

BERMUDAGRASS FAIRWAY RENOVATION

Why it is being done and the results that have been achieved.

by JOHN H. FOY

COMMON bermudagrass (*Cynodon dactylon*) is not native to North America. However, since it was introduced as a contaminant in shipping ballast in the early 1700s, it has spread to many locations and has become ubiquitous in the southeastern portion of the United States. Until the first improved hybrid cultivar, Tifgreen, was developed in the 1950s, common bermudagrass was one of the few warm-season turfgrass options for golf courses. Naturally, with the development of today's improved cultivars, many older courses want to convert their greens and fairways to provide golfers conditioning and quality comparable to that found at newer facilities. With bermudagrass putting greens, the renovation or turf conversion procedures have been well established. This is not the case when it comes to fairways, however.

The hybrid cultivar Tifway was released in 1962 and since then has been the standard for fairways as well as roughs and tees. Tifway has a fine texture, dense upright shoot growth, and a dark green color. Also, compared to common bermudagrass, Tifway has improved wear, pest, and cold tolerance. Because of their improved winter hardiness, Vamont and Midiron are two other bermudagrass cultivars that have been used on fairways in the upper South and transition zone. TifSport is the most recent introduction and is similar to Tifway in many respects. However, it possesses improved winter hardiness, can be maintained at lower heights of cut, and, because of stringent production and certification requirements, offers the highest degree of genetic purity. Given the expectations and demands of golfers today, a hybrid bermudagrass turf cover throughout the fairways is essential.

As you might expect, many old courses with common bermudagrass have been undergoing fairway renovation for some time. Also, a rather large number of courses built in the last 20 to 30 years used inferior cultivars or contaminated plant material, and the resulting "Heinz 57" mixture of bermudagrasses makes it impossible to provide the top quality fairway condi-



Providing consistent and acceptable fairway conditioning with common bermudagrass or a mixture of bermudagrass types is a major challenge to turfgrass managers.

tioning expected today. These courses also are undergoing complete renovation. Following is a review of the strategies that have proven to be successful for renovating and converting fairways to new bermudagrass cultivars.

Row Planting

The process of row planting bermudagrass sprigs was developed in the early 1980s and has been used on many courses in the Southeast. This technique is popular for repairing winter damage in the spring and early summer, and has been promoted as a means of making a smooth transition from common or a mixed stand of bermuda to an improved hybrid cultivar with limited course disruption and down time. The basic process consists of:

1. Pre-plant preparations: Approximately two to three weeks prior to the scheduled planting date, core aerate and reduce thatch via other cultural means. This is followed by a pre-plant fertilizer application based on soil test results.

2. Competition reduction: Application of a nonselective herbicide or growth retardant is recommended one week prior to the scheduled planting date. In the early 1980s, paraquat com-

monly was used to burn down existing grasses or weeds to minimize competition for the new sprigs. Today, glyphosate and glufosinate formulations are the most commonly used herbicides. Furthermore, in locations with a history of heavy goosegrass or crabgrass pressure, an application of the pre-emergent herbicide oxadiazon just prior to or immediately following the row planting process is recommended. This treatment is considered safe for bermudagrass sprigs and does not inhibit rooting or turf establishment.

3. Row planting: The equipment for row planting and the process itself were pioneered by Southern Turf Nurseries in southern Georgia and are available today as a sprig planting service from several turf producers. The first row planters for golf course use were tobacco or vegetable planters that were modified to cut in bermudagrass sprigs. Current row planters use two sets of special Colter disks to open 2-inch-deep slits and then press the sprigs down into the slits. A pressure roller on the back of the planter closes the slits and produces good sprig-to-soil contact. The sprig rows are on 6-inch centers, and the standard planting rate is 500 bushels per acre.

4. Grow-in: Grow-in irrigation, fertilization, and cultural practices are essentially the same for bermuda sprigs, regardless of the planting process. Turf producers often suggest grow-in programs, and Green Section regional agronomists also can provide detailed site-specific suggestions.

During the summer, when optimal bermudagrass growing weather is occurring, 60 to 90 days are typically required to establish full turf coverage and appropriate fairway conditioning. Play can resume shortly after the row planting process has been completed, but cart traffic should be kept off the turf until it is well established. For daily-fee operations, row planting is a good option because it minimizes revenue losses.

Total Renovation

A few courses in Florida have conducted total fairway renovation projects in the past several years. In every case of which I am aware, other course improvement projects, such as putting green regrassing or reconstruction, tee leveling and enlargement, irrigation system upgrading, and/or bunker renovation were being conducted at the same time. To some degree, these other projects helped ease the pain of having the course closed for an entire summer. Although there have been

variations in the process of total fairway renovation, the following are common components:

1. Kill the existing turf cover: This is an extremely important step that will be discussed later.

2. Debris disposal: Regardless of the method used to kill the existing turf cover, a large quantity of dead sod and organic debris is created and must be removed. The ideal approach is to use commercial-grade sod cutters and completely strip the existing turf. This material must be buried on site or hauled away. Then, rototilling is conducted to break up and incorporate the remaining thatch and organic debris into the soil. Rototilling does not always fully break up clumps of dead bermudagrass, however, and side delivery rakes have been used to harvest this material into windrows for removal.

3. Soil cultivation: Rototilling with a standard tractor-mounted heavy-grade unit to a depth of 6 to 12 inches has been the standard process. In a couple of cases, large disk harrows have been used in combination with rototilling to thoroughly work the soil. On a couple of jobs, however, large roadbed rototilling units have been used for soil cultivation. In addition to having an increased effective depth of operation in the range of 12 to 18 inches, units such as a Caterpillar SS 250 or a Bomag

MPH 100 are able to produce soil blending that is superior to what is produced with standard tractor rototilling.

Following the soil cultivation work, board floats and box blades are used to reestablish the desired contours and surface smoothing. This also is the appropriate time to apply and incorporate the pre-plant fertilizer and any amendments, such as lime. If soil sterilization with methyl bromide is to be performed, steps 2 and 3 should be conducted first.

4. Sprigging: After a smooth and firm soil surface condition is achieved, standard machine sprigging is performed and the grow-in process is initiated. A sprigging rate of 400 to 600 bushels per acre is recommended. However, for late-season plantings the sprigging rate usually is increased to 800 to 1,000 bushels per acre. It has been my observation that there is no benefit to increasing sprigging rates beyond this range.

As with row planting, and if soil sterilization is not conducted, a pre-emergent herbicide treatment is usually advised just prior to or immediately following the sprigging process. Always specify and use certified planting stock. Over the years there have been many cases of renovation projects that failed because clean and top quality sprigs were not used.



Soil sterilization with methyl bromide prior to replanting fairways ensures the highest degree of bermudagrass kill as well as controlling other pests such as nematodes, mole crickets, and weed seeds.



Where's the '419' bermudagrass?

The West Coast Method

A few courses in California have used a distinctly different approach for converting fairways from common to Tifway bermuda. The basic process consists of stripping off the common bermuda and then installing big roll sod. Generally, half of a fairway is stripped and then resodded lengthwise so that the course can be kept open to play throughout the conversion process. A free drop from the sodded portion of the fairways is allowed until the turf becomes established. A logistical problem with this conversion process is what to do with the common bermuda sod. Hauling it to a dump or landfill can be cost prohibitive. In one case, other locations were found where the sod could be reused, and the contractor charged a few cents per square foot for delivery. Although apparently not an issue at these courses in California, when adequate measures are not taken to completely kill the undesirable grass before replanting, regrowth of the existing bermudagrass has been a major problem for courses in the Southeast and Florida.

Killing Bermudagrass

Regrowth of common or other undesirable bermudagrasses has been a major problem with fairway renovation/turf conversion projects. When row planting operations were first conducted, it was thought that Tifway would be able to out-compete and dominate common bermudagrass. Thus, little effort was put into trying to kill the existing turf cover. It was thought that in as little as two years,

and at least within four or five years, a complete conversion could be accomplished. In the many years I have visited courses where row planting was performed, I have found that, at best, only 50% to 75% of the fairway turf cover was composed of a fine-textured hybrid-type bermuda.

Based on my experiences to date, producing a high degree of kill of the existing bermudagrass turf cover is essential for achieving a successful fairway conversion. There are also examples of where inadequate measures or shortcuts were taken in killing the existing bermudagrass with total renovation projects. In as little as two to three years after renovation, a mixed turf cover of different bermudagrasses can be observed. For golf courses in Florida where the heaviest play occurs during the winter months and the bermuda is not actively growing, a mixed turf cover is a big problem in being able to provide the level of conditioning and aesthetic appeal expected.

Research conducted in 1988 by B. J. Johnson, of the University of Georgia, determined that three applications of glyphosate over the summer growing season are required to produce an acceptable level of bermudagrass control. Acceptable control is defined as 90% or better. As high as 96% control has been achieved, but in some cases 4% survival of the undesirable grasses is considered unacceptable. Also, having to take four months to kill the fairways before starting the replanting process is not an option in most cases.

At several courses in South Florida, the time interval between glyphosate treatments was reduced to 21 days. In

between treatments, aggressive programs were conducted to promote regrowth. So far, it appears that an acceptable level of control was achieved. Yet, a follow-up spot treatment program usually must be used each summer to kill areas of regrowth that are found. Dr. John Boyd, University of Arkansas, also has found that two treatments with a combination of glyphosate plus fluazifop-P-butyl (Flusilade II) produced a level of control equal to three applications of glyphosate.

Soil sterilization with methyl bromide has been a standard practice to kill undesirable grasses prior to replanting bermudagrass greens. Along with providing the highest degree of kill of the remaining bermudagrass, this treatment eradicates most soil-borne pests such as weed seeds, nematodes, and diseases. Sterilizing 20 or more acres of fairway turf is often considered cost-prohibitive. However, it offers the highest degree of kill of undesirable bermudagrass and requires only five to seven days to complete. Thus, there is significant time saving realized, and a course can be reopened to play much more quickly.

Although the practice of sterilizing fairways prior to replanting is gaining acceptance, both the production and use of methyl bromide are being progressively phased out and will no longer be available in 2005. This raises major concerns throughout the bermudagrass industry about being able to establish and maintain monostand plantings. Research is underway, but at this time a viable and equally effective soil sterilization treatment has not been identified.

Conclusion

Unquestionably, the combination of new, better adapted bermudagrass cultivars and ever-increasing golfer demands result in an increased number of fairway renovation projects. Options are available, but several factors must be taken into consideration in determining the best process to use at a particular site. It must be clearly understood that course disruption, cost, and the results achieved will vary greatly from project to project. As with every other aspect of life, communication and education are essential to a successful renovation/conversion program.

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