



*An example of severe surface contamination.*

# Controlling the Battle of Bermudagrass

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**T**HERE'S A BATTLE between bermudagrasses taking place on many greens in the South that most people aren't familiar with. Someone might take for granted that after various bermudagrass strains are planted on greens, fairways, and surrounds, the job is done and there they stay. Once established, however, these grasses begin a long-term competition that results in certain cultivars or strains laying claim to much larger territories than they were originally intended to occupy.

For golfers, the competition doesn't matter so much until inferior or unwanted strains gain a significant foot-

hold on greens. Then, putting green quality and consistency can really suffer.

Golf course superintendents throughout the Sunbelt know how difficult it is to prevent or control bermudagrass encroachment in greens. During the summer months, aggressive rhizome and stolon growth can result in significant lateral spread of hybrid and common bermuda from surrounding areas into existing putting green turf.

Bermudagrass encroachment into bentgrass greens has received a fair amount of attention over the years, and recent research work appears to have developed strategies for minimizing this

problem. Various chemical treatments are used to prevent or suppress bermuda encroachment into bentgrass turf.

The situation is more difficult, however, when one bermudagrass encroaches on another. Such is the case when Tifway (419) bermuda encroaches into Tifdwarf and Tifgreen (328) bermudagrass putting greens. It was originally thought that Tifway encroachment into bermuda greens would not be a problem because it could not tolerate close mowing heights and competition from the putting green quality bermudas. As it turns out, Tifway can survive and spread into





*Tifway encroachment into Tifgreen bermuda green.*

greens maintained at  $\frac{5}{32}$ - to  $\frac{1}{8}$ -inch without much difficulty. In the South Florida area, more than two feet of encroachment can occur in a year's time. Unfortunately, though Tifway bermuda can survive at putting green height, it does not provide an acceptable playing surface, and selective chemical control of one bermudagrass strain that infests another is simply not possible today.

The development of off-type strains in existing bermuda greens is another major problem southern superintendents must deal with over periods of time. The occurrence of these different strains, or mutants, in hybrid bermuda greens was first reported in the early 1960s. Everything from bermudagrass mites, disease activity, and environmental and mechanical stress, to the introduction of material from the outside and genetic mutation of the original turf, was being examined to explain the patches of different grasses. The actual

cause of surface contamination/mutation is still being debated today.

Surface contamination/mutation is a problem because many of these off-type strains vary in texture, growth habit, and tolerance to routine green management practices. As surface contamination increases, it is more and more difficult to maintain consistently good quality appearance and playability. Many of these off-type strains react very poorly to routine verticutting operations, particularly during the mid-to-late summer when environmental stresses build up. Typically, after 30% to 40% of the green surface is contaminated, management practices cannot be adjusted sufficiently to overcome the negative impact of the contaminants.

Winter overseeding of bermuda greens masks the presence of strains that arise from encroachment and surface contamination, but because it is not possible to see the areas of off-type material, spread of these strains occurs

with routine changing of hole locations and the sod plugs. Furthermore, given the trend toward the use of lower overseeding rates and finer-textured overseeding grasses such as *Poa trivialis* and bentgrasses, consistent overseeding results are much more difficult to achieve with highly contaminated putting surfaces.

The problems with fairway bermuda encroachment and surface contamination/mutation of bermudagrass greens in Florida have been so pronounced that the replanting of greens every 10 years has been a common practice. In some cases it has been necessary to regrass greens in six to eight years. These expectations have made it even more difficult to justify the long-term benefits of proper putting green construction techniques.

The cost of reestablishing a monostand turf cover (a minimum of \$40,000 to \$60,000 to replant 18 greens) and the inconveniences that must be tolerated



by the membership when it is necessary to close a course for three or four months surely justify efforts to prevent and control encroachment and contamination problems before they become unmanageable. Following is a review of various practices that can be utilized to accomplish this objective.

### **Planting Strategies**

At the time of planting or regrassing of bermudagrass greens, soil sterilization and planting operations should be extended a minimum of 10 to 15 feet beyond the putting surface proper. This practice creates a buffer strip that significantly reduces the rate of encroachment of fairway bermudagrass into the green surface. This planting scheme can also reduce the amount of

foreign material tracked into the putting surfaces by golfers and equipment.

A variation on this planting strategy being tried on a few courses in South Florida involves establishing a buffer strip between the putting surface and the fairway bermudagrasses using different turf selections. It is generally accepted that Tifdwarf is the best adapted hybrid bermudagrass available for use on putting greens in Florida. Unfortunately, the less-aggressive growth habit of Tifdwarf makes it more susceptible to encroachment problems. On the other hand, Tifgreen bermuda produces a more consistent surface at higher heights and can compete better against invasion from Tifway. Thus, these courses are using Tifgreen bermuda to create a buffer strip between their putting green and fairway ber-

mudas. The width of the buffer strip varies from a couple of yards to the entire green surround. To date, satisfactory results have been experienced. Earlier attempts using zoysiagrass in similar buffer strip plantings did not work well.

### **Mechanical and Chemical Control**

Maintaining a band of separation 4 to 6 inches wide between greens and surrounds with glyphosate would probably work quite well, but it would hardly be acceptable to most golfers. However, non-selective chemical control of encroachment and surface contamination is strongly recommended during the establishment of new or renovated greens. During this time, when a dense turf cover is not present, fairway ber-

*A replanted green being chemically edged.*





mudagrasses are quickly able to encroach into greens. Maintaining a band of separation with glyphosate, therefore, should be a standard practice when establishing bermuda greens. Furthermore, during the grow-in stage, chemically roguing any off-type strains detected in the putting surfaces will help insure the purity of the base turf.

When bentgrass greens were first established in the South, it was recommended that a thin-bladed edger be used around the perimeter of the greens, followed by a band application of siduron. This program was conducted each spring and fall to help control encroachment. It was also found that mechanical edgings during the summer months, in conjunction with hand pulling of bermuda runners, was of great benefit.

While applications of siduron, or other selective herbicides, are not effective with bermuda greens, mechanical edging has a place. Ideally, the same grass used for the greens should be established on the collars. Mechanically edging the outside perimeter of the collars once or twice per month during

active growth and hand pulling any runners that have encroached are definitely worthwhile.

### Barrier Materials

Through the years a variety of permanent barrier materials have been installed around greens to physically inhibit bermudagrass encroachment. These materials have run the gamut from plastic and galvanized steel edging to concrete walls buried below the soil surface. One of the problems with this approach to encroachment control was highlighted at this year's PGA Championship at Shoal Creek Country Club in Birmingham, Alabama. One competitor's approach shot hit the barrier material and careened widely away from the green. While the probability of this occurring on a regular basis is low, the negative impact on course playability and appearance cannot be overlooked.

Recently, two new plastic barrier materials have been introduced. Because both of these barriers were specifically developed to combat

encroachment problems, their benefits and acceptance will undoubtedly be better. A key to success with both of these barriers, however, is following through with an edging program on a regular basis. Several courses that have installed these barriers are reporting satisfactory results.

### Contamination Removal and Replacement

The previously described strategies were directed toward preventing encroachment of fairway bermuda into collar and putting green surfaces. What about putting surface contamination/mutation control? At this time, the only good approach is a program of spot removal and replacement.

All of the greens should be closely examined during the summer months and off-type selections should be identified. These areas should then be treated with two or three applications of glyphosate on a seven-day schedule. The dead turf can then be cut or plugged out, and clean sod can be installed. The appearance and playability of the areas being worked on is unquestionably affected, but this is an acceptable consequence for the sake of maintaining surface purity and extending the life expectancy of the greens. Furthermore, even when a good encroachment control program is practiced, a similar spot removal program through collar areas will be required from time to time. To practice an effective and economical spot removal program, a good turf nursery must be available as a source of replacement material.

Some may question whether the effort to prevent and control encroachment and surface contamination is justifiable. The best argument for establishing and maintaining an aggressive control program is that surface purity can be maintained for 25 years or longer. There is a course located on the lower southeast coast of Florida where the superintendent has actively pursued controlling surface contamination. The greens on this course are as clean as any newly planted green.

In the future, research work may provide alternative control strategies, such as genetic tolerance to herbicides within similar turf varieties, so that selective control is possible. Until that day comes, however, diligence and the application of regular control programs will be necessary to maintain a pure stand of grass on bermuda putting greens.

*Encroachment barriers and mechanical barriers.*

