



Severe verticutting is a basic ingredient for maintaining top-quality bermudagrass greens.

Going for the Gold with Bermudagrass Greens

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FOR QUITE SOME TIME, bentgrass greens have remained the benchmark regarding putting green quality. Compared to bentgrass greens, bermudagrass greens have always been considered second rate. Standard complaints have been that bermudagrass greens are slow and grainy. In the past, when equipment limitations made it impossible to mow greens below $\frac{3}{16}$ inch, the coarser, stiffer leaf blades of bermudagrass resulted in significantly slower putting speeds.

Even today, whenever a professional tournament is played on bermudagrass greens, television commentators still mention the need to allow for the grain in the greens. Let's face it, though. When any turf variety is mowed to $\frac{1}{8}$ inch or less, is there really enough leaf surface left for grain to be a factor?

Most golfers still hold the opinion that bermudagrass greens produce an inferior play surface. As a result of this perception, efforts persist to establish bentgrass in areas where it simply is not

well adapted. While breeding efforts have modestly increased the stress tolerance of some bentgrasses, the inevitable loss of some pesticides and reductions in water availability make it unrealistic to expect that bentgrass greens can be maintained in some geographic locations. The southeastern United States and tropical-to-subtropical areas of the world are examples. In these areas, high temperatures and relative humidity limit the health and persistence of bentgrass turf. Golfers

should understand that the best adapted turf for these regions remains bermudagrass.

As in all aspects of golf course management, great strides have been taken in improving bermudagrass greens during the past 10 to 15 years. The following paragraphs review what it takes to produce consistent championship green conditioning.

The Basic Ingredients

Back in the "good ol' days," when the standard mowing height of bermudagrass greens was $\frac{1}{4}$ inch and tournament height was $\frac{3}{16}$ inch, the soil used in green construction was not so critical. The hardy nature of bermudagrass allowed it to survive in very poor quality soils. Today, however, low mowing heights place much more stress on the turf, and a poor medium can be a limiting factor to bermudagrass quality.

In Florida, some people mistakenly question the need for USGA specifications when it comes to green construction. Besides providing the proper physical characteristics for healthy turf growth, though, the moisture conservation aspect of USGA greens becomes more important in Florida due to the prospect of permanent irrigation restrictions. Quite simply, if healthy turf growth and top-quality green conditioning is to be provided, proper construction is essential.

Other factors that limit the growth of healthy turf also must be eliminated. One of the most common obstacles is excessive shade. Bermudagrass is one of the least shade-tolerant turfgrasses and requires a minimum of six to eight hours of direct sunlight each day to sustain healthy growth. Early morning sun is especially important for reducing the presence of free moisture, which increases the potential for disease outbreaks and surface algae. Winter, spring, summer, and fall shade patterns should all be evaluated, and good air circulation, while not quite as critical as with bentgrass greens, should not be overlooked when considering the needs of bermudagrass.

At the present time, two hybrid bermudagrass cultivars are available for use on greens. Tifgreen (Tifton 328), from the research program of Dr. Glenn Burton, was released jointly by the USGA and USDA in 1956. It was a tremendous improvement over the bermudagrasses available at the time and has been used extensively. In 1965, Dr. Burton released Tifdwarf, which was

actually a mutant strain taken from several Tifgreen greens. While Tifgreen has been a very good turfgrass, it is not as well adapted as Tifdwarf for meeting current demands. Primarily, Tifgreen does not tolerate a mowing height below $\frac{3}{16}$ inch for any length of time, especially if other stress factors come into play. Tifdwarf, on the other hand, can tolerate a mowing height below $\frac{3}{16}$ inch on a continuous basis, and its higher shoot density and finer leaf texture make it the best cultivar available for top-quality greens.

That's not to say there are no potential drawbacks with the use of Tifdwarf. Concerns have been expressed about its cold temperature sensitivity, reduced wear tolerance, higher incidence of surface contamination, and resistance to winter overseeding establishment. While it's true that Tifdwarf will go off-color more quickly than Tifgreen when temperatures reach the mid-50s, it actually possesses better winter hardiness and starts to recover from winter dormancy 10 to 11 days earlier than Tifgreen. As far as its wear tolerance and overseeding acceptance are concerned, proper fertilization and improved overseeding methods and materials have eliminated these issues. "Off-type" strains occur in both Tifgreen- and Tifdwarf-based greens, and an annual summertime program of spot removal must be practiced to maintain surface purity. So comparing one to the other, Tifdwarf is the better bermudagrass for producing top-quality putting green surfaces.

The other basic ingredient for success with bermudagrass greens is a capability and willingness for some work. With proper construction and a Tifdwarf base turf, maintaining a dense, healthy turf cover is not that difficult. The big difference between bentgrass and bermudagrass greens is the effort that must be put into grooming the bermudagrass for surface smoothness and speed.

At courses where the best-quality bermudagrass greens are maintained, continuous attention is given to surface grooming programs. This situation requires the standard complement of green management equipment, as well as an array of grooming tools. Among the basic items needed are verticutting units, brush attachments, and a top-dressing application setup that can be calibrated to apply light rates in a timely and efficient manner. Also, adequate time and manpower must be available to carry out the necessary programs.

Grow the Grass First

Unlike maintaining bentgrass greens, where low fertility has been used to maintain fast putting speeds, bermudagrass greens need to be fed. Bermudagrass has a high nitrogen requirement, and the old rule of thumb of using 1 pound N/1000 sq. ft./month during the growing season still applies. When managing a high-sand-content rootzone, maintaining adequate potassium levels is very important. A 1:1 or even 1:2 nitrogen-to-potassium fertilization ratio has been found useful in maintaining healthy turf.

Controlling thatch is another essential management practice for maintaining good bermudagrass greens. Excessive thatch accumulation is a problem inherent in all of the hybrid bermudagrasses. Since most bermudagrass greens are overseeded for the winter months, year-round turf growth occurs on greens. Core aeration and core removal, therefore, are necessary to physically reduce and control organic matter accumulation. A minimum of three corings each summer is required. When bermudagrass greens become two years old, a straight sand top-dressing program is the standard approach for dealing with thatch.

To the average golfer, a lush green turf is a characteristic of the ideal green. To provide this appearance, many superintendents feel forced into watering their greens too much, resulting in a shallow root system and overall weak turf. The bermudagrasses possess good drought tolerance, and less frequent, deeper watering of bermudagrass greens is the best strategy for maintaining a healthy turf and optimum surface conditioning.

Surface Grooming

As noted earlier, bermudagrass requires very intensive surface grooming programs to produce a smooth, true ball roll and a medium-to-fast putting speed. Some of these practices, unfortunately, temporarily disrupt green playability and are an inconvenience to the golfers. When these programs are not carried out on a regular basis, however, problems eventually occur in maintaining the desired level of turf health and green quality. Many older superintendents will tell you that the more you "beat-up" bermudagrass greens, the better they perform.

In late spring or early summer, after the bermudagrass has exhibited sustained active growth, the greens should be severely verticut once or twice. These

severe verticuttings accomplish several things. They aid in reducing thatch that has built up during the fall, winter, and early spring, and they help complete the transition from the winter overseeding cover to the dominant bermudagrass turf cover. Most important of all, severe verticutting stimulates dense, upright, juvenile shoot growth and eliminates grain that has developed.

A self-propelled verticutting/de-thatching unit, such as the Ryan Mat-A-Way, is generally considered the best for accomplishing these severe operations. However, another verticutting unit can do a satisfactory job. The verticutting blades should be adjusted so they only cut into the soil/thatch layer of the upper root zone. Typically, this operation is performed twice at 90-degree angles.

The best results occur when two severe verticuttings are performed in conjunction with the first two corings of the greens. If only one severe verticutting is scheduled, it should be done between the first and second corings of the greens. A tremendous amount of debris is generated from these verticuttings and must be removed.

The typical sequence is to verticut, remove the debris, core aerify, remove

the cores, apply a heavy topdressing, and then work the material into the surface of the greens. For anyone who has never observed severe verticutting of bermudagrass greens, their reaction is that the turf has surely been killed and the greens destroyed. Granted, the end result is not a pretty sight, but within 14 to 21 days the greens will have fully recovered and will provide an excellent putting surface.

In addition to the one or two severe verticuttings, bermudagrass greens require regular, light verticutting through the summer growing season. This program is necessary to maintain upright shoot growth and help prevent excessive thatch accumulation. During periods of active shoot growth, bermudagrass greens should be lightly verticut at least once per month, preferably every 7 to 10 days. A triplex greensmower with verticutting reels installed is the standard unit for accomplishing these light verticuttings. The vertical blades should be set so that they are operating at $\frac{1}{16}$ to $\frac{1}{8}$ inch below the base of the bedknife. When done properly, the average golfer should not be able to tell that anything has been done to the greens by the next day.

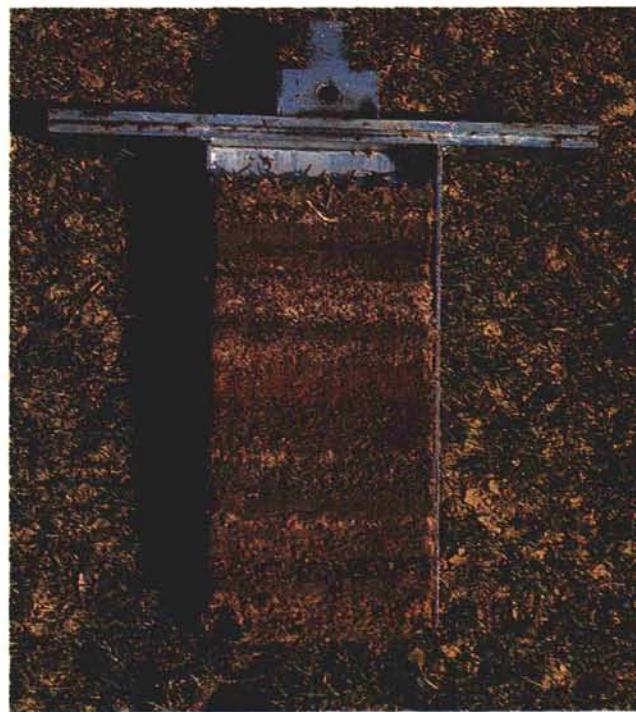
The groomer attachments that are available for most greensmowers are also quite useful in the management of bermudagrass greens. Putting green speed can be increased from 6 to 12 inches with regular use of these attachments. A slightly higher mowing height also can be practiced, thereby reducing the amount of mechanical stress on the turf. Groomers are generally used up to three times per week, and the blades are set to operate at about $\frac{1}{64}$ inch below the effective mowing height of the greens. It must be stressed, however, that use of these groomer attachments does not take the place of a regular light verticutting program. Bermudagrass greens still need to be verticut at least once a month to control thatch accumulation.

Topdressing is another good program for controlling thatch and improving surface smoothness and speed. In addition to heavy topdressing applications made after aerification, regular light applications should be scheduled throughout the year. These "dustings" of 0.1 to 0.3 cubic yards of material per 1,000 sq. ft. help maintain a smooth, true ball roll and good putting speed. Following application, the material should be worked into the surface of

Shade and bermudagrass greens just don't mix!



A poor root zone causes shallow-rooted turf that can't survive pressures from traffic, low mowing heights, and environmental stresses.



the greens with a dragmat or light irrigation.

Application frequency should coincide with the growth rate of the turf so that a homogenous soil profile is maintained. In the summer months, bermudagrass greens usually should be lightly topdressed every two to four weeks. Improvement in playability usually peaks approximately five to seven days after application, a fact that should be kept in mind when planning for special events or tournaments. The importance of using a consistent, high-quality topdressing material with the proper physical characteristics cannot be overemphasized.

A special note for Tifgreen bermudagrass greens: Even though warm-season turfgrasses require temperatures in the mid-80s to 90 degrees for optimum growth, Tifgreen greens can suffer from heat stress. In the mid-to-late summer, when temperatures and humidity can be extreme, heat stress can predispose Tifgreen greens to damage from other stresses such as low cutting height. Under these conditions, Tifgreen greens should not be mowed below $\frac{3}{16}$ inch and should not be verticut intensively. To compensate for the higher cut and the lack of verticutting, superintendents at several Florida golf courses have

successfully improved surface playability by topdressing more frequently. Biweekly or weekly light topdressings during late July, August, and early September is a common regime, though care must be taken to avoid applying too much material.

When consistently fast greens are demanded, there are several other practices that should be considered. The use of walk-behind greensmowers on bermudagrass greens is becoming a popular way of reducing wear and producing a better-quality cut. For the sake of consistency, greens need to be mowed on a daily basis when active growth occurs. Double cutting of the greens represents another excellent strategy for gaining 6 to 12 inches on the Stimpmeter, without reducing the mowing height. In the past, multiple mowings have been practiced just prior to and during the play of special events. To meet the demands of the golfers at some courses, however, double cutting is done on a more regular basis.

Finally, to obtain the best possible speed and smoothness from bermudagrass greens, surface rolling is becoming a more common practice. Both walk-behind and larger rolling units are utilized, offering a few more inches on the Stimpmeter. Due to the additional

manpower required, though, this operation is generally reserved for special events or tournaments.

Conclusion

In no way should this article be interpreted as condoning very fast speeds for all courses with bermudagrass greens. Speed kills! However, television coverage of professional tournaments has convinced golfers that fast greens are the best, and golf course superintendents have to learn to manage these demands within reason. In reality, the main objective should be a smooth, true ball roll and a consistent putting speed through the course.

There is no denying that bentgrass greens are probably better suited for meeting present-day player demands for green conditioning. However, bentgrass greens cannot be maintained in some areas of the country without the clear risk of failure, environmental impacts, and increased cost. In keeping with sound agronomic practices, bermudagrass is the best-adapted turf for greens in the warm, humid regions of the country. With the proper resources and good management, bermudagrass can produce outstanding playing surfaces for regular play and for championship events as well.

A tennis court roller can help produce those last few extra inches in putting speed.

