

Going For The Gold With Seashore Paspalum Putting Greens

Experience with paspalum putting greens over the past decade has resulted in improved management strategies and programs.

BY JOHN H. FOY



With continual low mowing, leaf blades of seashore paspalum become fine textured, which creates a very dense turf cover. Even so, intensive surface management is required to reduce ball roll resistance if medium to fast green speeds are desired.

Seashore paspalum (*Paspalum vaginatum* Swartz) is a warm-season perennial turfgrass that inhabits many tropical to temperate coastal locations around the world. It is classified as a halophyte, which means it is a salt-tolerant or salt-loving species. This characteristic, in combination with concerns about declining irrigation

water quality, resource conservation, and environmental impacts, resulted in increased interest in the collection and breeding of paspalum cultivars with improved turfgrass quality characteristics. In the late 1990s, paspalum cultivars Salam, Sea Isle 2000, and Sea Isle 1 were introduced and began to be established on golf courses in the

contiguous United States, Hawaii, the Caribbean, and the Pacific Rim. This was followed by the introduction of Sea Dwarf, Sea Isle Supreme, and most recently Platinum TE in the mid-2000s. The book *Seashore Paspalum: The Environmental Turfgrass* by Drs. Duncan and Carrow and a number of general articles and research reports

have been published that discuss various aspects of seashore paspalum management. While these are certainly valuable resources, whenever new grasses are introduced to the industry, the fine tuning of best management practices occurs in the field over a period of years.

Seashore paspalum has not been managed for as long or used on as many golf courses as bermudagrass. However, with each passing year the information pool is progressively increasing. It should be reiterated that every golf facility is unique and there are some differences among paspalum cultivars. Yet, common denominators in the maintenance and cultural practices being employed have emerged, and the following is a review of management programs currently being used to produce top-quality paspalum putting greens.

GROW GRASS, BUT NOT TOO MUCH FERTILITY

It is known that seashore paspalum has highly efficient mechanisms for nutrient uptake and utilization. This in turn results in lower requirements for most macronutrients, in particular nitrogen (see [Preventing Failure of Seashore Paspalum Greens](#)). When nitrogen is applied at rates greater than what is required to support sustained growth and a dense turf cover, a greater incidence of disease and faster rate of thatch/organic matter generation are direct consequences. Excessive nitrogen fertilization can also lead to increased mower scalping damage, softer surface conditions, and slower green speeds.

Based on research conducted at the University of Arizona, height of cut and not nitrogen fertilization rates had the greatest impact on ball roll distance, i.e., green speed, on a paspalum putting green (see [Ball Roll Distance of 'Sea Isle 2000' Paspalum in Response to Mowing Height and Nitrogen Fertility](#)). Yet, based on field experiences, very judicious nitrogen fertilization is a key strategy to provide medium to fast green speeds with paspalum.

Results of an informal survey of South Florida golf courses revealed

that the average amount of nitrogen being applied to paspalum putting greens was 4 pounds per 1,000 square feet annually. Some applied as little as 2 pounds nitrogen per 1,000 square feet annually, with the highest rate from the survey being 8 pounds.

With regard to phosphorus and potassium, as well as calcium and the micronutrients iron, manganese, zinc, sodium, and copper, maintaining sufficient levels of available nutrients while avoiding excessive nutrient applications has been proven to provide the best turf quality. Yet, it has been found at some courses that supplemental granular magnesium and zinc can help minimize disease pressure. Because multiple factors must be considered and conditions vary from one location to the next, it is impossible to provide a cookbook recipe for fertilization of seashore paspalum putting greens.

SALT AND SODIUM

A primary attribute of seashore paspalum is its increased tolerance to poor-quality irrigation water sources compared to other turfgrass species. A very wide range of salinity tolerance does exist among paspalum cultivars, but with the commonly used putting green cultivars, regular irrigation with total dissolved solids (TDS) in the range of 1500 to 3000 parts per million (ppm) is generally preferable for minimizing the impact on turf health and quality. Yet, when rainfall does not occur on a regular basis for natural leaching of the rootzone, or there are spikes in salt content of the irrigation water, increased attention must be given to nutrient management. Increased applications of potassium and calcium to maintain adequate levels in the soil and plant tissue may be required. Regular water, soil, and tissue testing are needed to determine application rates and frequencies. An electrical conductivity (EC) meter to monitor salts in the rootzone is a very useful tool to determine when leaching or flushing irrigation cycles are needed and to ensure that leaching cycles are effective. In the presence of elevated sodium levels and an exchangeable sodium percentage greater than eight percent, gypsum applications prior

to leaching irrigation cycles may be helpful. Following leaching events with applications of potassium and magnesium are often necessary, given the greater mobility of these nutrients to be leached and lost from high-sand-content rootzones.

DROUGHT STRESS

With regard to irrigation, heavier and less frequent cycles are best. Along with helping to promote deeper root system development, this basic approach to irrigation helps to minimize the accumulation of salt in the rootzone. Seashore paspalum has very good drought resistance, but should damage occur from drought stress, the rate of recovery is significantly slower compared to bermudagrass putting greens.

GROWTH REGULATION

A common denominator in paspalum putting green management is adherence to a regular treatment program with the plant growth regulator trinexapac-ethyl. The use of growth regulators on putting greens, regardless of turf species, is a standard practice at most facilities across the country. However, with paspalum, it is especially important to suppress shoot growth to provide consistent green speeds throughout the day. In recent years at South Florida golf facilities, application rates have progressively increased, and the current range is 6 to 15 ounces of trinexapac-ethyl per acre per week. The application rate is highest in spring and summer to match the most aggressive growth periods. In late fall and winter, applications continue but at rates often half of those utilized in the summer.

It was interesting to learn that at one facility trinexapac-ethyl treatments are discontinued just prior to core aeration operations in the summer. Just like other turfgrasses, when growth of paspalum is regulated for a period of time and then treatments are stopped, there is a rebound effect resulting in rapid growth. At this course, it was determined that this temporary surge in growth contributed to faster recovery following core aeration without creating the more succulent shoot tissue that occurs with nitrogen applications.

PEST MANAGEMENT

As with other turfgrass species, seashore paspalum putting greens are not immune to disease, nematode, or insect pest problems. Continual close mowing combined with the regular use of poor-quality irrigation water increases the turf's susceptibility to pests and reduces recuperative ability. Thus, a proactive rather than reactive pest management program is employed at most facilities.

thought that seashore paspalum possessed greater tolerance to nematodes compared to bermudagrass. In fact, subsequent research documented that paspalum is less affected by sting nematodes and a few other species. However, paspalum is more susceptible to damage caused by spiral nematodes (see [Still Stinging](#) for more information). At a few courses, spiral nematode levels have risen to the point that putting green turf loss occurred

seashore paspalum and bermudagrass greens, there are similarities in the cultural practices of aeration, topdressing, and verticutting. This is especially true when it comes to managing organic matter accumulation. Very low nitrogen fertilization helps to reduce the rate of organic matter generation, yet thatch and organic accumulation must still be managed to maintain a firm and smooth surface. In sub-tropical to tropical environments, two to three close center-core aerations are typically conducted annually. With every aeration, cores and debris are removed and then topdressing sand is applied and worked into the greens to completely backfill the open holes.

To aid in maintaining good moisture infiltration and soil gas exchange, regular venting with small-diameter solid tines is generally performed every two to four weeks in the fall, winter, and early spring months. Contrary to common assumption, the regular venting of putting greens does not result in softer surfaces because, with adequate moisture infiltration, venting will lead to drier and therefore firmer surfaces.



Superior salt tolerance, a bright green color, and the ability to use the same turfgrass throughout the golf course are some of the attributes of seashore paspalum.

DISEASE CONTROL

Paspalum is susceptible to many diseases, with dollar spot, large patch, Fusarium blight, and fairy ring being most common. Preventative fungicide treatment programs are considered a necessity during the fall, winter, and spring, when growth is limited and traffic from golfers is at its peak. Take-all root rot, leaf and sheath spot, and occasionally *Pythium* root rot are also problematic diseases to control, according to Phil Harmon, Ph.D., at the University of Florida's Rapid Turfgrass Diagnostic Service.

NEMATODES

Plant parasitic nematodes have long been a problem for the bermudagrass found on Florida golf courses. Based on early field observations, it was

and nematicide treatments were necessary. Monitoring nematode populations is an essential pest management strategy in areas with a history of problems.

INSECTS

With regard to insect pests, sod webworms, cutworms, fall army worms, white grubs and billbugs, spittle bugs, and mole crickets can attack seashore paspalum. However, in general, preventative insecticide treatment programs are not being conducted on paspalum putting greens.

CULTURAL MANAGEMENT PRACTICES

AERATION AND VENTING

While there are some distinct differences in fertilization practices between

TOPDRESSING

In addition to the heavy topdressing applications made in conjunction with core aeration, paspalum putting greens are lightly and regularly topdressed with sand throughout the year at courses in South Florida. Along with aiding in the dilution of organic matter, light dustings of sand on greens every seven to 14 days helps maintain optimum ball roll and playability. Typically, putting greens are lightly verticut prior to topdressing to help facilitate the incorporation of sand into the dense turf canopy. At some facilities, topdressing and verticutting are alternated every seven days throughout the growing season.

Taking a page out of the ultradwarf bermudagrass putting green management book, dried topdressing sand of medium particle size is being used throughout the primary play season because it is easier to incorporate into the turf canopy, which in turn reduces surface disruption and golfer inconvenience. As for sand application rates, a general guideline of 0.5 to 1.0 cubic feet of material per 1,000 square feet is

typically used for routine light dustings. In addition, this is where the art of greenkeeping comes into play with adjustments in application rates being made based on visual assessments, the desired results, and turf growth rate. During the summer and in conjunction with core aeration, medium to coarse topdressing sands are used to ensure adequate moisture infiltration is maintained in the upper rootzone.

VERTICAL MOWING

When sustained growth is occurring, verticutting every 14 days using triplex units equipped with standard or carbide-tipped blades is the most common program being employed. The primary objectives of verticutting are to open up the turf canopy and facilitate incorporation of topdressing sand along with maintaining an upright shoot growth characteristic of the turf. Due to the predominantly rhizomatous growth habit of seashore paspalum, surface grain is much less of an issue compared to bermudagrasses, which are much more stoloniferous. Thus, deep or severe verticutting is not necessary and can actually be quite detrimental to paspalum putting greens. This is especially true during periods of persistent high temperatures, humidity, and rainfall. Depending on the turf growth rate, verticutting blades are bench set 0.006 to 0.125 inch below the height of cut, and a basic philosophy of more frequent and lighter treatments is followed.

SURFACE MANAGEMENT AND PUTTING QUALITY

MOWING AND ROLLING

Commercially available cultivars of seashore paspalum can tolerate a wide range of cutting heights. A significant attribute for this turfgrass species is that often the same cultivar can be used on tees, fairways, and putting greens. The lower the height of cut, the shorter and finer-textured the leaves become. Also, internodes become shorter and this further increases canopy density (see [Managing Seashore Paspalum Greens](#)). Yet, compared to ultradwarf bermudagrasses, the leaves of paspalum are still coarser-textured, and

this results in greater resistance to ball roll.

With modern-day putting green mowers, incredibly low heights of cut can be achieved. Mower bench settings of 0.090 to 0.110 inch are common on paspalum. At some golf facilities, conditions dictate that slightly

higher heights of cut be maintained or that the heights be varied. However, there are many cases where a very low height of cut is maintained year-round. This is a different approach than is utilized at most Florida courses with ultradwarf bermudagrass greens, where mowing heights vary consider-



A deeper and more extensive root system can be maintained with paspalum putting greens than what is typical on ultradwarf bermudagrass greens. Proper irrigation scheduling is a key component, and increased drought tolerance is the reward.



Along with being susceptible to several fungal diseases, seashore paspalum is a preferred host of spiral nematodes. Extensive damage and turf loss can be caused by this soil-borne pest.

ably and are adjusted for winter play and the summer rainy season. This is due in large part to paspalum possessing better tolerance to lower sunlight intensity compared to bermudagrass. During persistent high temperatures, high humidity, and frequent rainfall, seashore paspalum leaf blades become more succulent, swell, and slow ball roll.

Quality putting greens with smooth, true ball roll at medium to fast green speeds can absolutely be achieved with seashore paspalum. Also, many golfers like the lush green color of paspalum. Yet, there continues to be the challenge of providing fast to very fast green speeds in keeping with the desires and expectations of some. At facilities where this challenge is being met, very intensive surface management programs are in place. Specifically, this includes more frequent rolling and mowing. Where green speeds in the range of 10 feet are provided the majority of the time, mowing and rolling are performed daily. During the winter when cooler and drier conditions prevail in South Florida, it is possible to

maintain putting speeds of over 10 feet. To provide these speeds it is necessary to double mow three to five times per week along with daily rolling. In addition to requiring more equipment and additional labor, time must be available to routinely conduct these intensive surface management practices without unduly interfering with play.

PUTTING QUALITY

It is inevitable that there are differences in ball roll and playability with different turfgrasses. Fortunately, this is usually only noticed by low-handicap and professional golfers, and they, more so than less-skilled players, possess the ability to adapt their game to different playing characteristics. As already noted, grain is not a significant concern with paspalum putting greens. However, with less intensively managed paspalum surfaces, it has been noted that golf balls will wiggle a bit as putts begin to lose speed. This wiggle does not seem to affect or change the line of the putt as in the case of surface grain.

Regardless of turf species on the greens, over the course of a round of golf, conditions can and do change, and being able to adapt to changes will always be a necessary component in playing the game.

CONCLUSION

Seashore paspalum's ability to tolerate poor-quality irrigation water will result in its continued and expanded use on golf courses in temperate and tropical locations. As more experience in managing paspalum putting greens is gained, programs will become even more finely tuned, and consistent quality playing conditions will be enjoyed by more and more players.

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