they are truly harmful. We can fight back, but it is a constant battle and the end users are at the mercy of too many things they can't control like the media, and politics and the manufacturers' bottom lines.

So, what if we could find more natural, benign ways of producing strong, healthy turf in a very active, healthy, growing medium? Maybe we can reduce our dependence on synthetic products, which are likely to start disappearing anyhow. Maybe we can find less expensive ways to enhance the natural systems at work and eventually produce stronger, healthier playing surfaces. The following articles provide information, insight, caution and hope for microbial solutions, and we are poised to start funding more research on these millennium bugs.

Former Sales Rep is Sold on the Products, Not the Sales Pitch

Since I tried to sell this technology to most of you for two years, I felt obligated to respond to this Hands On topic, "Microbes – The Real Millennium Bugs." I'm not going to waste my time or yours continuing to sell you on this concept. By now you either believe that using microbial products is good science or you think it is a deception.

Now as a superintendent once again, I use the Green Releaf products that I sold, but not exactly in the way I sold them. I tried to sell programs that incorporated small amounts of all the products that Green Releaf sold on a 7- to 14-

day schedule. Green Releaf trained us to sell the products that way, because if you bought into the program you would not have room to use other people's products. The program I use incorporates several different brands of products.

I basically spray my greens every week with a mixture of nutrients. I determine which nutrients to use and the amount of nutrient needed by tissue sampling. In that mixture I incorporate two gallons of Green Releaf 5-10-5 plasma per acre. I use the plasma because of the carbohydrates, amino acids, and humates that are in the product. The nutrients in the plasma are just a bonus.

The theory is that if you increase the amount of food source for the microbes in the soil, you will increase their population. The more microbes that are in the

soil the more efficient the plants will become.

I'm pretty sure that all the so-called biological products are based on this theory. In my mixture, I add one gallon of fulvic acid per acre to help hold the nutrients in the soil. My own personal theory is that by using plasma and fulvic acid, I can get by with using the lower-priced liquid nutrients and get the same results as if I used the high-priced ones.

When I was selling microbes for Green Releaf, most microbiologists were skeptical of the validity of the products. Every researcher I spoke with said that, in a laboratory setting, the microbes did all the wonderful things that Green Releaf claimed. However, only a few scientists felt the microbes could live long enough to get down into the root zone.

Even the most discriminating skeptics felt that if you could get the microbes into the root zone they would be notably beneficial. Because of this, I use the living microbes in two ways. I use them when I aerify, and I inject them with a hydroject.

When I aerify, I spray 5 gallons of Bio A and Bio B+ per acre after the cores are removed and before I topdress. I immediately flush the "bugs" into the soil with 10 to 15 minutes of irrigation. I then add 300 lb. per acre of Green Releaf 15-4-7 organic granular (to feed the microbes), then drag it into the holes with the topdressing.

What I see by doing this process is rapid recovery from the aerification, and a flush of root growth even in the summer months.

During the winter I inject microbes into the greens monthly. Last May going into the rainy season, the roots on my greens were 6 to 8 inches deep and dense (I'm not just blowing smoke, several people can attest to this). During the heaviest part of the rainy season the roots shrunk to 2 to 3 inches, but new root growth was always occurring.

So here is the question: Can I attribute the success that I have had to microbial products? I don't know! It could be the microbes and carbohydrates. Or it could be that the weather was good last year, or my water management was

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better this year, or my nutrient management is better than when I used granular fertilizers.

I honestly don't think there is any way to tell for sure if the microbes and carbohydrates have made a difference without conducting a lot of expensive research. However, I am not willing at this time to take the microbial products out of the program. Not until someone proves to me that using microbial products is not good science.

Do I think there should be money laid aside to research microbial products? Absolutely! In my opinion, with all the radical environmental groups trying to get us shut down, anything we can do that is environmentally responsible is worth researching.

MIKE HAMILTON, CGCS
Foxfire C. C., Naples

Editor's Note: At its fall board meeting the FGCSA agreed to submit a proposal from Dr. Monica Elliott on microbes to the GCSAA for research funding. The purpose of the project will be to determine if *Bacillus* microbes applied to bermudagrass putting greens do survive and establish on either the turf or in the soil. The project will also determine the effect of frequent, multiple applications on the *Bacillus* populations. The research will be conducted on a portion of the FGCSA's Otto Schmeisser Research Green at the University of Florida's Research and Education Center in Ft. Lauderdale

Microbes Play Varied Roles in All Facets of Human Existence

If champagne, a loaf of freshly baked bread and a fragrant cheese will figure prominently in your Year 2000 celebration, then you can thank your local microbe. Human beings are dependent on microbes for many foods such as yogurt, sauerkraut, sour cream, beer and other fermented drinks.

There is also a type of bacterium that lives in the human intestine that makes vitamin K, a factor needed to clot blood.

In addition we take advantage of bacteria for their ability to protect us from microbial invaders. Human beings have their own special bacteria that have adapted to life in a salty, ocean of sweat on our skin. These bacteria keep out pathogenic fungi and bacteria. We also have a host of bacteria living in our throats, noses, intestines and other areas of the body. These friendly bacteria are tremendously effective at keeping the disease-causing bacteria away from their homes, our bodies!

A diversity of bacteria that associate with plant roots serve the same purpose of holding pathogenic microbes at bay.

Biological control agents, such as bacteria and fungi, work through a variety of mechanisms. These mechanisms include the production of antibiotics and other inhibitors; simple competition for food, water and space; stimulation of the plant's own system of defenses; and an environment around the plant roots that encourages growth of beneficial microbes.

Beneficial bacteria and fungi can form a barrier against pathogen invasion of plant roots. Because turfgrass's roots are surrounded by a host of friendly bacteria, it is much more difficult for *Gaeumannomyces* (take all disease organism) to reach its intended target.

In laboratory testing, conclusive tests have shown that *Gaeumannomyces* is sensitive to substances produced by several different species of bacteria. When a diverse group of microbes exists in the soil in the plant root zone, many reciprocal benefits are derived from that relationship. When bacteria and fungi colonize the rhizosphere, they are fed a steady diet of plant sugars. The plants in turn benefit from colonization of non-pathogenic microbes.

What happens if friendly plant bacteria are not available to protect plants? Soil that has been treated with harsh chemicals may deplete soil of the beneficial bacteria and fungi. When fungi and bacteria are no longer available as a shield pathogenic microbes may then be able to invade plants.

Within the past 50 years, the public has been taught that the only good microbe is a dead microbe. Nothing could be further from the truth. Without beneficial microbes, our plants would die and our own existence would be in jeopardy. And yet we

continue to douse microbes with bactericides and fungicides in an effort to exterminate the pathogens, but in doing so many beneficial are also depleted in numbers.

Some helpful bacterial species include *Pseudomonas*, *Bacillus*, *Cellulomonas*, *Corynebacterium*, *Rhodococcus*, and other member of the *pseudomonads actinomycetes*. Some species of *Pseudomonas* help break down urea-based fertilizers enzymatically and convert urea to ammonia. Ammonia is then converted by nitrifying soil bacteria to nitrates, a form of nitrogen readily available for plant utilization

Certain species of *Bacillus* produce insect toxins as well as antibiotics that inhibit fungal growth. *Bacillus* is an extremely hardy microbe. These bacteria form endospores under adverse conditions, enabling the microbe to withstand drought, high heat and adverse pH conditions. *Cellulomonas* is extremely helpful in producing substances that break down dead plant material in the soil, thus helping remove thatch buildup. *Rhodococcus*, *Bacillus* and *Pseudomonas* are proven pesticide and herbicide degraders; therefore much of the excess biodegradable pesticides are devoured by microbes.

One important factor to remember is that just one bacterial type cannot do a job alone.

This is the reason why it is important to maintain a highly diverse population of microbes. What one bacterium can break down in the soil may not be an available food source for another microbe. As mentioned above, several different bacteria are needed in the first step of converting urea to ammonia. Without a team of urea-degrading organisms, the nitrifiers would be powerless to use urea-based fertilizers as a nutrient and thus produce nitrates for plants.

Without many different bacteria and fungi in the soil, a healthy environment cannot be maintained. In the decomposition of dead plants and animals, certain inorganic elements such as phosphates are released and made available for plant nutrition. Many different bacteria utilize common organic wastes and produce carbon dioxide and water.

Without microbial diversity, nutrient

cycling would be incomplete and the soil could be said to be "imbalanced." When nutrient/mineral imbalances occur, it leads the way for certain microbial populations to proliferate and dominate. If pathogenic species dominate an area, then sensitive plants are in danger of becoming infected and an epidemic ensues.

While only a relatively few microbes, both bacterial and fungal, cause disease in plants and animals, a single infestation of *Rhizoctonia* (brown patch) or *Gaeumannomyces* can devastate a green. When a fungus invades an area it is difficult and costly to eradicate. From a fungal point of view, all any fungus wants is a warm moist place to live with an ample supply of food close at hand. A golf course usually provides the precise conditions that not only allow certain fungi a free ride, but in a sense, invite them in to stay.

However, certain defenders of the turf can and will defend grasses and other plants from the insidious invaders. Over the past 20-30 years, the prevalent method of ridding a green of the fungal marauders was to add fungicides. In recent years, golf courses and farms have come under attack for their supposed contamination of the environment with major amounts of chemicals and fertilizers applied in an effort to grow lush green lawns and a food supply to feed the world respectively.

In response to new governmental restrictions on chemical use, some operators are trying the natural approach of building and maintaining organic golf courses. A recent innovative approach is to add small doses of nutrients and microbes simultaneously to the courses. The result is efficient use of the fertilizers with the added bonus of inoculation with a diverse bacterial population.

This method of microdosing is being implemented successfully by such golf course superintendents as Jon Snider (Texas Star GC, Dallas/Ft. Worth) and Nels Lindgren (Loch Lloyd, Kansas City).

Use of the microdosing technique allows a reduction in the amount of chemicals applied and also allows the elimination of certain growth regulators. The use of such microbially-based inoculants as SuperBio microorganisms, a diverse group of 30 different microorganisms, promotes

the growth of healthy grass and other vegetation. Microbial products are not meant to replace traditional uses of fungicides, but may allow fewer chemicals to be applied. When SuperBio microorganisms are applied several days after application of fungal control agents, the bacterial diversity in the treated area is restored. In preliminary tests, certain of the SuperBio bacteria are showing promise in retarding growth of selected fungi such as *Gaeumannomyces* (take all) and *Cylindrocladium* (damping off).

Traditionally, the scientific community has been slow to support the need for research in microbial diversity since much of academic bacterial research is performed on pure cultures made up of only one bacterial type.

The problem in this approach lies in the fact that bacteria and indeed all other organisms on earth rarely if ever exist in pure cultures. All creatures on earth need help from other organisms, whether they are microbes, animals, plants, scientists or golf course superintendents.

However, within the past 10 years, the scientific community has begun to view microbial diversity in a different light. More research is now being done on mixed cultures of microbes in their natural habitats. The time has come to work together, microbes and man, for a healthier, safer place to live, work and play in the new millennium.

DEBRAH A. BECK, PH.D.

Advanced Microbial Solutions, Inc.

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Debrah Beck, Ph.D., received her doctorate in microbiology from the University of North Texas and is employed by Advanced Microbial Solutions. For information about AMS products contact Chris Hayes at 940-686-5540, e-mail chayahes7@airmail.net.

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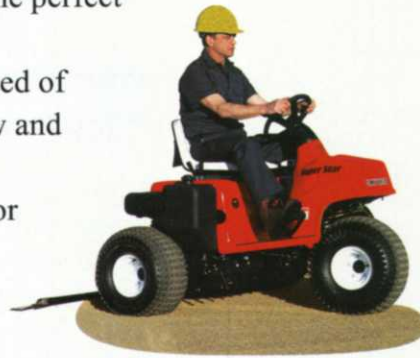


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TIDINGS FROM THE TC

Field Days Bring the Whole Turf Team Together

BY JOHN CISAR

University of Florida Turf Coordinator

ITEM: Turfgrass Field Day and South Florida Expo set for March 16 in Ft. Lauderdale. Overseed Field Day set for March 23 in Gainesville.

It's south Florida's turn to host the annual turf field day. This year the University of Florida Turfgrass Field Day will be held in conjunction with the South Florida Expo at the Ft. Lauderdale Research and Education Center.

The Field Day brings the entire turf team together. Presentations from state-wide faculty, field tours, equipment and supplier demonstrations, CEUs, and a great lunch will be featured. It's a great opportunity to see what is happening in turfgrass research in Florida and to meet the faculty of the University's turf team

The South Florida Expo is the major annual fundraising effort by the South Florida Golf Course Superintendents Association to support the Otto Schmeisser Research Green at the FLREC. Each year, the superintendents — with the generous support of vendors and suppliers — raise a large portion of the money needed to fund the technical support staff on the Green.

This year the event is headed by Jimmy Walker, SFGCSA president. Come on out to the Field Day and Expo on Thursday March 16, and show your support for the efforts of the University, the South Florida GCS Chapter and turfgrass industry.

For further information about registration, or for supplier and manufacturer booth sponsorship, contact Marie Roberts, FGCSA or me at (954) 475-8990.

Another event of great interest to superintendents is the Overseed Field Day. The event is scheduled for March 23 in Gainesville. Al Dudeck and the entire turf program do a terrific job in putting on the Overseed Field Day each year. The overseed Field Day includes research tours at the

2000 Florida Plants of the Year - Part 1

Editors Note: The Florida Plants of the Year program was launched in 1998 and has been beneficial to both consumers and growers. Purchasers are introduced to under-utilized but proven Florida plant material. The plants are chosen each year by a committee of horticulturists, nurserymen, educators, landscape architects and others representing Central, North and South Florida..

Common Name: White Geiger

Botanical Name: *Cordia boissieri*

Hardiness: Zones 9-11

Mature Height X Spread: 15 feet tall and 10 feet wide

Classification: Landscape tree or large shrub

Landscape Use: Specimen tree, small tree for street planting

Characteristics: White, papery flowers give their main display in spring but may form all through the warm months

Small evergreen tree that gets up to 15 feet tall in full sun and is hardy to cold weather in South Florida and blooms heavily in the early summer. It continues to bloom sporadically through the remainder of the growing season. *Cordia* makes an excellent street tree that is deciduous in Central Florida. The small tree is often seen grown as a large branching shrub.



Common Name: Silver Saw Palmetto

Botanical Name: *Sereoa repens* (silver form)

Hardiness: Zones 8-11

Mature Height X Spread: 6' tall x 6' wide

Classification: Landscape palm

Landscape Use: Mass planting, background

Characteristics: Silvery leaves are beautiful in their own right and provide a background for brighter colors

Slow growing clumps form multiple trunks with blue-green palmate leaves. Flower stalks produce black berries that are used as a cancer medicine. This Florida native is cold hardy in all parts of Florida and tolerant of salt.



Common Name: Pineapple Guava

Botanical Name: *Acca sellowiana* (formerly known as *Feijoa sellowiana*)

Hardiness: Zones 7-10

Mature Height X Spread: 8-12' tall and wide, can be kept lower with regular pruning.

Classification: Evergreen landscape shrub

Interior /Landscape Use: Background, hedge or specimen shrub for full sun to partial shade

Characteristics: Grey-green foliage is handsome all year

Acca is a large salt tolerant evergreen shrub with waxy edible petals in the spring, white on the outside and dark red inside with showy red stamens. *Acca* produces and edible grey-green, oblong (2-4 inches) guava-like fruit in some areas of Florida. it can be used as a hedge plant, foundation plant or specimen.



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Charles Young takes the helm at UF.

With the resignation of President John Lombardi, Charles Young, former longterm chancellor of UCLA, has stepped in as an interim president. Dr. Young comes to Florida with tremendous credentials for leading the university during the transition in leadership. We offer our gratitude for his many years of service to Dr. Lombardi and extend a warm welcome to Dr. Young.

Recently, Provost Elizabeth Capaldi, resigned and returned to the University faculty. Dr. Capaldi is perhaps most well known for developing the University of Florida Bank. The Bank accrued financial reserves obtained through improved efficiency in the University of Florida system. These funds were used for innovative project enhancements. These funds were

also used to provide 15 percent raises to exceptional University of Florida faculty. We wish Dr. Capaldi well in her new role.

Turf pros rewarded

I am very pleased to announce that three of our turf team faculty received special 15 percent pay increases mentioned in the previous item. Drs. Bryan Unruh, Grady Miller, and John Haydu were three out of a total of 15 IFAS faculty recognized for outstanding efforts. These scientists are all well-deserving and I am happy that turf faculty are getting this type of recognition.

Grants and project updates

I announced at the fall 1999 FGCSA board meeting that Florida turf did not receive any USGA grants this year for the first time in recent memory. We put in a lot of grant proposals but so did the rest of nation (well over 100) and with only 12 grants given out, our chances were slim even though the Florida proposals were excellent. We'll keep trying to increase the

odds in our favor by increased advocacy of UF proposals with the USGA.

I am aware of three proposals submitted to the GCSAA this year for Chapter Cooperative funding. I put in a proposal sponsored by the Palm Beach Chapter for support of the new ultradwarf management trial at the FLREC.

Dr. George Snyder and I also put in a proposal to investigate the role of gypsum to alleviate sodium effects on bermudagrass turf. This project was supported by the South Florida Chapter.

The FGCSA sponsored Dr. Monica Elliott's proposal to investigate the effect of added soil microbes in turf. Potentially, the GCSAA funding program could generate significant dollars for research in this state. We are very grateful to the Florida superintendents for their sponsorship of our projects. If we are successful this year, I envision even more of these types of partnerships in the future.

The ultradwarf management trial is underway at the FLREC. Three ultradwarfs



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are in the test: Champion, Flora Dwarf, and TiffEagle. In the first year, management practices such as verticutting, topdressing and N:K ratios will be addressed.

Milestones.

Many changes have come to our program. Dr. **Bob Dunn**, Extension nematologist, retired after many years with IFAS. We thank Bob and wish him and his family the best in retirement. Dr. **Cathy Neal**, multi-county turf Extension Agent in Central Florida, recently left Florida for a faculty position at the University of New Hampshire. We thank Cathy for all her efforts in Central Florida and wish her the best.

TAWG members, Dr. **George Agrios**, chair of Plant Pathology, and Dr. **Randy Brown**, chair of the Soil and Water Sciences Department, both announced their resignations as department chairs. We thank Drs. Agrios and Brown for their guidance and wish them well in their new roles. Drs. **Tito French**, Agronomy and **Alan Smjastrala**, Ag Engineering recently passed away. Both faculty made contributions to turf during their tenure at UF. We miss them and send our deepest regards to both Tito's and Alan's families.

Welcome aboard to Dr. **Carol Stiles**, turf plant pathology. Dr. Stiles is the newest member of our turf team. She has been on board since the new year. Candidates were interviewed for the soils position at the Everglades Research and Education Center in October 1999. The turf entomologist position closed in October 1999. There were 18 candidates for the position which will be housed at the FLREC.

FTGA UPDATE

FTGA Regional Seminar Series Debuts Jan. 11

The FTGA's Regional Seminar Series debuts in Lake Worth Jan. 11 and zig-zags to Ft. Myers, Tampa, Sanford, Jacksonville and ends up in Milton on Feb. 3. Nearly 2,000 members and their employees will participate in this educational effort. Restricted Pesticide User License CEUs and GCSAA untested PDUs will be available for those needing the credits.

FTGA Returns to UF Campus

The FTGA's Y2K Conference and Show will return to Gainesville on Aug. 14-17. The Conference and Show committees are busy planning the calendar of events and scheduling educational sessions and events to provide attendees with several options to maximize their conference experience and minimize time away from work. This year there will be an afternoon/evening Trade Show reception and grand opening on Tuesday, Aug. 15.

Now that remodeling and construction on the O'Connell Center is complete, all of the classrooms are being clustered in and around the O'Connell Center to eliminate long walks or drives to satellite classrooms like last year. This year it will be Park 'n' Learn.

The FGCSA plans to offer one GCSAA/Etonic Leadership seminar for CEU credit as well as special golf course presentations. There will also be IFAS workshops and concurrent sessions on turf research and general turf management topics.

Get Well Wishes

FTGA Office Manager Cheryl Stocklin is recuperating from a broken shoulder injury. She could use some cheer and support.

Send your get well wishes to Cheryl care of the FTGA Office at:

5850 T.G. Lee Blvd, Suite 110, Orlando, FL 32822-4408.

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FQPA, EPA & Food Safety: A different view:

Children's health may be *harmed* by restricting pesticides

BY KENNETH W. CHILTON, PH.D

Center for the Study of American Business

In the name of protecting families and children, the Environmental Protection Agency has entered into agreements with manufacturers to restrict the use of two pesticides — methyl parathion and azinphos methyl — widely applied to protect fruits and vegetables in the United States.

In announcing the agreement, Administrator Carol Browner said, "Our actions today will protect children from the adverse effects of exposure to pesticides commonly used on foods." She added, "I want to emphasize that for children and adults alike, the benefits of a diet that includes fruits and vegetables far outweigh the risks of pesticides."

How's that?

Administrator Browner's remarks beg the question: If the benefits of fruits and vegetables in our diets far outweigh the minute risks from trace amounts of pesticide residues, then why is EPA moving to restrict pesticides that are so vital to increasing their quantity and quality?

The answer is that the 1996 Food Quality Protection Act regulates risks from pesticide residues with no consideration of the beneficial role played by safe applications of pesticides. This response makes sense only inside the Beltway.

This tunnel vision approach, unfortunately, is quite typical of environmental law. But it is especially unfortunate in this case because in the name of children's health and in compliance with the FQPA, EPA is more likely to harm than to protect America's children.

A diet rich in fruit and vegetables is associated with reduced risk of degenerative diseases, including cancer, cardiovascular disease, and brain dysfunction. Bruce

Ames and Lois Swirsky Gold of the University of California at Berkeley report that the rate of most types of cancer is roughly twice as high in the 25 percent of the population with the lowest intake of fruits and vegetables as in the 25 percent with the highest.

And pesticides play an important role in producing high-quality, low-cost fruits and vegetables. Researchers at Texas A&M University estimate that a 50 percent reduction in pesticide use on crops of nine fruits and vegetables (apples, grapes, lettuce, onions, oranges, peaches, potatoes, sweet corn, and tomatoes) would reduce average yields by 37 percent.

Banning methyl parathion's use on a variety of fresh fruits and vegetables and reducing application rates and allowable residues for azinphos methyl on apples, pears and peaches will raise prices for the produce protected by these widely used effective compounds. Higher prices mean that fewer families will choose to purchase fresh produce. Children in low-income families will be impacted the most of all.

Who speaks for these children? Well, certainly not the environmental groups. The reaction by the Natural Resources Defense Council to the announced pesticide restrictions was that it plans to sue EPA for failing to move fast enough to restrict even more pesticides.

The Consumers Union and the Envi-

ronmental Working Group mounted a campaign this year to frighten the public about pesticide residues. The media blitz included a full-page advertisement in the New York Times. Their primary target was methyl parathion, the pesticide just banned by EPA.

But according to Carl Winter, director of the FoodSafe Program at the University of California at Davis, "When you use real data it's hard to make a strong case that pesticides are posing real health threats to infants and children."


Robert Golden, a toxicologist and former EPA employee was even more taken aback by the CU-EWG campaign. He warned, "People need to know that all the evidence just keeps pointing towards eating more fruits and vegetables. What Consumers Union has done, this is dangerous stuff."

The environmental groups that engage in counterproductive fear mongering about pesticide residues should be required to explain their motivations, rather than being lauded for their actions.

EPA claims to know what is the best way to protect crops and reduce risks from pesticide residues. With its regulatory blinders firmly in place, the agency is focusing on eliminating pesticides with a long history of effective and safe use, expecting them to be replaced by lower-risk alternatives. EPA's version of the "Field of Dreams" theme is, "If you ban it, better replacements will come."

EPA is not solely to blame for displaying such tunnel vision, however. The Food Quality Protection Act calls for virtual elimination of one type of risk - pesticide residues - while ignoring the unhealthful impacts of this myopic approach on the diets of Americans, especially children. Congress should rethink this well-meaning but counterproductive law.

Editor's Note: *Kenneth W. Chilton, Ph.D., is a distinguished senior fellow and manager of environmental research at the Center for the Study of American Business at Washington University in St. Louis, Mo. He can be reached at CSAB, Washington University, Campus Box 1027, St. Louis, Mo. 63130.*

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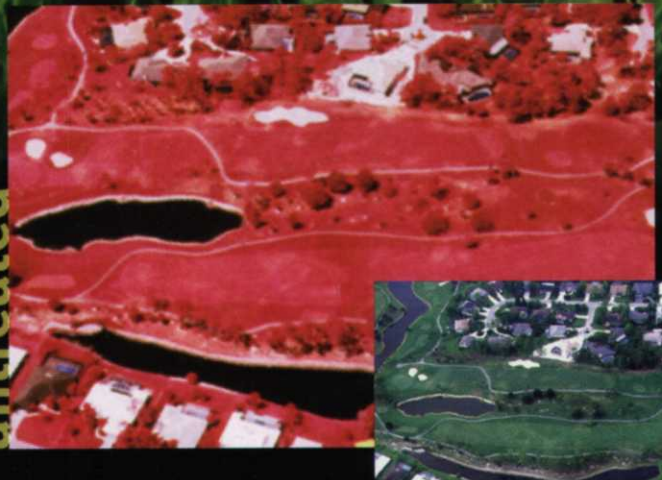
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Near infrared and aerial photography at Imperial Golf Club in Naples, Florida, captures the benefits of using InfilTRx Soil Penetrant on fairways.



Photos were taken June 8th, 1998.

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*Slash pines and open grassy areas often mean bluebirds like this male perched on a branch.
Photo by George McBath.*

The Bluebird Man of Naples Builds Nest Boxes from PVC Pipe

BY GEORGE MCBATH

In February 1994 a friend at Eagle Creek CC in Naples said, "George, you had a successful nest box program for bluebirds on your farm in Virginia. Why don't you cut out some nest boxes? We will put them together, and then you and I will hang them up." I did. They did, and we did.

The morning after hanging the boxes, I got an 8 a.m. call from an excited Eagle Creek resident telling me that there were two bluebirds standing on a new nest box across from his house. This was the first of what has become six years of

experiences showing me just how very successful golf course bluebird nest box projects could be.

That first spring we ended up with eight different pairs of bluebirds using our boxes at Eagle Creek. Three pairs nested twice, and one pair nested three times, not an uncommon circumstance in south Florida.

Those first Eagle Creek boxes were made from wood. Observations that summer suggested that I would need longer-lived construction materials. Almost immediately, woodpeckers enlarged entrance holes making the boxes unsuited for bluebirds. In attempting to move unused boxes to different locations, the wood backs tended to split. Observations after the summer rains indicated I was going to have problems with the wood rotting.

I began experimenting with different

construction materials and settled on a combination that has proved to be long lasting and very successful. The body of my houses is now made from discarded, used pvc water and sewer pipe, 6-inch diameter for bluebirds, 4-inch and 8-inch diameter for other cavity nesters.

These pvc bodies are almost indestructible. The attachment bracket for securing the nest cylinder to the tree comes from scraps of plastic lumber discarded from the dock-building industry. This plastic lumber is produced by melting down No. 1 and No. 2 plastic milk and soda containers. It too is indestructible. The tops and bottoms of the nest cylinders are made from heavy-duty aluminum which is both recycled and recyclable.

With increasing interest of golf courses in the Audubon Cooperative Sanctuary Program — which promotes

the use of recycled and reused materials — my pvc nest cylinders have really caught on. Over the last five years I have put up more than 1000 nest cylinders on 30 central and south Florida golf courses.

Two experiences I had early in my bluebirding indicated that the existence of nice populations of bluebirds in south Florida is not widely known: I once telephoned Lawrence Zeleny, founder of the North American Bluebird Society to get some information.

He asked me where Naples was and when I told him he said, "Forget it! There are no Eastern Bluebirds in that area."

Boy did he have something to learn.

On another occasion I told Bernie Yokel, president of Florida Audubon Society, of my nest box success at Eagle Creek, a property adjacent to Rookery Bay where Bernie had spent two years doing research. He told me that he had no idea that bluebirds were in the area.

Why is there so much interest in bluebirds? Why do people want to promote them by building nest structures? Why do bluebirders throughout the U. S. tend bluebird trails which each year fledge more than 50,000 young from artificial nest structures? Few birds in the U.S. are as colorful as the male bluebird. The blue of the back and the orange-red of the breast are brilliant. Few tropical rainforest birds are more colorful.

Bluebirds should not be confused with the more widely spread blue jay which is about 80 percent larger and has blacks



Male bluebird on top of "raccoon proof" pvc pipe nesting box. Photo by George McBath.

and grays mixed in with its blue. Often when I question golfers about bluebirds, they describe to me the blue jay. The bluebird song is cheerful and pleasing to the ear. Bluebirds are quite gentle, not displaying the aggressive and predaceous qualities of grackles, crows, and jays.

Bluebirds are very accepting of humans and permit very close observation. I have had bluebirds nest at eye level within 10 feet of cart paths and just as close to people's patios.

When I open the top of a nest cylinder to check nesting activity, often the female Bluebird will remain on her eggs

which are within six inches of my eyes. When I show this to golfers, it blows them away.

During the first half of the twentieth century, when our country was more rural, bluebirds were much more abundant. I think many older people are partial to bluebirds because they remind them of times that were much less hectic, crowded, and materialistic.

The exotic European Starling outcompetes bluebirds for abandoned woodpecker cavities to be used for nesting. Bluebirds, by being so accepting of artificial housing, give people positive feelings that they are doing something

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Raccoon Proofing

Raccoon-proofing a bluebird nest cylinder consists of:

- 1) driving a 5-foot-long, 1/2-inch diameter piece of steel rebar 30 inches into the ground;
- 2) slipping a 5-foot long, 1/2-inch diameter piece of steel electrical conduit over the rebar;
- 3) bolting the nest structure to the conduit; and
- 4) waxing the conduit with a carnuba based car wax.



Bluebird Potpourri

LEVEL: When I put up nest cylinders, I always use a carpenter's level. For birds that lay their eggs on the cylinder floor, eg. screech owls and woodpeckers, it is important that the floor be level, both left-right and front-back; otherwise eggs will roll to the cylinder wall. Since bluebirds build nests within the cylinder usually out of pine needles with some grass and palmetto hairs, their nests prevent egg rolling thus functionally leveling the cylinder. Nevertheless, I still level the cylinder for aesthetic reasons.

SPRING CLEANING: Bluebirds build a new nest preceding each clutch of eggs they lay. A nest structure will become filled with nests and unusable to the birds after two or three broods. This can occur in just one nesting season. Therefore it is important to check nest structures each winter and discard old nests.

SNAKES: No matter how much I prepare, it is always startling to check a nest cylinder and come eyeball to eyeball with a snake. Snakes, especially rat snakes, prey on bluebirds when on the nest. Experience suggests that the more shrubs touching a nest tree, the greater the probability that a snake will be in a nest cylinder. Thus I never hang a cylinder where shrubs are touching a tree or touching my raccoon proof rebar-conduit systems.

TERRITORIAL: Like most birds, bluebirds are territorial. A bluebird pair will chase other bluebirds away from their territory. Bluebird territories extend in a radius of approximately 125 yards from the nest. Therefore, I try to keep my nest cylinders at least 125 yards apart. Frequently home owners ask me for their own bluebird house in addition to the ones on the golf course. If this request violates the 125 yard rule, I explain territoriality to them. If they still insist, I put up the house for them. Their enthusiasm will educate neighbors and gain support for the nest cylinder project on their course.

HEAT BUILDUP: Most bluebirders say that nest structures should face east so that the late afternoon sun does not heat up the structures. The two professionals who gave me the most guidance when I was starting out felt that this wasn't necessary. My experience supports this. I usually face my cylinders in the direction that most people will see them or in the direction of the most open grass. These two factors being equal, I face them east. I have not found dead nestlings in my nest cylinders which indicates that I don't have a heat build-up problem. Additionally, I paint my cylinders a light color which therefore reflects rather than absorbs the sun's rays. This also prevents heat build up in the cylinders.

COWBIRDS: Bluebird eggs are a light blue color. Occasionally I find a slightly larger white egg with brown speckling accompanying bluebird eggs in the nest. These eggs are laid by a nest parasite, the brown-headed cowbird. If the cowbird egg is permitted to hatch, the larger young cowbird will heave the smaller young bluebirds out of the nest. The adult bluebirds end up raising a cowbird. I always destroy cowbird eggs.

good for the environment as well as for these wonderful little creatures.

And finally people like bluebirds because their diet is almost entirely insects. I have found parts of mole crickets in their nest cylinders. Is there anyone who doesn't hate bugs? They will eat wild berries in the winter.

Of the 30 central and south Florida golf courses that I have done breeding bird nest projects on, only nine courses have had bluebirds. Please note that

screech owls, great crested flycatchers, red-bellied woodpeckers, downy woodpeckers, carolina wrens, brown-headed nuthatches and purple martins in various combinations have also used my nest cylinders at these courses.

In south Florida most golf courses have been built in areas where the original plant communities were coastal scrub, wet cypress woods or slash pine flatwoods of either the dense, xeric palmetto type or the more hydric, open type

dominated by grasses and shrubs.

Of these four plant community types, bluebirds are almost exclusively found in the more hydric, open flatwoods. Therefore only golf courses built in this latter plant community will have bluebirds. So far it is only on these courses that bluebirds have used my nest cylinders.

Bluebirds hunt insects by sitting on low and mid-level tree branches and searching open ground cover for insects. Apparently in the other plant community types, the ground cover is too dense for bluebirds to successfully catch insects.

However, in the process of building golf courses, a lot of dense ground cover is removed in creating tees, greens, and fairways. These open areas, if they have islands of slash pines, somewhat mimic open pine flatwoods and may in the future attract bluebirds.

For this reason I put up six to ten bluebird nest cylinders on courses that appear not to have bluebirds. The hope is that at some time in the future, bluebirds will be dispersed into the area and the presence of the nest cylinders will help them become resident breeders.

Ideally bluebird nest structures should be checked every 7-10 days during the nesting season (mid-March to mid-June). Only by doing so can it be discovered whether predation, heat, ants, cowbird nest parasitism, or abandonment are affecting the nesting birds. By constant checking I learned that raccoons can be terrible predators on bluebirds using nest structures on golf courses.

I am not thrilled that it took me three nesting seasons to realize this and how to prevent it. It probably takes one to two seasons for raccoons to learn that bluebird nest structures mean a free lunch and to start regularly raiding these structures.

In my third year at Eagle Creek, five of ten nestings were destroyed and at Foxfire CC, six of 12 nestings were destroyed. At Embassy Woods CC, where I surreptitiously hung five nest cylinders, a sad progression occurred. There were five nesting pairs the first year. Three the second, and none the third. Since the

management at Embassy Woods would not let me do a raccoon-proof nest project, I removed all five nest cylinders.

Signs of raccoon nest predation on bluebirds are missing eggs or young (you need to know that eggs hatch in 13 to 16 days and young fledge in 15 to 20, averaging 19 days); destroyed nests in the cylinder (part of the nest is sticking out of the entrance hole or is on the ground); muddy footprints on the cylinder; blood and/or feathers stuck on the cylinder; or parts of dead birds on the ground.

When I realized the magnitude of my predation problem, I searched *Sialia*, the Journal of the North American Bluebird Society, and discovered a method of raccoon-proofing bluebird nest structures that had proven very successful in the upper Midwest. It is described in the sidebar.

The wax makes the conduit too slippery for the raccoons to climb. I do not wipe off the powdery wax residue. If raccoons try to climb the conduit, they leave foot prints on the residue thereby giving me an idea of what is going on. This year at Quail Creek CC. all seven nest cylinders with nesting bluebirds has raccoon foot prints on the conduits.

For the three years I have been using this rebar-conduit system, I have had no raccoon predation, but many attempts are recorded on the residue.

Each December or January when I check the nest cylinders, I throw out last year's old bird and hornet nests and make minor repairs. At the same time I steel wool and apply new wax to create maximum slipperiness of the conduit for the

upcoming nesting season.

From my six years experience with raccoon predation of bluebird nest cylinders on nine golf courses, I have come to this harsh conclusion: If a golf course has a bluebird nest structure program with nesting bluebirds and does not use a raccoon proof nest structure system, that course is signing bluebird death warrants.

I do not raccoon-proof the cylinders until a course has its first nesting success because of time, expense and other considerations. Not raccoon proofing will cause the decline and possible loss of bluebirds on that course. These beautiful creatures, fellow passengers on spaceship earth, do not deserve this. Don't be an ugly human and ignore the need for raccoon-proofing bluebird houses.

Bluebird Experiences

Once while checking nest cylinders adjacent to a golfer's home, the woman of the house rushed toward me and demanded I remove the nest cylinder which barely two weeks before she had given me permission to put up. She said she was tired of watching to see if the bluebirds were going to arrive. Two weeks was all time she was going to give them!

On another course an elderly resident who had, many years before, immigrated from Italy where they hunt and eat song birds, asked me, when I showed him a nest of hatchlings, when was I coming back to collect the "squab" and eat them. Needless to say I did not feel good about leaving those birds to his care.

Much is made of instructions for

...bluebirds are almost exclusively found in the more hydric, open flatwoods. Therefore only golf courses built in this latter plant community will have bluebirds.

building and placing bluebird houses. The house should be 8 inches deep, 5 inches wide, entrance hole 1-1/2 inches wide, and hung 5 to 10 feet above the ground. However there are always exceptions.

At Foxfire I had a nest of bluebirds that twice in a period of two weeks had its eggs robbed, probably by grackles. Two weeks later when I returned, the house was abandoned. When I checked a nearby screech owl nest cylinder, guess who was nesting in it? Those troubled bluebirds had selected a nest cylinder that was 15 inches deep, 8 inches wide, 3-inch entrance hole, and hung 15 feet above the ground. Sometimes there is just no telling.

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Another time at Foxfire I saw something I could not believe. As I approached a nest cylinder, a homeowner about 30 yards away stepped out of his lanai and rung a bell. Immediately two bluebirds left the nest cylinder and the tree above and flew to the homeowner's feeder to collect some fresh meal worms. Over the course of the spring that person has conditioned those birds to come get meal worms whenever he ran his bell. Unbelievable!

Once in late winter toward dusk, as I was hanging up the last of 24 bluebird nest cylinders at Quail Creek CC, I looked up into the tree that I was nailing the cylinder to. There sat two bluebirds watching me as I worked. How rewarding! And yes, that cylinder had nesting birds in the spring.

Late one May at the Glades CC, I was doing a nest check on a cylinder that had eggs and young birds on previous checks. As I approached the tree, I noticed an envelope tacked next to the cylinder. It was addressed to the "Bluebird Man."

In an enclosed note, a snowbird resident told me that the young birds had fledged three days before. She thanked me for providing the best thing in her life over the last six weeks. She wrote that the highlight of her days had been to watch those beautiful creatures find the cylinder, pair through song, build a nest, come and go feeding their young, and finally the fledging. Now that the birds had fledged, it was time for her to fledge back to Canada.

Audubon Cooperative Sanctuary



Female bluebird on eggs in a pvc nesting box. The strong maternal instinct to remain on their eggs makes bluebirds very vulnerable to raccoon predation. Photo by George McBath

My bluebirding activities gave an important assist to Foxfire CC in getting them registered and eventually certified in the Audubon Cooperative Sanctuary Program. Foxfire is across the street from where I live. While bicycling on their cart paths, I noticed that they had bluebirds very early, New Years Day! I surreptitiously put up five nest cylinders on their course with my telephone number on them.

About mid-March I began getting telephone calls from residents indicating they were seeing bluebirds at the nest cylinders and asking me to put up cylinders in their yards. I had done this for seven or eight people when I got a call from resident Dean Lang who asked me

to do the same. Our conversation eventually got around to the ACSP.

Dean became very interested in the ACSP and decided to take the idea to club management. Just prior to this, the club manager had made an inquiry to the ASCP, and their papers were sitting on his desk.

Dean decided to lead an "adopt a nest cylinder project" and advertised the idea on the Foxfire in-house TV channel. Unbelievably, 51 residents sent in money for nest cylinders to be placed around the course! The resident sponsor's name was put on each cylinder and its location and nesting success was reported to each resident.

Five years later Foxfire residents eagerly await the annual nesting report. I believe it was this overwhelming support for the nest cylinder project that convinced Foxfire officials to go ahead with the ACSP.

Bluebirding on south Florida golf courses has been a lot of fun for me and has been very well received by course superintendents, players, and residents. If there is any chance you have these wonderful birds at your course, I urge you to put up nest cylinders for them. It will be a very rewarding project.

Editor's note: George McBath is a retired biology professor and self-described ACSP advocate. If you have any questions about starting a bluebird nest project on your course, or maybe would like to have him talk to your chapter or golf course members, you can reach him at (941) 774-2820.

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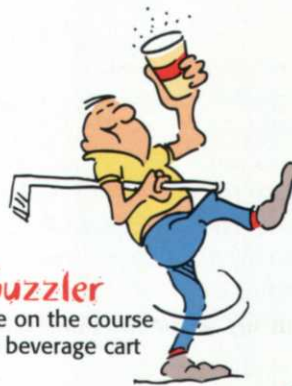
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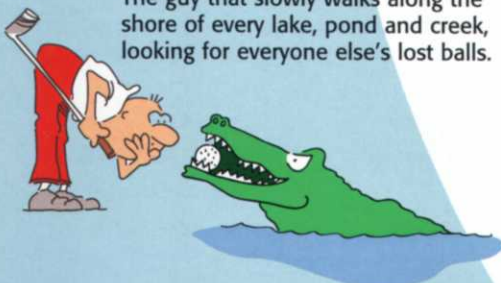
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Ultradwarf Bermudagrasses Meet the Real World (Part 3)

TifEagle: Make Sure You Have a Good Mechanic and an Extra Set of Bedknives

(Editor's Note: This is the third installment in a series of in-depth looks at real-world management of the new ultradwarf bermudagrasses.

At Pelican Sound: Loses Aesthetics, Retains Playability During Cold Weather

BY RANDY KORF

Golf Course Superintendent

Routine Cultural Practices

Mowing

We use Toro 3100 Triplex mowers daily with Wiehle front rollers and smooth back rollers. The height of cut is .125 inch, and has not been changed since January.

We also use Toro 1600 26-inch walk mowers from October through April for perimeters. Their height of cut is set to .115 inch to match triplexes. We will raise if perimeter is stressed. The reels are ground every 25 hours or sooner if needed. Bed knives are ground two or three times, then discarded (tournament thin bed knives). Primo growth regulator has not been used.

Verticutting

We use Toro triplexes with verticut reels. We go a minimum of every two

weeks, or weekly if needed, and the perimeter if needed. Depth is typically 1/4 inch but will back off to 3/16 inch from December to April. We verticut in two directions at 1/8 inch. This produces great speed and true roll. Vertigrooming has not been effective. Traded in groomer reels for second set of verticut reels. Frequent verticutting eliminates all grain.

Topdressing

A Vicon spreader is used for light applications although I think a Terra Topper would be better. A Meter-Matic is used after aerifications. We topdress a minimum of every two weeks after verticutting, sometimes weekly but only after verticutting. The sand/soil mix is same as construction material (90/10). A drag brush is used followed by an irrigation syringe.

Fertility Program

Granular products 10-2-20 and 0-0-30 are alternated every two weeks, and applied after verticutting/topdressing. Liquid products 12-0-0 with minors or potassium nitrate and a chelated minor product are alternated between granular applications. Humate is applied twice a year. Gypsum is applied every 6-8 weeks at 10 lb/1,000 sq. ft.

Aerification

We use a contract aerification service. They use Coremaster aerifiers. Our schedule:

June, 5/8-inch tines at 1.75-inch depth
July, 1/2-inch tines at 1.75-inch depth
August, 5/8-inch tines at 1.75-inch depth

September, 1/2-inch tines at 1.75-inch depth

The cores are collected and topdressing applied. A greens spiker with 1.5-inch solid tines on a drum is used from October to May. This does not disrupt the putting surface.

Irrigation Practices

We have a Rain Bird Maxi Nimbus II control system. A typical schedule applies .2 inches of precipitation daily. We typically apply .5 inches of precipitation after topdressing/fertilizing.

When hydrophobic conditions arise (frequently from March to May) a granular wetting agent is applied. Then the irrigation schedule is adjusted to a 6-minute cycle/30-minute soak and repeated for two or three total cycles.

General Comments

Contours: We see slight scalping on slopes over 2 percent, but verticutting is

Overall, TifEagle has performed even better than I expected. Response has been favorable regarding the quality of the putting surface... I cannot say that TifEagle is a better choice than FloraDwarf or Champion, but I can say that I cannot ever go back to Tifdwarf.

Correction

In the Superintendent Journal section of the Fall 1999 issue, the FloraDwarf article titled Ponte Vedra Inn should have been titled The Forest. The author of that material was Rick Tatum and not Jay Reister. Don't ask me how I did that one! JJ

TifEagle Establishment/Grow-in at Pelican Sound

(Greens had 100% coverage at week number 5)

IRRIGATION

Week 1—Every hour 7 a.m. to 6 pm
8 minutes per head

Week 2—Every 2 hours 7 a.m. to 6
p.m. 8 minutes per head

Week 3,4—3 times per day 8
minutes per head

Week 5—Once a day with about .2
inch precipitation rate

FERTILITY

Week 1—Milorganite (.5 lb N) then
ammonium sulfate (.5 lb N)

Week 2—D.A.P. (1 lb P) then
complete fertilizer (.5 lb N)

Week 3,4—Alternate ammonium
sulfate/complete fertilizer (.5 lb
N)

Week 5—Alternate use of 10-2-20 (1
lb N) and 0-0-30 (1 lb K) every
two weeks, with liquid
application in between.

ROLLING

Week 2—Roll two directions

Week 3, 4, 5—Roll one direction
each week

MOWING

Week 3—Walkmow at .200" then
.175"

Week 4—Walkmow at .150" twice

Week 5—Walkmow .150" every
other day

Week 6—Triplex .140" daily

Week 12—Triplex .135" daily (later
dropped to .125")

TOPDRESSING

Week 6—Topdress lightly

Week 8—Quadra-tine aerify, drag in
cores

Week 10—Topdress lightly

Week 12—Quadra-tine aerify, drag in
cores

TifEagle Grow-In Program at Jupiter Island

JULY 1998

9 Apply 10-10-10 pre plant fertilizer
to Group 1 greens (holes
1,2,5,6,7,8 and 9)

10 Sprig Group 1 greens

15 Fertilize Group 1 greens with 10-
10-20, setting "K."

20 Walk verticut Group 1 greens and
roll with 1 ton roller.

21 Fertilize Group 1 greens with
D.A.P. (Di-ammonium Phosphate),
Setting "L."

24 Fertilize Group 1 greens with 10-
10-20, setting "H."

27 Fertilize Group 1 greens with
AmSO4 (Ammonium Sulfate)

30 Walkmow Group 1 greens at .170
inches. No buckets.

31 Fertilize Group 1 greens with 10-
10-20, setting H."

AUGUST 1998

3 Walkmow Group 1 greens (.170").
Fertilize with 12-0-2, setting "H."

4 Spiked Group 1 greens and rolled
with Jacobsen Triplex rollers

5 Walkmow Group 1 greens (.170")

6 Spiked Group 1 Greens. Applied
pre plant fertilizer 10-10-10 to
Group 2 greens (holes
3 & 4 and 10-18)

7 Walkmow Group 1 greens (.170")
and fertilize with 13-4-13. Sprayed
with Battle.

Sprig Group 2 greens.

10 Verticut and mow (.160) Group 1
greens with triplex. Topdress.

11 Fertilize Group 1 greens with 12-
0-24.

12 Walk verticut Group 2 greens (2x)
and roll with one ton roller. Spike
and triplex roll Group 1 greens.

13 Fertilize Group 2 greens with
D.A.P.

16 Fertilize Group 2 greens with
AmSO4.

17 Triplex verticut Group 1 greens
(2x). Topdress with walking
topdressers. Fertilize with 12-0-24

19 Spike all greens (1x)

20 Fertilize all greens with 10-10-20

24 Verticut all greens. Walking
topdresser. Fertilize with 12-0-24

26 Roll Group 2 greens with one ton
roller. Mow Group 1 greens (.140)

27 Spike Group 2 greens (2x)

29 Sprayed all greens with Eco-N
and 8% Fe (Iron)

31 Verticut, Topdress and fertilize
Group 1 greens

SEPTEMBER 1998

1 Roll Group 2 greens with one ton
roller

2 Spike Group 1 greens (4x) and roll
with Salsco roller

3 Hand spread weak areas on Group
1 greens with Milorganite

4 Fertilize Group 2 greens with
Milorganite

8 Fertilize Group 2 greens with
AmSO4

9 Aerify Group 1 greens and roll
with one ton roller

10th Fertilize Group 1 greens with
13-4-13. Walk topdress all greens
1-18. Sprig putting green.

11 Spray all greens Eco-N, Eco Mix,
minors, and Battle

12 Fertilize Group 2 greens with 10-
10-20

13 Group 1 greens now puttable

14 Mow Group 1 - everyday now

15 Triplex verticut - Group 2 (2x),
Group 1 (1x). Walk topdress
Group 2 and fertilize with 10-10-
20. Roll with one ton roller.

17 Spike Group 2 (1x). Fertilize
Group 1 with 0-0-26 and Group 2
with 10-10-20

21 Fertilize Group 2 with 10-10-20.
Spike Group 1 (1x) and fertilize
with 13-4-13

22 Triplex verticut and walk topdress
Group 2

23 Fertilize Group 2 with 13-4-13

29 Spray all greens with minors, Eco-
N and Battle

30 Triplex verticut Group 2 greens
and top dress

OCTOBER

1 Mow Group 2 greens at .125

5 Begin regular maintenance on all
greens. Mow every day. Light
verticut and topdressing. Split
fertilizers between 13-4-13 and 0-
0-26.

26 Open golf course

more likely to thin the turf on those areas.

Greens construction: Modified USGA greens, no gravel, 90/10 Canadian peat mix, no preplant, sprig rate 20 bushels/1,000 sq. ft.

Overall performance:

Drought tolerance is high; when localized dry spots develop, the greens get mottled and "ugly," but it's aesthetic only, and they recover without turf loss.

Cloudy, rainy periods can cause thinning of turf on slopes and perimeters, but verticutting is a contributing factor. Daconil and Mancozeb are used to prevent/treat algae on weak areas.

TifEagle goes off color during cold snaps, turning a mottled yellow followed by purple color, which fades with a return to warmer weather.

Ball roll is excellent, with good speed and true roll. Desired green speed is easily attained and maintained, provided that the mowing height is .125 or less, verticutting is frequent, and nitrogen use is limited to prevent excess growth.

Budget factors (fertilizer, sand, pesticides) are similar for maintenance of Tifdwarf, although equipment needs are higher, maintenance of equipment is more intensive, and labor to maintain the greens is higher.

Some of the specific problems at Pelican Sound include thatch accumulation, which has been significant, especially compared to Tifdwarf. TifEagle has a 3/4-inch layer of thatch or mat or "biomass." Whatever it's called, it is a frightening aspect of the grass, and causes the localized dry spots and hydrophobic conditions because water just can't get through that layer.

Fairy rings have been a problem as well, but that is probably not associated with the grass type.

Using the Toro Hydroject caused severe scalping of uneven ridges which resulted from the weight of the machine and the softening of the aerification; height of cut would have to be raised following its use. Ideally, the greens could be walkmowed at .125 or less; it's difficult to consistently get the best quality of cut at that height with the triplex.

Overall, TifEagle has performed even

better than I expected. Response has been favorable regarding the quality of the putting surface, even though aesthetically the greens do not have a lush bright green appearance due to our maintenance practices of verticutting, low height of cut, and low rates of nitrogen. I cannot say that TifEagle is a better choice than FloraDwarf or Champion, but I can say that I cannot ever go back to Tifdwarf.

At Jupiter Island: Extremely Dense and Sensitive to Shade; Slow to Heal

BY ROB KLOSKA

Golf Course Superintendent

Establishment/Grow-in Program

I highly recommend sprigging at 30 bushels per 1,000 sq.ft. to facilitate grow-in. We also had a mixture of Nitroform and coated potash incorporated into the greens mix.

This helped tremendously to push the greens. After sprigging we waited approximately 10 days and began verticutting and rolling with a one-ton roller.

Five to seven days after that we started cutting with walk mowers set at .175 inch. After two weeks we lowered the height .010 every week until we reached .125 inches. (*See sidebar for complete grow-in program*)

Routine Cultural Practices

I recommend using walk mowers all year. We used grooved rollers in warm weather and solid rollers in the cool season. Our height of cut for the winter golf season is .110 to .125 inches and we raise them to .125 to .145 in the summer especially when we have cloudy and wet weather conditions. We maintain stimpmeter readings of 9.0.

We do less actual verticutting and more brushing and grooming to manicure the surfaces. We topdress every week. During the winter season we use dry bagged sand spread with Lesco rotary spreaders. In the summer we use a Vicon spreader with the fertilizer spout.


The turf is so dense that water has a hard time penetrating... The grass grows vertically more than Tifdwarf. Seems slower to heal over. Suggest you have a large turf nursery for repairs. Watch out for root rot and Helminthosporium when the tropical season is active.

Our fertility program consists of foliar applications all winter of 28-0-0 Coron, monopotassium phosphate, and Regal Maxi-Green. In the summer we apply 13-4-13 with Nutralene at .5 to .75 pounds per 1,000 sq.ft. per month and 0-0-30 at 1.0 lbs per 1,000 sq. ft. per month. I am experimenting with a Grigg Brothers product in weak shaded areas.

I recommend a monthly core aerification during the summer months with small hollow tines. In the winter we aerify with a Toro Hydroject. We spike almost every week.

Irrigation: I try to dry out the green's cavity. Then water heavily to promote the root system.

General Comments

The turf is so dense that water has a hard time penetrating. It is extremely sensitive to shade. The grass grows vertically more than Tifdwarf. Seems slower to heal over. Suggest you have a large turf nursery for repairs. Watch out for root rot and Helminthosporium when the tropical season is active. And last, you must have a good mechanic and extra sets of bed knives. 

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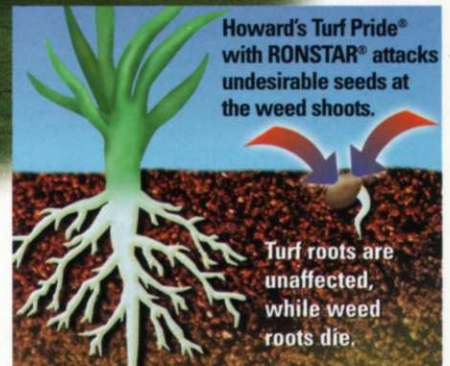
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Good Night, Irene!

A stand of five green buttonwood trees in the right rough of the second hole on The Falls County Club immediately after the eye of Hurricane Irene passed just north of Lake Worth. A small sample of 130 trees lost at The Falls C.C. Photo by Steve Pearson.



The same stand of buttonwood trees one year before Hurricane Irene. Photo by Steve Pearson.

Storm Was Weak... But it Dumped 15 Inches of Water

BY W. CRAIG WEYANDT

The Yacht & Country Club of Stuart

I had no idea that Hurricane Irene would impact the Treasure Coast... or the east coast of Florida, for that matter. When I went to sleep on Friday night the last thing that I remember was that Irene was going up the west coast and possibly going to move just west of Lake Okeechobee.

That meant lots of rain for me but not much else. There was a lot of wind and rain but with Irene being only a category 1 hurricane, I thought that there was no real concern. As everybody said afterward, 'It came so fast that I didn't really

have time to prepare.' That was especially true for me.

I woke up on Saturday morning just after 3 and had to let the dog out. He has a way of sticking his big black cold nose in my face that gets me right out of bed. We went out in the front yard like we would any other morning but something was weird this time. I couldn't figure it out.

Then it hit me... there is no wind! When I went to bed, the wind had been howling and rain coming down in buckets. It couldn't be over that fast. The storm was huge. It must be. It couldn't be. I'm in the EYE!

I ran back inside and turned on the television. I was lucky. We never lost power. I turned on the TV and WOW! I couldn't believe what I saw. The leading edge of the eye had just passed over and

we were inside. Just like they always said, no wind and no rain.

Heck, I could even see the stars. I woke the wife to show her and was surprised to find that she was not quite as impressed as I was. I told her I was going into work. She said, "You're nuts!" I said what has to be one of the most stupid things I have ever said, "Honey the eye is the safest time to be out, I better go in now." She didn't buy it but I went into work anyway.

I got there by 3:30 a.m. only to see two huge ficus (3-foot diameter) blown over in the entrance. The guard shack was

barely lit and I could hear the generator running. The guard said he was glad to see me: we need fuel and there is no power! I had a hand pump but it was still in the box and I was not in the mood to read instructions. I remember that a fuel station had power just down the road and got some cans and filled everything up.

Not much I could do as I drove around for the first time. There was no way to get on the course. The rain gauge was filled to the top at 6 inches (got to remember to get a bigger gauge). It's probably 4:30 a.m. and still not a lick of wind, but I knew it wouldn't be too long before the wind started again.

What do you do at this point?

I drove around to see the damage and was amazed at all the water and trees blown over. After all, it had been raining since Thursday (the last time that I cut the greens).

A golf course maintenance employee had come in to work by 5:30 a.m. and the guard turned him away. Lucky for me he was persistent and came over to the fence by maintenance where I could see him. I immediately told the guards to let him in to help me clear some roads where trees had fallen and get pumps started to help with all the water.

By now it is light, the wind is starting to pick up and the general manager is in. Actually, the storm was so bad the night before that he couldn't go home. He grabbed the club's camera and gave me a call to come pick him up. The damage was beyond words. Over 65 tees down just on the golf course and I would say just as many in the property owners' yards.

The real story was water, water, water. We will never know the exact total of the rain but in three days I had already measured over 15 inches. (The three-month total for August, September and October was over 41 inches).

The streets have been cleared, drains checked and opened and power was coming back on in some areas. It was time to go home and get some rest.

Sunday came early and the water was still there. The most important thing for me was to get the greens mowed. I had

To: Mr. Kaplan, Board of Governors

From: W. Craig Weyandt, GCS

Date: October 18, 1999

Re: Hurricane Irene

The purpose of this memo is to bring understanding of the current condition of the golf course and some of the future challenges of the Grounds and Greens Department.

Drainage - In three days, the Yacht & Country Club received over 11 inches of rain. The exact amount cannot be determined because the gauge was overflowing when I arrived at work on Saturday morning. The three-day total adds up to 149,347,000 gallons of water that the CCA had to deal with. Even on the dry holes like No. 11, 16, and 17 there is standing water two days after the rain has stopped.

Some of the problems are getting access to the debris, mowing, and standing up trees that can be saved. The rain accompanied by cart and mower traffic increases the compaction of the soil and turf under these wet conditions. Some areas of the course where water will sit for days can develop scald. Scald is the condition that exists when a turfgrass plant collapses and turns brown under standing water, high temperature, and intense light.

Bunkers - This is the third hurricane (Floyd, Harvey, and Irene) to impact the Treasure Coast area this year. Rain and wind have to be the worst things for bunkers. During Floyd we did not receive that much rain but the wind was fierce and physically removed the sand from the bunkers. Harvey and Floyd hit us with both barrels (wind and rain).

Both wind and rain damage can be obvious. Wind by physically moving the sand but rain has more lasting damage. First the rain washes the sand off the face of the bunkers then in some cases the bunkers are covered with a layer of silt. This silt can change the physical characteristics of the sand (color and texture). In order for the bunkers to play consistently, each bunker will have to be evaluated and necessary action taken. What this adds up to is labor and lots of it.

Trees - No one can miss the amount of tree damage that has taken place with Irene. As a matter of fact this is the most damage the course has sustained in my eight years of employment with the CCA. Sunday morning was the first opportunity that I had to ride the entire golf course and take a count on fallen or damaged trees that would have to be removed. The number even surprised me at 63. This includes the front entrance where three large ficus trees are blown over. One ficus on the north end of the wall will be removed and the two at the front entrance will try to be saved.

Labor - I have come up with a new formula for Hurricanes and the damage they create.

(Hurricane x golf course = Labor). I should say labor to the second power because not only will I have to clean up all the damage created by the storm but I will have to keep up with the daily work as well. The maintenance staff is already behind because of the irrigation project done in-house over the summer.

Now is the time that we normally reserve for grooming the golf course and this clean-up process will delay things even more. We all know of the labor shortage problems and the need for a quality trained staff. Rest assured, nothing will be spared in cleaning up of the course and getting it groomed for the season.



Flooded low lying areas like this on the 7th hole of the Y&CC of Stuart make it impossible to get around the whole course to begin clean up and repairs. Photo by Craig Weyandt.

not mowed the greens since Thursday and things were getting a little too tall. I used three people to clear debris in front of the mower. One little stick left on the green and it would have a scar that could last over a month.

Second came clearing the cart paths. I knew as soon as the sun came out that everyone would want to see the carnage. The one thing you can't move fast enough is the water. People will drive around the puddles not thinking that the turf's wet too. So use ropes, signs, whatever means possible to let them know that things are still wet.

A great help in moving the water was a "mow" pump from Stuart's Pelican Pumps. If you do not have one, they are a must. It looks like a jacked-up flymower but this time the impeller moves water through a 2-inch hose. If you have some place to move the water to... the mow pump will move it. This did not prevent all the scalding of some of the turfgrass but it definitely helped reduce it.

Monday Oct. 18, and overseeding day for me. I had no choice but to go for it. I knew the course would be closed for another day or two and I had better take advantage of it because the last thing anyone will want to hear is that the course is closing again. It was great watering the

seed automatically. Normally syringing the seed takes two or three people and now the computer did it.

As a matter of fact, while the course was closed we did all we could to take advantage of it. We painted tee markers, signs, etc while there was no one around. The first days of the week were spent helping tree services clear the major debris while the last part of the week was spent in the bunkers.

Without even thinking about it we had a plan to deal with the cleanup. Clear the debris, mow what you can, bunkers were last, and thank God we had a blower. I don't know what we would have done without it. The blower took fairways that looked terrible and 2 hours later you would have never known that a hurricane had come through just days before.

The downed trees were not removed all at once. I met with a tree service and developed a plan of what had to be removed and what would be first. Some areas were not accessible because of standing water but always the priority remained of getting the golf course playable. There were so many small trees and palms down that we had to buy a banding tool and make dozens of tree stakes.

The tree company gave me each Monday after the storm to continue clean-up and it took four weeks to finish. This may sound like a long time but the priorities were kept and maybe seeing a down tree in the rough is not such a bad thing.

It is a great reminder to those who did not get to see or feel the storm. There are many things that I would do differently if this ever happens again but one thing I will do the same is communicate.

On Sunday night I sat down and typed out the current status of the golf course for the general manager and board of



The rough on the Y&CC of Stuart's 6th hole under three feet of water. Photo by Craig Weyandt.



This live oak between the 3rd and 4th hole on the Y&CC of Stuart was used for screening errant shots. What kind of price tag do you put on this loss? Photo by Craig Weyandt.

directors. This memo explained how much rain we had received, how many trees were down, and the basic plan of attack for dealing with the problem. So communication was good but next time I will take more pictures.

When it was all over, the course had been closed for nine days after the hurricane and there are a few less trees but the overseeding came up great, and overall we feel lucky that things were not worse.

Flooding Usually Worse Than Wind for Golf Courses

BY JAMES B BEARD, PH.D.

The hurricane season in the Atlantic Ocean has brought major flooding problems to eastern North America. The high winds associated with hurricanes typically result in the downing and uprooting of trees.

This may result in the need for extensive debris removal from turf areas where tree limbs and various materials torn from buildings and other constructed facilities are strewn.

This wood, metal, and similar debris should be removed as soon as possible in order to avoid interference with mowing operations and potential turf injury by light exclusion.

Soil Deposition

The dimension of hurricanes that can create the most injury to turfgrasses is the very intense rainfall and resultant flooding of turf areas. Recent intense rains on the east coast of the United States ranged from 10 inches (25 cm) to as high as 25 inches (63.5 cm) in less than one day.

The lateral water flow from slopes onto lower areas of the floodwaters results in the deposition of soil, including clay, silt, and salt. Salt deposited on the grass leaves should be washed off as soon as possible to prevent physiological desiccation and death of the turfgrass plants.

The deposition of clay and/or silt creates a fine-textured layer that is prone to compaction and can become relatively impermeable to downward soil water infiltration for years to come. Thus the removal of this soil deposition as soon as possible is very important, especially from high-sand root zones on putting

greens and tees. The thin layer of soil remaining after mechanical removal of thicker layers should be washed off to the extent possible using water that is pressurized and directed through large-volume hoses.

Submersion Injury

Flooding that persists for an extended period of time can cause the death of certain turfgrasses. Complete submersion under water can result in soil oxygen depletion within a matter of hours. This may result in death of the root hairs and subsequent yellowing of the turfgrass plants due to a nitrogen or iron deficiency.

Ultimately, death of the turfgrass plant may occur by one of several mechanisms, including (a) a build-up of certain toxic compounds, such as ferrous and sulfide ions formed by reduction of anaerobic soil conditions, (b) the accumulation of toxic organic compounds, such as methane or carbon dioxide produced by the decomposition of soil organic matter, and (c) the accumulation of toxic by-products within the plant tissue under anaerobic conditions.

The relative degree of injury to turf-

grass from submergence varies depending on the (a) turfgrass species, (b) submergence duration, (c) submergence depth, (d) water temperature, and (e) light intensity.

Submersion at high water temperatures of 86°F (30°C) can result in death of the fine leaf fescues (*Festuca spp*) in one day, whereas creeping bentgrasses (*Agrostis stolonifera*) may survive more than 60 days submergence at low water temperatures of 50°F (10°C).

Accordingly, it is important to use submersion-tolerant turfgrass species on sites that are subject to frequent flooding.

The extent of injury from submergence increases with increases in the depth of water coverage. Grasses with leaves extending above the water surface are able to survive much longer than if totally submerged. Also, grasses under stagnant or standing water are more likely to be killed than when under flowing water.

However, one of the most important factors in the degree of injury that occurs during flooding is the actual water temperature. The extent of death increases dramatically as the water temperature increases from 50°F (10°C) to 80°F (27°C).

Thus, submersion early in the year at cooler water temperatures is less likely to cause turfgrass injury than submersion later in the summer when water temperatures are high, and especially when also exposed to cloud-free, full-radiant sunlight levels.

Injury Assessment

Once the debris is collected and any soil deposition removed as completely as possible, the next step is to assess the extent of damage to the turfgrass, which may appear as a totally brown canopy. Individual plants of the desired turfgrass species from numerous locations under flooding should be lifted out and examined carefully.

Cut a horizontal cross section through the grass crowns and the nodes on lateral stems to determine if they are white, firm, and healthy, or brown, mushy, and dead. This will be an indicator of the

amount of turfgrass recovery that can be anticipated.

Numerous multiple samplings are critical to get a representative assessment. Then the decision must be made whether replanting of critical turf areas will be required to repair the damage. Removal of any dead turf plant material and thatch from the surface is important to avoid a future organic layer problem.

If soil deposition has occurred, fairly intense core cultivation will aid in disrupting the clay or silt layer that has developed. The usual establishment procedures can then be followed.

Credit: Turfax, Sept-Oct 1999; Vol.7, No. 5

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Editor's Note: Dr. Beard's article is presented as a cautionary warning of the unseen and possible long term effects from the flooding associated with this very active tropical season. Rainfall amounts exceeding 40 inches have been recorded during the 1999 hurricane season from July to October. Many portions of peninsular Florida experienced effects from Hurricanes Floyd, Harvey and Irene. Golfers and owners should be prepared for tentative turf conditions until enough time and good weather can help heal the turf damage. Weakened bermudagrass now covered with overseeding may still be weak in the spring during transition.

Golf Not the Only Agribusiness to Feel Irene's Wrath

Early damage estimates are in, and Hurricane Irene packed an estimated \$400 million punch, devastating South Florida's fall crops.

Florida Commissioner of Agriculture Bob Crawford has requested the governor's assistance in seeking an agri-

culture disaster declaration from USDA Secretary Dan Glickman.

Preliminary reports indicate that Dade County alone may have suffered losses of more than \$230 million in vegetable, tropical fruit and nursery crops.

In Palm Beach, Broward, Martin, St. Lucie and Indian River counties, preliminary surveys put losses at an estimated \$170 million.

Hurricane Irene dumped 15-20 inches of rain and had winds in excess of 80 mph when it tore across South Florida in mid-October.

Surveys are ongoing in Monroe, Collier, Hendry, Glades, Okeechobee, Osceola and Brevard counties.

Commissioner Crawford estimated that over 650,000 acres under production had been impacted by the storm. Crop losses ranging as high as 85 percent on more than 30,000 acres of tropical fruits and winter vegetables in a six-county area have been reported. In Dade County vegetable losses are estimated between 95-98 percent.

Nursery stock losses in the impacted area amount to an estimated \$215 million. In the Indian River citrus growing area, early loss estimates range from 15-20 percent on 225,000 acres.

"South Florida farmers supply the nation with more than 50 percent of its winter vegetables," Crawford wrote to Governor Bush. "It is imperative that all efforts be made to assist the hard-hit farmers in re-establishing this important production as quickly as possible."

Commissioner Crawford is asking for a declaration of an agricultural disaster for the six hard-hit and contiguous counties to authorize all financial assistance available under federal programs.

Editor's note: I share this information about our brothers and sisters in agriculture not to minimize the recovery time, effort and damage to the hundreds of golf courses in South Florida, but to reiterate Craig Weyandt's sentiments, "It could have been worse!"

Credit: Florida Fertilizer and Agrichemical Association's November 1999 newsletter



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NOW is the Time to Thank Your Mentors

Taking the High Road Was Dietsch's Greatest Lesson

BY JOEL JACKSON, CGCS

Perhaps the beginning of a new millennium is a time for all of us to look back and thank those people who helped us get to these places in our lives and careers where we can look forward with hope and promise to a new age.

For me it is a long-overdue time to pay tribute and honor to the person who set me on the path which led me to the golf industry which has been so good to me and my family.

My mentor in this profession was William H. Dietsch, Jr. Bill was a golf course architect who never got the accolades and headlines that he deserved. He did however, earn the admiration and respect of those whose lives he touched. Bill is listed in *The Golf Course*, the seminal work on golf course architecture by Geoffrey Cornish and Ronald Whitten.

Bill was one of my heroes in the golf business. Not only for the obvious reasons that I learned the hands-on part of working on a course from him, but for an even greater lesson he taught me. From him I learned to always take the high road in business.

He was a model of honesty and integrity in a business that could lend itself to wheeling and dealing. He staked his reputation on his work, and those who hired him reaped the benefits of his work ethic. He was a perfect model for a young person being exposed to the golf industry.

There were others who appreciated Bill's way of conducting himself in the business. Here's just a couple of comments about Bill's performance:

"...Bill's professionalism and attention to detail were traits that impressed me. But I was not the only one who appreciated his sincere and diligent pursuit of excellence in his work. He did not have a big ego. What he had was a tre-



Bill loved to go fishing! William H. Dietsch, Jr. Friend and mentor (1928-1999).

mendous pride in the work he performed for a client.

"...his work is exemplary and he is able to transform ideas into reality accu-

rately and within the budget parameters. Of particular importance is his willingness to listen to our opinion and give it proper consideration. Mr. Dietsch is a credit to his profession and can provide all the required services to conceive, plan, and construct golf courses. I recommend his services highly.

THOMAS J. COX

Executive Vice President
Pasadena Y&CC, 1976

"...While completing the construction of the 10 greens (Miami Springs GC), I was able to work closely with Mr. Dietsch. I was thoroughly pleased with his cooperative manner, diligence and personal overseeing the work and the ways he assisted in the work being done. He was on the job over 90 percent of his time; always concentrating on having the work absolutely perfect."

PAUL TURCOTTE

Superintendent of Golf
City of Miami, 1981

I first met Bill when I was in high school. I worked for him one summer when he was building the Apollo Beach GC south of Tampa in 1959-60. I cut my teeth on the golf course business before

A Solid Foundation

Bill received a solid foundation in golf course design and construction supervision, especially in greens shaping while working 12 years for legendary golf course architect Robert Trent Jones from the mid 1950s to 1967. Some of the courses that bear Bill's mark:

- Upper Montclair CC, NJ
- Green Spring Valley Hunt Club, Garrison, Md.
- Wilmington CC (South) Wilmington, Del.
- Arcola CC, NJ
- Birmingham CC, Ala.
- Chattahoochee CC, Ga.
- Apollo Beach GC
- Country Club of Miami (East & West)
- Ponte Vedra GC 9 hold addition
- The Homestead Hotel (Cascades Course - Lower), Va.
- Otter Creek GC, Ind.
- Offutt AFB (SAC HQ), Neb.
- Turtle Point CC, Ala.
- Broadmoor Hotel GC (West) Col.
- Fountain Valley CC, Virgin Islands
- The Highlands CC, Mich.
- Corpus Christi CC, Tex.
- River Bend CC, Ga.
- Fairfield CC, Conn.
- Albany CC, NY
- Bellereve CC, Mo.
- Tuxedo Park GC, NY

Impressive Body of Work

Bill performed either golf course design and construction, supervision, remodeling, consulting or maintenance services on the following courses while owning his own business. D - design; SC - supervised construction; R - remodel/redesign; CO - consulting; M - maintenance.

CC of Miami, 200 bunkers, (East & West Courses), Miami. (R)

Arawac GC, (9 holes), Nassau, BWI (R)

Coral Springs CC, Coral Springs (D & CO)

Calder Race Track, Ft. Lauderdale (CO)

CC of Miami, (18 hole South Course), Miami (D & SC)

Delray Dunes CC, (18 holes) Delray Beach (Co-design & SC)

Torrey Pines GC, San Diego (CO)

Fountainbleu CC, Miami (SC)

Oriole G & TC of Margate, (18 holes), Margate (D & SC)

Lakeview GC, (18 holes), Delray Beach (D)

Villages of Oriole, (9 holes), Margate (D)

Town & Country Real Estate, (18 holes), Winter Haven (D)

Tamiami GC, (18 holes), Miami (D). **

Pines GC, (9 holes), Hollywood (R & SC)

Mariner Sands CC, (18 holes), Stuart (SC)**

Pasadena Y&CC, (18 holes), St. Petersburg (R & SC)**

Still Hollow GC, (18 holes), Lehigh Acres (D)

Sunrise Lakes CC, (9 holes), Sunrise (D & M)

Villages of Oriole, (18 holes), Delray Beach (D & SC)

International Gardens CC, (18 holes), Miami (D & SC)

Duck Key Land Sales, Inc. (9 holes), Duck Key (D)

Development Corp of America, (18 holes), Clearwater (D)

College of the Virgin Islands, (9 holes), St. Thomas (R)

Bay Beach GC, (9 holes), Ft. Myers (R)

W.B. Homes Inc., (9 holes), Sunrise (D, SC & M)

Rolling Hills CC, (9 hole addition), Davie (D & SC)

Miami Springs GC, (10 greens), Miami Springs (R & SC)

Cypress Lakes GC, (18 holes), West Palm Beach (D & SC)

Meridian GC, (9 holes), Lantana (D)

Beachview GC, (9 hole addition), Sanibel (D)

Lake Worth GC, (back 9 holes), Lake Worth R & SC)

Negril Hills GC, (18 holes), Jamaica (CO)

Qingdao and Jimo Projects, China (CO)

Holiday GC, (9 hole addition), Panama City Beach (D, SC & M)

San San Resort (9 holes), Port Antonio, Jamaica (D & SC)

**I worked with Bill on these projects 1971 - 1973.

triplex greens mowers and utility vehicles were invented and I learned the lore of the golf business as he told stories about the many projects he had been on while working with Robert Trent Jones, the leading architect of the time.

Some 10 years later, I would find myself in a straw hat wearing a hatchet on my belt, tromping through the bushes as Bill's assistant after he started his own golf course design business. I worked with him on three projects, but the fuel crisis of 1973 put a hold on a lot of construction projects. He carried me on the payroll for several months and helped me land a maintenance position at Pembroke Pines. And the rest is history.

I will treasure all my memories of working with Bill and just keeping in touch over the years with him and his

wife Rosemary. He could tell some tall tales and we had our fair share of laughs. Bill was an outdoorsman and he loved to fish. I'm glad I got the chance to take a few trips to some of his secret spots in Biscayne Bay, the Keys and his "snook hole" on the Little Manatee River.

This past September a mutual friend of many years, Ralph White called to tell me that Bill passed away from cancer. Many of you may never have heard of Bill Dietsch, but his hand touched a lot of golf courses, and in so doing has also in some small way touched your lives.

Thank you, Bill, for sharing your wit and wisdom with me. You helped make me a better person and a successful superintendent. To all of you, take some time and call or write your mentor and thank them while you still have a chance.

Thank you, Bill, for sharing your wit and wisdom with me. You helped make me a better person... To all of you, take some time and call or write your mentor and thank them while you still have a chance.

I'd like to add my two cents to the management-company controversy, which is about a nickel more than it's worth.

As I see it, management companies are a natural by-product of the evolution of the golf course maintenance industry, and technology is the catalyst. The "art and science of greenkeeping" began a shift in emphasis from mostly "art" to mostly "science" during the 60s thanks to television's coverage of golf's finest venues. Golfers' higher expectations set in motion the irresistible forces of technological innovation which began the transformation of

"greenkeepers" into professional golf course superintendents. The coming of age of the environmental movement during this same period accelerated the pace of this transformation, as targets were placed on golf courses as enemies of "the environment." Turfgrass programs around the country proliferated and the

curriculum became more technical and scientific.

As a golf course superintendent whose career has spanned more than 26 years, I can attest to our profession's technical evolution and an acceleration in this rate of change. Golf course superintendents as a group are extremely knowledgeable, dedicated, and innovative, but the diversity of disciplines for which we're now accountable makes it impossible to be proficient in all of them. Superintendents are not all cut from the same cloth. It has been my observation that most have strong agronomic backgrounds, but from there the diversity of talent branches off in many directions. Some of us are excellent with people, some have mechanical aptitudes, some have design skills, some are horticultural geniuses... it depends on the superintendent's training, personality, and personal interests. Job security and survival, however, depend upon the golf facility's wants and needs, and their perception of the superintendent's ability to provide for and satisfy those wants and needs.

Management companies have recognized and capitalized on this reality. The legitimate ones offer a diverse pool of expertise that can be applied in an efficacious manner to more than one facility. This is the theory, anyway, and it can work at the low-end club without a qualified superintendent, and the high-end club whose qualified superintendent cannot meet all the club's expectations. Most superintendents, naturally, would prefer that the club allow him to hire a qualified staff and utilize contract services to fulfill all requirements, but that decision is out of his hands. It really doesn't matter whether it was a sound decision or not at this stage.

There are a few things a superintendent can do to protect his job:

- 1) Keep all senses attuned to your club's needs and develop strong lines of communication with the decision makers. As Dan Jones was fond of saying, "You've got to give them what they want even if they don't know what that is."
- 2) Take advantage of educational opportunities that are pertinent to your club's particular needs and that address your personal deficiencies. Prove to your club that you are a valuable asset in many diverse fields and they will find it difficult to seek your replacement. Note that the larger management companies require attendance by their superintendents at educational venues like chapter meetings and FTGA conference and show.
- 3) Support those trade organizations like FGCSA and FTGA that support university research, as they are the ones most likely to develop products and practices to save your club money. Economics may not be the reason for all decisions to switch to a management company, but it is at the heart of most of them.

Management companies are not a passing fad or a blip on the radar screen — they are a reality of golf course maintenance moving into the new millennium. You can fight them, join them, or coexist with them — just think long and hard about your strategy. Just remember that General Custer thought he had those Indians right where he wanted them just before the battle of the Little Bighorn!

From Art to Science

Mark My Words



Mark Jarrell, CGCS President, FTGA

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What's the old saying, "Everything old is new again?" I hope so. It's been tough enough listening to the media hype, alarmists, survivalists and the four horsemen of the Apocalypse go on and on about what's going to happen when Y2K chimes in.

If you're reading this, then I guess they were all wrong. Of course I read someplace that one mathematician figured out that the 1,000 years since Christ's death actually took place in 1997, which wasn't exactly as catchy a sound bite as Y2K.

It's pretty amazing to be part of a change in centuries, to say nothing of millennia. Maybe at my age it just seems significant. There's a whole generation of crumb crunchers and rug rats that won't even

notice as long as their Nintendo Play Stations are Y2K compliant.

I hope you checked out your irrigation computers and they just kept humming along, or beeping or whatever. At any rate, it seems like the biggest headache associated with the year 2000 will be to find some sort of catchy handle. The years 00 to 09 may indeed be a challenge, but I have faith in man's ingenuity to solve even that one.

What I'm more concerned with is the evolution of our social graces as we rocket into 2000 and beyond. The developments in technology in the coming years may revolutionize the way we manipulate information and machines, but people still need to practice professionalism and good, old-fashioned manners.

The item that sparked my concern as we mount the millennial threshold is such a simple thing that I almost hesitate to mention it, but at

the same time, it makes me wonder where we're headed.

Last August at the Florida Turfgrass Conference in Gainesville, nine turf students were given scholarships to aid them in their education. Four months later only two of them have written thank-you letters to the association.

I'm sure they said "Thank you" to the presenter at the podium that night, but they also have an obligation to the hundreds of members who worked to put on fund-raisers to raise that money and those who sat through committee meetings on budgets and awards that resulted in allocating those scholarships.

Their thank you's should be a matter of record in the association's minutes and publications, so everyone knows their efforts are appreciated. I don't want to chastise these youngsters too harshly for perhaps a lack of understanding or momentary lapse in etiquette, but there is a lesson to be learned.

Professionalism starts when you learn to say "please" and "thank you" at home.

Work habits and personal conduct begin during these embryonic days of a career. Might as well learn to do it right early on and build a good reputation from the start. I can remember listening to a motivational tape by Arnold Palmer. One of the things he talked about was how his parents taught him proper table manners at an early age.

Wise words from the son of greenskeeper whose father had to use the back door of the clubhouse. Arnold now owns that golf club and has been a Presidential guest at many a state dinner.

It just goes to show you never know where your road may lead you. No matter what the destination or what millennium you're in, good manners will help you along the way.

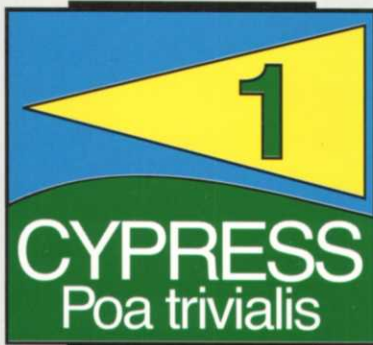
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