



Overseeding with bentgrass is common practice on most northern championship courses. The second hole at Merion Golf Course — site of the 1981 Open Championship.

Bentgrass Fairways . . . Why Not?

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FAIRWAYS COMPRISE the largest acreage that require maintenance at golf courses. In many areas of the transition and cool, humid zone of the United States, creeping bentgrass (*Agrostis palustris* Huds.) and Colonial bentgrass (*Agrostis tenuis* Sibth.) could be maintained as the principal fairway grass species. However, other turfgrasses in this area, including Kentucky bluegrass, perennial ryegrass, especially *Poa annua*, predominate. Without doubt, bentgrass, where managed correctly, provides some of the best fairways in its area of adaptation. Many of the most famous clubs in the Northeast, such as Baltusrol

Golf Club, Springfield, N.J., Winged Foot Golf Club, Mamaroneck, N.Y., and Merion Golf Club, Ardmore, Pa., have chosen bentgrass for their fairways. Our technology and ability to grow bentgrass is certainly not lacking, so what are the problems?

Over-Irrigation

Perhaps no grass has been so mismanaged by irrigation practices as bentgrass. It ranks favorably but slightly behind Kentucky bluegrass and the fine fescues in drought tolerance. Bentgrasses are widely used in Scotland, where there is no artificial irrigation. The bentgrasses have also been found growing in

desert areas. Yet somehow bentgrasses have the reputation of needing much more water than other permanent turfgrasses.

Before irrigating, it is good practice to use a soil probe to examine the moisture status of the soil. There should always be moisture enough in the rootzone to supply the plant's needs. When water is needed, only enough should be applied to restore the supply to the rootzone. Care must be taken not to irrigate to the point where macropores become saturated, since this interferes with oxygen supply, and grass roots will not function without oxygen. Wilt- ing of the turf occurs when air is cut off



*Golf carts cause damage when turf is under stress, then *Poa annua* gains a foothold.*

from the plant. Unfortunately, the natural tendency is to put on a little more rather than a little less. We have learned the concept that turf roots require water, but we have a more difficult time learning that overwatering greatly reduces soil air and causes grasses to wilt.

***Poa Annua* Problem**

The major criticism of bentgrass fairways is related to the *Poa annua* problem. Is this criticism justified? Fairway irrigation has contributed to the problem, along with increased soil compaction and turfgrass wear injury caused by golf carts. Forgotten is the fact that many fairways were originally dominated by common Kentucky bluegrass and the fine-leaved fescues. These unirrigated grasses produced a good lie but not the tight lie preferred now by golfers. When the bluegrasses and fescues were irrigated, golfers demanded that the golf course superintendent lower the cut. With the lower cutting height and irrigation, *Poa annua* quickly invaded the Kentucky bluegrass and red fescue. This is the primary cause of the high predominance of annual bluegrass fairways. It should be noted that

Fairway lies excel on well-managed bentgrasses.



the annual bluegrass had much more difficulty invading the bentgrass. The bentgrasses are able to withstand the lower cut and, so long as it was applied at reasonable rates, the extra water.

Presently, the increased soil compaction and traffic injury from maintenance equipment, golfers, and particularly golf carts have greatly encouraged *Poa annua* in our present bentgrass fairways. Frequent over-irrigation also contributes to soil compaction and the extra moisture necessary for *Poa annua* germination. The bentgrasses are not as competitive with *Poa annua* on compacted soils.

Also important to a bentgrass program is the judicious use of fertilizer. Bentgrass fairways require minimal amounts of nitrogen, and the preferred program is to fertilize lightly but more frequently. This provides a slow, steady growth of the bentgrasses. High rates of nitrogen, particularly in late winter and early spring, encourage *Poa annua*. Higher nitrogen levels also increase the water requirements of the grasses. Applications of phosphorus to bentgrass fairways should be carefully considered because high soil phosphorus also encourages *Poa annua*. Most soils

in the United States contain adequate soil phosphorus levels, except areas in the southeastern states where weathering intensity is relatively high.

Sulfur fertilization has recently proven to be very beneficial to bentgrass turf. Dr. Roy Goss of Washington State University has been working with a *Poa annua* control program using sulfur as the key element to the program. Several clubs in the Mid-Atlantic Region have been applying sulfur to bentgrass fairways with good results. Sulfur materials available are elemental sulfur, ammonium sulfate, potassium sulfate, gypsum, and ferrous sulfate. Bentgrass fairways must receive proper cultural and mechanical maintenance practices to compete successfully with *Poa annua*. Soil tests should be taken periodically on bentgrass fairways to determine nutritional needs. Bentgrasses prefer a soil pH around 5.5. A higher pH in the fairway soils will favor *Poa annua*.

Too Expensive

Many people do not consider bentgrass for a fairway turf because they feel maintenance will be more expensive than for a Kentucky bluegrass or perennial ryegrass turf. Others equate the high cost of maintaining a bentgrass putting green with a bentgrass fairway. In reality, bentgrasses will provide an excellent fairway playing surface at only slightly higher maintenance standards than Kentucky bluegrass or perennial ryegrass. A comparison of management practices will help demonstrate the differences in bentgrass and Kentucky bluegrass/perennial ryegrass fairways.

1. The biggest difference in management will be the height of cut. Bentgrass fairways are cut between $\frac{1}{2}$ and $\frac{3}{8}$ inch, while Kentucky bluegrass/perennial ryegrass fairways are cut between $\frac{3}{4}$ and 1 inch. Best playing conditions are obtained on cool-season fairways by frequent mowing. However, Kentucky bluegrasses require more frequent mowing than the bentgrasses. The lower cutting height of the bentgrasses not only can produce better playing conditions, but also deters *Poa annua*. *Poa annua* is most competitive at $\frac{3}{4}$ to 1 inch.

2. The bentgrasses require more water during the summer months because they become very short-rooted during July and August. Frequent light waterings may be necessary during these months. Kentucky bluegrass and perennial ryegrass are more deeply rooted; therefore, light, frequent waterings to these species during the summer may reduce the root systems and produce a more tender plant.

3. Disease control programs are needed for all grasses. The best disease control program, however, is a sound cultural program using minimal fertilizer and water, proper mowing and thatch control. The peak disease period for bentgrasses, bluegrasses, and ryegrasses will be during July and August when heat and humidity are high. Normally, depending on weather conditions and the fungicide selected, a 7- to 21-day spray interval is followed in fairways in the late spring, summer and early fall.

4. The bentgrasses are also surprisingly heat tolerant. This is a characteristic usually overlooked. Bentgrass greens are present in areas of the deep south, and bentgrass tees are common in the southern limit of the transition zone on modified soil mixes. It is possible to grow bentgrass fairways further south than is currently practiced, if soils are well-drained.

5. The wear tolerance of bentgrass is poor compared to Kentucky bluegrass and perennial ryegrass. Perennial ryegrass is the most wear tolerant of the cool-season grasses. Traffic control, particularly if golf carts are present, is mandatory to reduce wear on bentgrass fairways.

6. The bentgrasses are the most weed free of the cool-season turfgrasses. However, they are more susceptible to injury from herbicides, particularly pre-emergent and hormone-type chemicals. Clover, particularly on imperfectly drained, fine-textured soils, is the biggest problem. Kentucky bluegrass and perennial ryegrass have a higher tolerance to most herbicides.

The Future

Hopefully, the criticisms that bentgrass fairways are too expensive to maintain and are too subject to *Poa annua* invasion will be less in the future. Additionally, many managers may select bentgrass for areas previously considered too risky during the summer.

Intensive breeding work will one day produce bentgrasses with greater heat- and drought-tolerance. Wouldn't it be wonderful to have a bentgrass with the rooting characteristics of Kentucky bluegrass? Through breeding, we may one day have rhizomatous Colonial bentgrasses. This feature together with greater wear tolerance would significantly increase bentgrass use on golf courses throughout the country. The future for better bentgrass fairways through research now appears more promising than ever before.



Brian Silva Joins the Green Section Northeastern Region Staff

Brian M. Silva, Agronomist, has been appointed to the USGA Green Section staff. A native of Framingham, Massachusetts, Silva received his undergraduate and graduate training in turfgrass management at the University of Massachusetts. Immediately prior to joining the Green Section staff, he served as an instructor in the School of Golf Course Operations, Lake City College, Lake City, Florida. He brings considerable practical experience to his new position.