SeaDwarf at Crown Colony Golf & CC

Taking Tranquility to a Deeper Level

By Tim Daniel

Most superintendents will agree that the serene, early-morning setting of a golf course provides a certain level of tranquility. I am fortunate to enjoy these priceless moments daily at the Crown Colony Golf & Country Club in Fort Myers. As the morning solitude slowly takes a back seat to the day's activities, I frequently enjoy the comments of our members and guests as they experience our SeaDwarf greens for the first time. Remarks such as "very nice greens" or "great condition" are often mentioned. That takes tranquility to a much deeper level for this golf course superintendent.

SeaDwarf is a relatively new, patented variety of seashore paspalum turfgrass. Originally discovered locally by Stewart Bennett, CGCS at Alden Pines Country Club, it is superior in texture with very fine leaf-blade characteristics. Seashore Paspalum is a warm-season perennial grass known for its adaptability to diverse soil physical and chemical situations and most notably for its tolerance to saline irrigation.

SeaDwarf became our greens turf due to the desire of the developer, Centex Homes, to create a unique, environmentally-sensitive golfing community in this competitive Southwest Florida market. Centex Homes is one of the largest, most highly regarded property-development and home-building companies in the country. However, Crown Colony Golf & CC represented Centex's first foray into golf course development.

Under the leadership of Tim Ruemler, president of the Southwest Florida Division of Centex Homes, this project revolved around prioritizing ecological responsibility and environmental stewardship. Centex retained the services of the well-respected and experienced golf course architect Ron Garl. Understanding that seashore paspalum's qualities met these priorities, Garl convinced the development group to visit the local turf developers to inspect these grasses. These evaluations demonstrated to Centex the validity of these selections as an alternative to bermudagrass.

Although Crown Colony was not intended for brackish water irrigation, the effluent water source had some salinity issues. Seashore paspalum's salinity tolerance was the first thing the developers noticed, but it was the other attributes of the turf that convinced Centex that seashore paspalum was right for Crown Colony. Other notable attributes were superior color with reduced irrigation and fertility requirements. The dense nature of the canopy meant reduced weed encroachment and herbicide usage. As Centex considered the long-term environmental impact, seashore paspalum weighed in far ahead of bermudagrass. The SeaDwarf variety was chosen as the turf for the greens and SeaIsle1 selected for fairway, tee and rough applications.

The Crown Colony G&CC has SeaDwarf paspalum on the greens and SeaIsle1 paspalum everywhere else. Photo by Daniel Zelazek.

Characteristics and Establishment

SeaDwarf is a true dwarf-type paspalum that provides a consistent putting surface with unsurpassed density, rooting and visual qualities. The regular verticutting, topdressing and year-round mowing heights below .115 in. result in yearly green speeds of 9-12 feet. The added bonus is that once mature, proper nutritional input will help maintain cool-temperature color and eliminate the need for winter overseeding in many locations.

As the construction of the golf course began, I was hired to assist the Centex land development team with construction management. Additionally, I would build a maintenance team, organize and implement a grow-in program and direct the on-going maintenance operations. Although I had grown in three courses, my only previous experience with paspalum was in managing it as an invasive grass at a coastal Georgia golf course. There, a native fine-textured paspalum had invaded some fairways and several of the old push-up TifDwarf greens over the years. Even though this native paspalum was not a dwarf-type and not as fine textured as the TifDwarf, it adapted to the lower height of cut

and was more durable on the greens in this environment.

I was excited about the opportunity to do something uniquely challenging at Crown Colony. It would represent the only golf course with all greens sprigged in SeaDwarf. With virtually no published reference literature on this variety, I leaned heavily on my prior paspalum experiences along with daily observations, to pioneer the development of the initial maintenance regimens for SeaDwarf greens. This was definitely risky, as we had only one opportunity to make a first impression. In the Southwest Florida market, it is imperative to be well received.

Durability of the SeaDwarf turf was not my primary concern. It was mostly the ability of this dwarf paspalum to equal the putting quality of the ultra-dwarf type bermudagrasses that have become the standard in recent years. Without the benefit of a previously planted nursery green, I approached the grow-in and maintenance of the SeaDwarf conservatively. Most research with seashore paspalum has centered on management under irrigation conditions of hypersalinity (>5,000 ppm TDS). Crown Colony would be irrigated with TDS levels <1,200 ppm.

Emerald Island Turf of Punta Gorda supplied the turf and planted the first nine greens at 20 bushels of sprigs per 1000 sq.ft. in early July 2001. Although nitrogen was used at 40-50 percent of normal bermudagrass grow-in amounts, the greens grew quickly with uniformity and good density. We maintained the mowing heights at 0.250 inches during the early grow-in period. The course was set to open Nov. 7, 2001. The putting green and remaining nine greens were sprigged the very last week of August allowing only nine weeks before play was to commence.

Growing in the first nine greens revealed that SeaDwarf propagated primarily from rhizomes. After the first four weeks of root and rhizome development, it was my belief we could be aggressive with reducing the height of cut. As a result, I felt comfortable in meeting this nine-week opening deadline. This approach did create a good putting surface on opening day. Without the necessary time to smooth the putting surfaces to the degree desired, we still worked our height of cut down from 0.250 in. at week four to 0.125 in. at week nine.

The shoot density increased and the putting surfaces were good but we had some scalping of small undulations. We maintained the 0.125-in. cut for three weeks before raising to 0.140 in. Immediately upon this height adjustment, the SeaDwarf sent up new shoots filling in thin and bare spots created from the scalping. Considering that this occurred with December's cooler soil temperatures, it was a real tribute to the regenerative capacity of SeaDwarf. I began to believe we were on to something good.

With the SeaDwarf resisting winter dormancy, green leaf tissue is available for photosynthesis throughout the winter season. However, due to depressed temperatures, the photosynthates are not used for growth but rather go into carbohydrate storage in the crown tissues and rhizomes. Once the increasing spring temperatures favor growth, the carbohydrate reserves are available to fuel a rapid response. Once the soil temperature (4-inch depth) reaches and consistently remains more than 58 degrees F, this rapid growth begins. This occurred around Feb. 20.

Following the initial grow-in and course opening, we worked diligently to mature the greens and remove the surface undulations still present on the green surfaces. This involved frequent verticutting, topdressing and rolling. The late February surge of growth allowed us to increase our verticutting regimen to two directions on a weekly basis at depths of -0.06 in. to -0.12 in. The aggressive verti-cutting program, coupled with reducing the height of cut, helped us stay on top of the significant spring growth surge.

Under the watchful eye of Bill Perz, equipment manager, we maintained the height of cut at 0.110 in. throughout the first season with average green speeds in the 9-10-foot range.

Once all of the imperfections were worked out, the greens smoothed and matured. The first summer brought stressful heat and humidity coupled with heavy rains almost daily, but we never saw the need to raise mowing heights. Although seashore paspalum is drought tolerant, it is however, a littoral grass. It has evolved to store oxygen very efficiently and tolerate low macroporosity conditions common to waterlogged or anaerobic soils.

Cool Season Performance

SeaDwarf grows well into the fall season until the nightly temperatures begin to reach around 40 degrees. A further reduction in growth rate is seen when the soil temperatures reach the mid-40 range. With proper nutrient levels, though, color remains good throughout this period. According to reports, research in northern regions indicates that once established, low temperatures below 25 degrees are required for the cessation of green leaf tissue.

Our winter season frequently brings extended cloud overcast conditions that may persist four to five days. The SeaDwarf paspalum retains its dark green color and high-shoot density without exhibiting elongated and spindly leaves common to bermudagrass under similar situations. This dwarf paspalum variety has also demonstrated itself a welcome host for overseeding of cool-season grasses for regions requiring this practice.

On a cool December night, a vandal decided to use one of the greens as a playground for their vehicle. Although some turf mending and sand topdressing smoothed the surface, I decided to overseed this one green. Poa trivialis was planted at 15 pounds per 1000 sq. ft. with good germination and consistent stand. Because of the striking visual similarities, most golfers were unaware we had overseeded. As the warmer spring season arrived, the Seadwarf paspalum had completely healed and the transition was smooth and flawless.

Once low temperatures slow the growth rate, we can maintain putting speeds of 11-12 feet by reducing our mowing frequency to two or three times per week and rolling two or three times per week. Here at Crown Colony, the climate in January is usually conducive for these favorable playing conditions. This is beneficial since it coincides with our heaviest play (180 rounds per day) during that time of the year.

Fertility

Charlie McMullen, Harrell's fertilizer representative, has proven valuable in developing our fertility program as he has previously worked with paspalum. The most significant difference from that of my prior bermudagrass programs is the reduced nitrogen and increased potassium input. Jay Howard, assistant GCS, implements this program, which more closely resembles that of a cool-season fertilization regimen. It consists partially of broadcast applications of a custom-blend, slow-release, granular 2-1-30 fertilizer at 14-day intervals at rates of between 0.06 to 0.12 pounds of nitrogen per 1000 sq. ft.

This low analysis allows for more control over nitrogen input through the use of liquids. Incorporated in this custom blend, Sol-Po-Mag has proven beneficial because of our low extractable levels of potassium, magnesium and sulfur. Coated slow-release potassium makes up a large portion of our total K input. Other notable additions are 5 percent magnesium and 1 percent manganese.

Our granular fertility program is supplemented by inexpensive weekly liquid foliar applications of 20-20-20 at rates of 0.024 pounds of nitrogen per 1000 sq. ft. plus a standard chelated minor nutrients package. During the heavy play in cooler season, we regularly add potassium nitrate (14-0-46) at rates of 0.016-0.032 pounds of nitrogen per 1000 sq. ft. The additional nitrogen and potassium help maintain stress tolerance. Although the SeaDwarf has inherently good color, we will occasionally spray iron sulfate between 4-8 pounds per acre prior to a tournament for maxi-

mum aesthetic value. This foliar program has an aggregate cost of less than $10 per acre.

It is common for our SeaDwarf tissue-sample potassium levels to reach 5 percent. On the other hand, nitrogen levels typically remain in the 2-2.5% range. From my experience, this nitrogen number represents 40-50 percent targeted level for bermudagrass greens. One of our goals is to apply less than 5 pounds of nitrogen per 1000 sq. ft. annually. We have demonstrated that with these fertility rates we can produce a very dense, uniform putting surface and consistent deep rooting, while significantly reducing the potential for nitrogen leaching. All of this with sand-based greens and a virtual twelve-month growing season.

Crown Colony Superintendent Tim Daniel has been on a steep learning curve with SeaDwarf and SeaIsle1 paspalum and so far he likes the results. Photo by Daniel Zelazek.

Durability and Disease

SeaDwarf has proven very resistant to ball-mark divots. However, we did experience a high incidence of ball-strike impact damage during the fall of 2002. This manifested itself through leaf tissue bruising rather than actual ball impact divots. Although noticeable, they had virtually no influence on actual ball role. Tissue tests showed elevated sodium levels from our effluent irrigation had resulted in low tissue levels of calcium, which is important for strong cell wall formation. Applications of calcium sulfate and soluble calcium as calcium chloride increased our leaf-tissue calcium levels and reduced soil sodium levels, alleviating the ball-strike tissue bruising. Calcium sulfate has become a regular component in our program.

Some of the stresses we experienced include minor occurrences of brown patch, dollar spot and fairy ring. A few applications of fungicide treatments eliminated these occurrences. These disease occurrences are less likely when the turf is maintained at higher salinity

regimes. However, *Lepidoptera* insects are a concern with Seashore paspalum under any salinity regime. Here at Crown Colony, we have sod webworm pressure from May through November. Particularly affected are the roughs, where location and increased height of cut favor insect egg dispersal.

Before I could recommend the use of SeaDwarf to colleagues, it was essential to know how these 90/10 (Sand to peat mix) greens were aging beneath the surface. Seashore paspalum is tolerant to multiple abiotic and biotic stresses but should not be viewed a utopian-type grass. As is the case with all turf varieties, managing the accumulation of organic matter and thatch is key to maintaining adequate physical properties and continued root system viability. Although I was unable to quantify tolerance differences, this core principle remains true even with seashore paspalum.

To monitor the aging process I retained the services of The International Sports Turf Research Center. In December, field representatives Dave Doherty and Nat Hubbard took core samples from four greens. Three of those samples were to a 4-in. depth while the last was to a 12-in. depth. The numbers generated established an initial benchmark and provided a basis for evaluating their aging process. Matt Pulis, M.S., ISTRC head agronomist, analyzed these test results and wrote in his report that "the SeaDwarf greens have similar physiological characteristics and physical properties to the new bermuda and bentgrass varieties..." and "...the turf canopy is very dense and the root system mirrors the canopy density."

The December core test results for our SeaDwarf greens indicated a good balance of physical properties for one- to two-year-old greens. The percentage of organic matter confined to the upper 1 inch was slightly high but not unexpected. These organic levels are consistent with the newer bermudagrass and bentgrass varieties. Continued regular monitoring of the physical properties and the rate of aging will give us valuable information needed to implement appropriate future aerification programs. In the fall, we will again test the greens to monitor the effectiveness of our summer aerifications.

Working with SeaDwarf has been a pleasure. The low nitrogen requirements needed to maintain a high quality-putting surface is remarkable. Also, this dwarf-type paspalum has impressed me with its deep root development even when mowed at our most recent cutting heights of 0.095-0.100 in. This extensive root system allows for lowered irrigation requirements. It's been nice not to worry too much should our irrigation system break down or miss a cycle over the weekend.

Playability and Aesthetics

Since the opening of Crown Colony, the SeaDwarf greens have performed extraordinarily. Aside from some initial issues with bumpiness, most likely due to the rapid grow-in and surface undulations, our club general manager, James Mason, and the clubhouse staff have relayed daily compliments on the appearance and putting quality of the SeaDwarf greens. Unlike the ultra-dwarf bermudagrass varieties, SeaDwarf is more forgiving to broader soil microclimates. They have been true and consistent without grain. This dwarf paspalum allows us to have greens year-round that show a remarkable, very visible and attractive striping effect.

Golfers, architects, superintendents and agronomists who have visited Crown Colony to inspect the SeaDwarf greens have been duly impressed. Occasionally, these professionals will pose the question "Given the chance again, would you plant SeaDwarf or bermudagrass?" My emphatic reply is "I wish never to plant bermudagrass again."

If the public response and our experience at Crown Colony are any indication of the future, bermudagrass will play a diminishing role while SeaDwarf becomes more widely accepted. This should allow more superintendents to enjoy the tranquility of their course rather than managing the stresses inherent with other grasses.