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Keller re-emphasized that many of these programs are very site-specific. The point is that during these challenging times for golf course budgets, there are some creative ways to help out the bottom line if you and the owners and members are willing to make a few changes.

Steve Keller got into the golf business by geographical proximity. In 1974, when he was nine years old, Keller’s father bought some property next door to the semi-private, Belvedere Golf Club in Charlevoix, Michigan. Keller and his brothers helped clear the five-acre parcel, pick up stones and grass and landscape the property.

When he got older, he got a job on the course in golf operations, tending carts, picking the range, working in the pro shop and, in fact, was planning to go to PGM School at Ferris State College. As he got closer to the game and out on the course, he found his true calling and ended up getting his two-year turf management degree from Michigan State.

Keller started the Florida chapter in his career in 1984 at the historic Pine



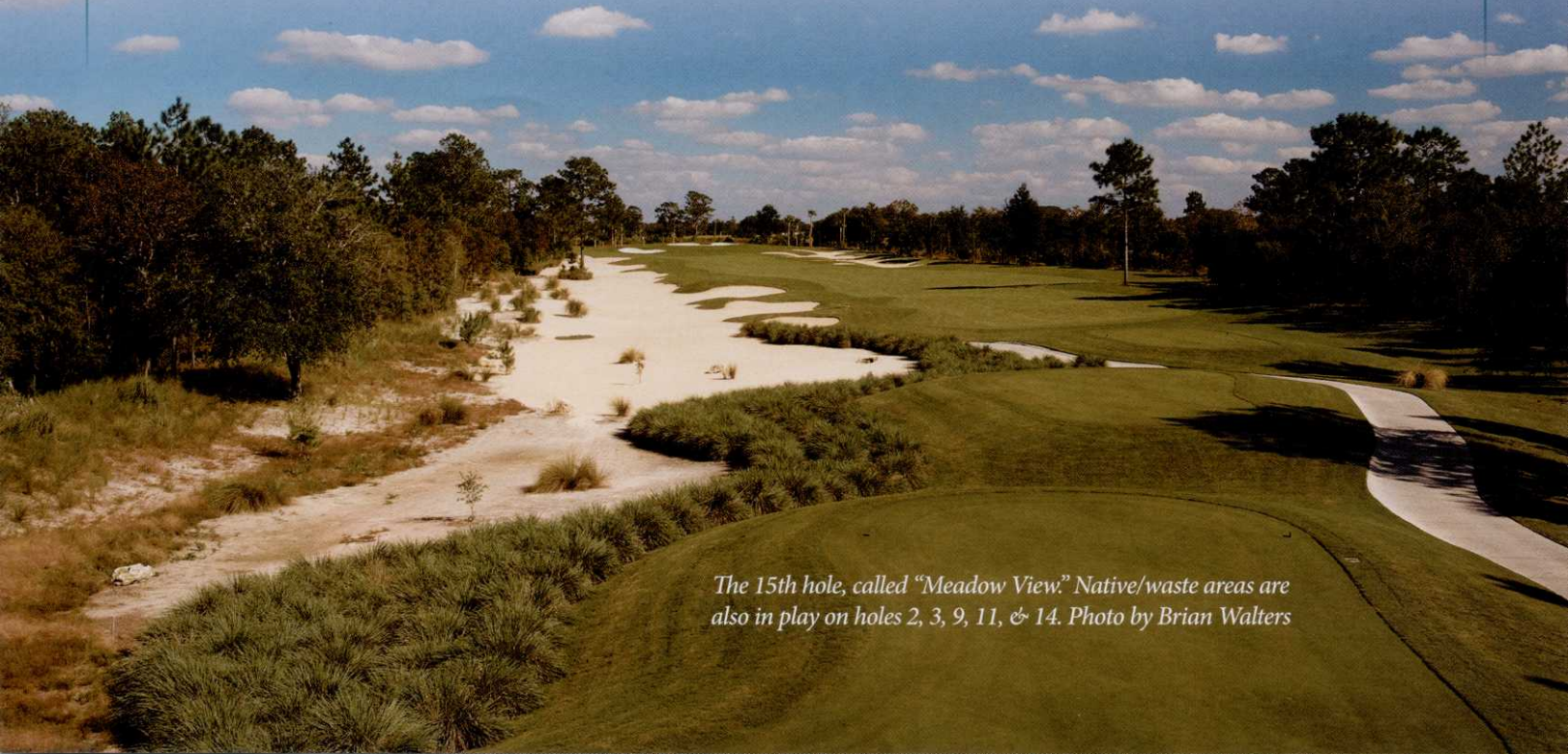
Close up of the 18th green showing a few of the waterfalls on the course. Photo by Joel Jackson

Tree Golf Club in Boynton Beach, and methodically worked his way up the coast to Vero Beach before jumping all the way up to Bluffton, SC to work the construction, grow-in and opening of the Berkeley Hall course in 2000. He returned to Florida for a three-year stint at my old alma mater, the Isleworth Country Club near Orlando. Since 2006 he has been at Juliette Falls, where his sons Taylor and Johnny both enrolled at Central Florida Community College and also work on the course.

While Keller’s maintenance programs may have had a strong economic

driver, they are also environmentally friendly due to the reduced inputs. In the current trend of local regulations on fertilizers, Keller’s actions and results speak louder than mere words.

Keller told me soon after my visit that he would be attending a Marion County Springs Basin Working Group meeting over regional water quality concerns. He can matter-of-factly point to his programs, where he can demonstrate how the Juliette Falls Golf Course values their environmental treasure at the end of the Rainbow!



The 15th hole, called “Meadow View.” Native/waste areas are also in play on holes 2, 3, 9, 11, & 14. Photo by Brian Walters

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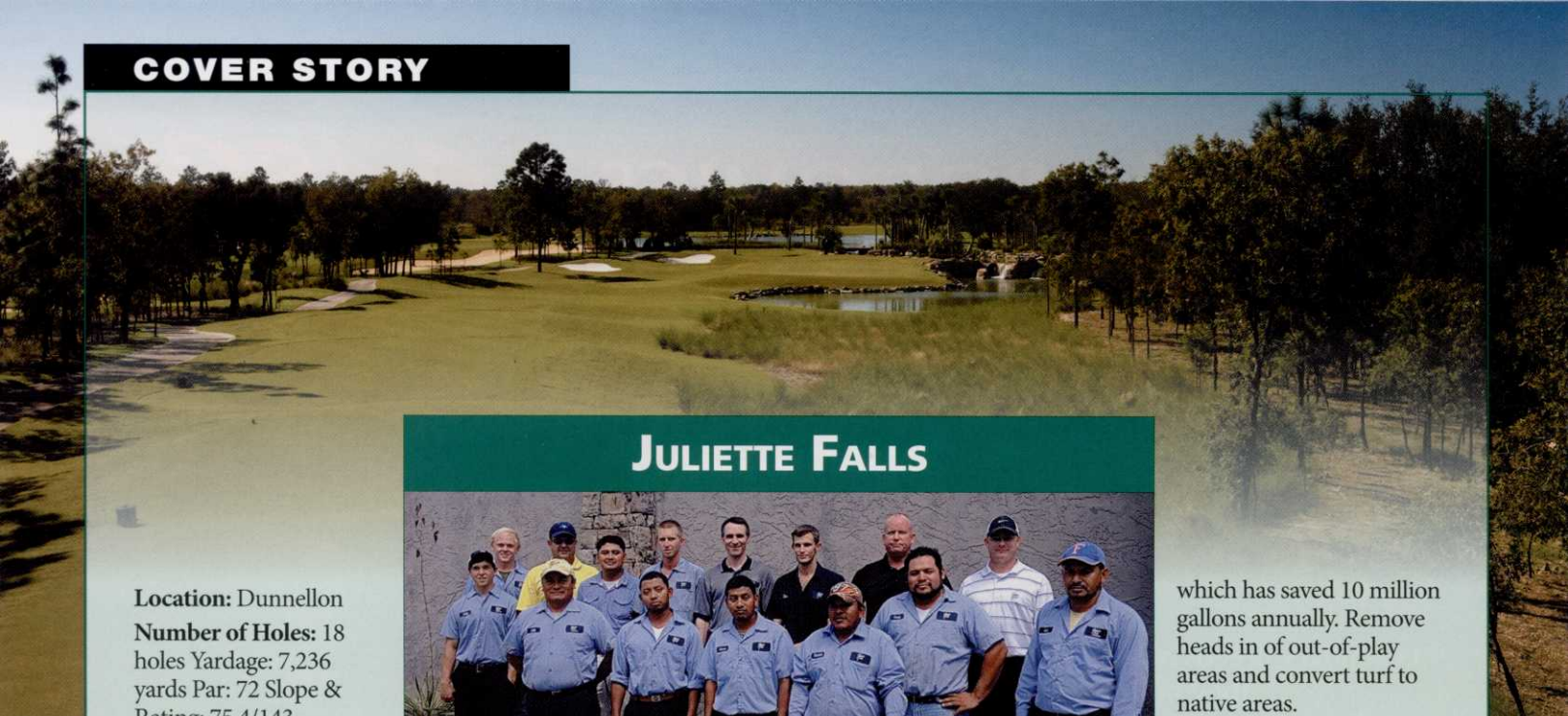
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JULIETTE FALLS



Juliette Falls Maintenance Staff.

Location: Dunnellon
Number of Holes: 18 holes
Yardage: 7,236 yards
Par: 72
Slope & Rating: 75.4/143
Ownership: Ron Clapper
Playing Policy: Public with memberships available.
Average rounds per year: 40,000.

Designed by: John Sanford.

Opened: October 17, 2007

Management Team: Club President Ron Clapper, Head Golf Professional Travis Daniels, PGA Professional and Golf Course Superintendent Steve Keller

Special and Ongoing Projects: Reducing out-of-play irrigated turf areas and installing native lovegrass plants. They do best when irrigation oversprays those areas. We just finished planting 2000 aquatic plants along shorelines. A company call Lake and Wetland is helping us with weeding and littoral shelf plantings.

Acreage under maintenance: 120.

Greens: Turf Type: Jones Dwarf
 Average size 6,500 sq.ft. Acres: 4
 Height of Cut: .110 to .125 inches. Raise HOC after first frost. Overseeding: none. Green speed goals: 10.0

Tees: Turf Type: Jones Dwarf. Acres: 4.0. HOC: .400". Overseeding: None.

Fairways: Turf Type: Tifway 419. Total acres: 30. HOC: .500-.700 (Higher HOC during periods of stress. Overseeding: None.

Roughs: Total acres: 60. HOC: 1.50 – 2.0". Overseeding: None

Bunkers: Number of bunkers 70. Sand type: G-Angle from Golf Agronomics Supply and Handling. (One of the first courses to use G-Angle sand.) Mostly

machine raked with hand raking as needed. Equipment: Toro Sand Pros
Naturalized/Native areas/beds: 18+ acres of native grasses. 5 acres of crushed coquina waste areas that also double as cart paths. Waste area in play on holes 2, 3, 9, 11, 14 & 15.

Waterways/Lakes/Ponds: Five lakes covering 4 acres surface area. How maintained? We brew 2 gallons of microbes daily (BioAmp) and disperse in lakes to digest any nitrates, sludge or other organic matter buildup. Watering Restrictions: Allocation amounts via annual consumptive use permit from SWFWMD and any additional emergency drought restrictions when they are in effect.

Irrigation: Source: Well water. Pumps: 2 – 75 hp pumps and a 20 hp jockey pump with a Flowtronex control panel. Irrigation Controller: Rainbird Nimbus II. Number of heads: 752. Spacing: 90 ft. Water Restrictions: None currently in effect.

Water Management/Conservation practices: Injected 150 tons of the moisture retention product, Profile® via the Dry-Ject method in greens, tees and approaches for a total of 12 acres. We have seen a 15-20 percent reduction of water use in these areas. We have also taken the driving-range field out of irrigation,

which has saved 10 million gallons annually. Remove heads in of out-of-play areas and convert turf to native areas.

Staff: 14 full-time crewmembers. Schedule: 40 hours straight time. During winter months, we can have up to 40 frosts per season and the crew will trim trees and clean

up native grass areas when we don't need to mow. Two of the staff work full time taking care of the clubhouse grounds, driving range tee area, community common areas and residential homes.

Key Staff: Assistant Sean Plummer; Head Equipment Tech Tom Reynolds, (aka "Bones," has been with me since 2003 at Isleworth); Pest Control Tech Jesse Ayotte; Irrigation Tech Lucio Salgado. Pedro Ramirez and Sergio Hernandez have been with me for ten years. They have done everything on the course for us except spray. Both of my sons Taylor (20) and Johnny (19) have worked on the course since 2006.

Meetings: Monthly crew safety and company update meetings and daily assignment meetings. I am copied on the weekly Food & Beverage meetings at the clubhouse so we know what's happening with special events. We recycle aluminum cans quarterly and use the money for pizza parties and barbecues to express our appreciation of our employee's efforts.

Wildlife Inventory: As of July 2009, Juliette Falls is a Certified Audubon Silver Sanctuary. We have lots of wildlife including: Wild Turkey, White-tailed deer, coyotes, fox, gopher tortoises, fox squirrels, bald eagles, ospreys, kites, waterfowl and songbirds.

Top: Photo by Brian Walters

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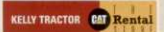
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A PENNY SAVED IS A PENNY EARNED

You can read a lot of articles about where the economy is heading and, depending on who's writing and what their motives are, they can be positive or negative. The bottom line for golf courses is what's happening at the cash register and in the bookkeeping department – revenue in and expenses out.

Golf course maintenance numbers are usually all put in the "Out" column. You can argue at the 19th hole that course conditions bring people in to play, but there is no "Credit" column in the golf maintenance accounting ledger. The only "positive" input by golf course maintenance is finding ways to make the budgeted expenses less than anticipated. Superintendents are challenged to minimize expenses without compromising quality.

The following are ideas from fellow superintendents on possible ways to do just that. Keep in mind that these ideas are

site-specific, based on weather patterns, soil types, drainage, water quality and availability and special localized stresses like topography, air movement and shade.

Steve Keller, Juliette Falls GC, Dunnellon: Refer to the cover story.

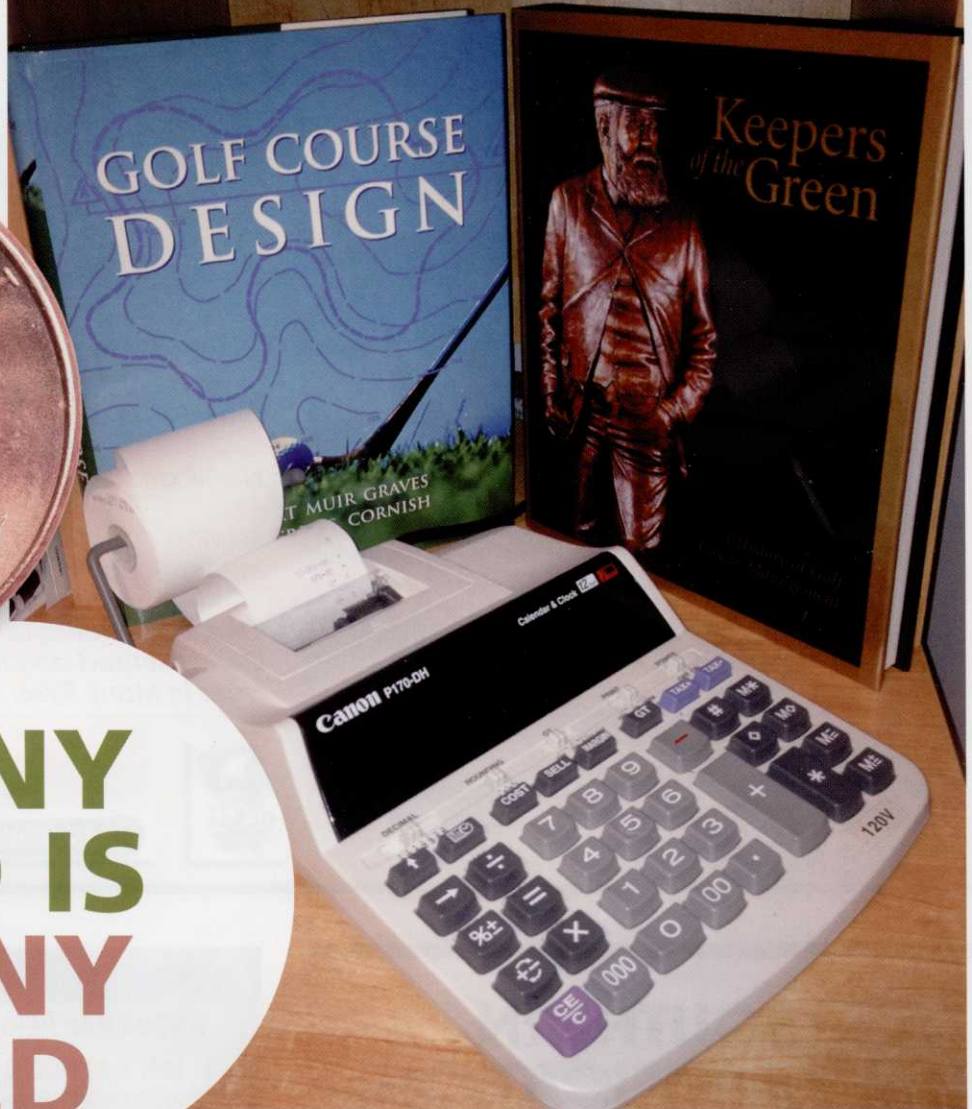
Keller did a great job of showing how he uses site-specific factors; especially weather, as it affects turf growth to allow him to tailor standard maintenance programs to reduce mowing, fertilizing, watering and pest-management programs and inputs. We emphasize being site specific and make sure you have buy-in from club management and green committees, etc.

David Dore-Smith, Copper Leaf GC, Naples:

1. In-house versus outside contract projects: We verticut fairways, tees and roughs in-house. We purchased two

60-inch-wide verticut units from First Products that allow us to verticut when we want to. The units are around \$9,000 each. However, with the cost of outsourcing verticutting 18 holes of fairways approaching \$10,000 per time, the cost savings become significant over a short period. We can be less aggressive and verticut several times throughout the summer on a schedule that suits us. With the rain we have experienced this summer, this has been a great advantage rather than being locked in to a particular date.

2. Labor hours and schedules: We have no overtime at Copperleaf. An idea that was implemented successfully is to have our staff split into 3 crews instead of the usual 2 groups. This way, when one group works a weekend, the other two groups have time off to be with family and to take a much-needed break from the golf course. On Thursday, the group



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that worked the weekend is off so as not to work overtime. On this day, greens are rolled only to help compensate for the reduced labor force.

3. Mowing schedules and frequency:

We are now mowing greens 4 times per week and rolling the other three days. Monday, Wednesday and Friday we use walk mowers. On Saturdays the greens are mowed with triplex mowers. All greens mowers have the 14-blade reels that allow us to raise mowing heights yet maintain a very high green speed.

The use of brushes on our greens mowers has also been utilized over the past few years. Not only do we use the ones that drop down in front of the basket, but also we have switched out the traditional groomers to brushes that cover the entire surface of the putting green. These brushes have been a fantastic addition to our greens presentation for our members and allow for a higher mowing height and healthier turf.

4. Fertilizer and chemical applications:

One of the biggest changes over the past three years has been the reduction in nitrogen fertilizer on our putting greens. This has effectively reduced, and even eliminated, any flushes of growth and helps to maintain consistent ball speed on the greens. While the grass clippings in the baskets have been less, the greens have been extremely healthy.

5. Use of pigments and colorants:

Copperleaf has been using pigments on its tees and fairways since last season and I have been impressed with the results. It has taken some time to find the right product and the right rate that suits our golf course. There are so many products on offer these days and each of them has a slightly different color; some are bluer and others are a darker green. We use them to supplement the color of the turf grass rather than to “paint” it. A good quality liquid fertilizer application during the mild winter we had this year was still extremely effective. The weather will dictate how much pigment is used during the winter months.

6. Cultivation frequency and techniques:

More solid tine aerification = less clean up. The use of smaller quad-tines has been effective for us; however, the most beneficial cultural practice we have

employed over the past year is the use of deep-tine aerification. The tines penetrate to a depth of 8 inches and truly break up any compaction. This work is contracted out and is completed in the morning before play. Our Toro 648 aerifiers simply cannot get to that depth.

7. Job assignments: Example: The person mowing greens also cuts cups.



Job assignments haven't changed that much but storing our daily schedules on the Dropbox® app has been another great addition. Rather than print out or copy the daily schedule, the electronic version is easily accessible through your smart phone or tablet for a quick reference. We have also stored many other useful files on Dropbox®, such as pin locations, fertilizer applications, vacation day balances, etc.

8. Out of play areas: We have converted over 20 acres of turf to native areas and frankly, I do not see the cost savings. There is still an immense amount of work to spray Round Up, refresh pine straw and trim the plant material that is extremely labor intensive. However, the beauty that these areas provide has been quite stunning and they are well received by our members and guests.

9. Irrigation System and Programs:

Over the past two years during the droughts, we have actively been changing out nozzles and moving sprinklers in areas that are clearly struggling from coverage issues. There is a wide variety of nozzles available to help improve most areas and we have seen significant improvements. We also utilize cycle/soak times on all sprinkler heads and zones with up to four

cycle/soaks on our greens loops. The efficacy of the water is greatly improved using this technique although it can extend your water window. It simply means we split up our watering programs throughout the property and vary them each night to be able to water from 10 pm to 4 am effectively. Also, the use of a “Stop Time” rather than a “Start Time” has been implemented throughout our programs. I have a better idea of when I want an irrigation schedule to stop rather than when it is to start and so almost all programs are set up this way. *(Editor's note: An irrigation cost saving tip might be to experiment with run time reductions per station or selected stations based on no or low stress locations. This requires close monitoring and experimentation, but can reduce power and water usage.)*

10. Communications: Our member communications have changed recently with the introduction of the Copperleaf Golf Course Maintenance Blog. It is extremely simple to quickly post something that is happening on the course as it is happening rather than waiting for the next newsletter publication to take place. In our bi-monthly newspaper, I now simply write to remind members of the website where they can obtain the latest up-to-date information on the course conditions and maintenance schedules. Sometimes it can be challenging to know exactly what to write about, but the use of pictures and videos and describing what is going on really helps to educate your members.

The use of Apple TV in our employee room also has been a great addition. Training videos and even highlights of the televised weekend professional golf events have been easily accessed through You Tube and shown to the staff for improved visual training.

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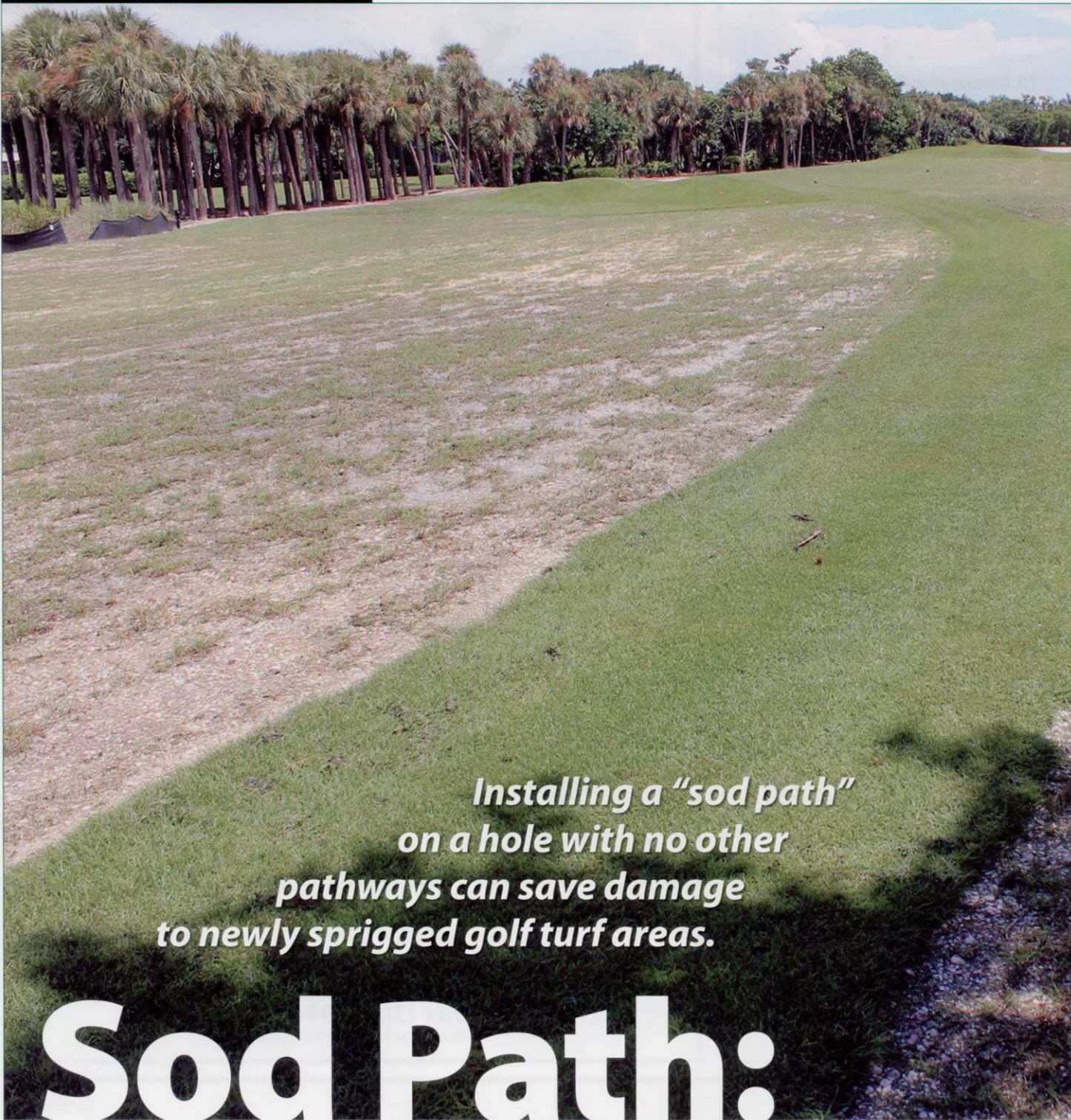
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*Installing a “sod path”
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to newly sprigged golf turf areas.*

Sod Path:

A Traffic-Control Idea for Grow-in Situations

By Kyle Sweet, The Sanctuary GC, Sanibel Island

Photo by Kyle Sweet.

We are wrapping up a project where three holes were re-grassed this summer and two of those holes do not have any cart paths.

In order to facilitate cart traffic in early October, when we get busier, I had the sod path in the photo installed, so that it can

be driven on during the grow-in as needed and for those early-season golfers so they don't impact the sprigs as much.

The path goes down the middle because the path at the tee and the green are on opposite sides of the hole so crossing

the fairway somewhere had to be accomplished. I tied the path into sodded areas on some mounds so we didn't need to lay sod for the full run of the path. I was able to use the previously installed slope sodding as part of the pathway.