Grasses

BY H. B. MUSSER
Professor of Agronomy, The Pennsylvania State University

The choice of a grass for any specific locality or specialized use on the golf course, whether greens, fairways, tees, or roughs, must be based first on its climatic adaptation.

Bluegrasses, fescues, and bents, are essentially temperate climate grasses that grow best under moderate temperatures and good moisture. Grasses such as Bermudas, Zoysias, St. Augustine, carpet and Centipede require much higher average temperatures with about the same moisture levels. In contrast, species such as buffalo, the gramagrasses, and wheatgrasses, will survive under a wide range of temperatures and thrive at moisture levels much lower than those required by the first two groups.

The farther any grass is moved from its region of best adaptation the more difficult it is to establish and maintain good quality turf of it. The high proportion of unsuccessful attempts to hold good bentgrass putting greens in the South and the many failures to consistently use Bermuda north of the Mason-Dixon line testify to this.

Grasses also have specific soil adaptations. There are basic differences in their tolerance to soil acidity, their drainage requirements and fertility responses. Bluegrasses and Bermudas need sweet soil. Bents and fescues have a wide tolerence to soil reaction. Centipedegrass seems actually to prefer an acid condition. There are similar differences in fertility requirements. Bents, Bermudas and certainly the better types of bluegrasses require materially higher fertility levels than slower growing types such as fescues and zoysias.

The third, and equally important, grass characteristics which must be understood are differences in adaptation to specific uses and management. This covers all their natural variations in growth habit, texture and density, toughness and resistance to wear, disease susceptibility and general vigor. All of these things have a direct bearing on their ability to persist and provide good quality turf under the type of treatment required to meet the demands of special uses. As an illustration, the cutting height limitations of Kentucky bluegrass and red fescue are well recognized. They cannot continue to produce satisfactory turf on fairways where one-half to three-quarters inch cutting is demanded. Bents and Bermudas thrive under this treatment and we use them on putting greens because of their ability to produce the required quality of turf with such management.

These basic differences among grass species frequently extend to varieties within a single species. Critical observation and testing has provided us with a reasonably good picture of the potentialities of many of these varieties.

In the Kentucky bluegrass, species of seed of Merion, Delta, Park, Troy, Arboretum and Newport is commercially available. Where bluegrass is to be used on fairways and a choice must be made among these, the practical question of basic differences in their characteristics and performance possibilities immediately arises. It is essential to know whether these differences are great enough to be of practical importance. No one is going to use Merion because it is more expensive, on the principle that what costs more should be better. We use it because Merion has shown, repeatedly, that it is more dependable in areas where the leaf spot disease causes chronic injury.

We find the same variations among varieties of Bermudagrass. U-3 Bermuda, one of the first improved types of this species, is an excellent fairway and tee grass in the cooler sections of the general region of Bermuda adaptation. As we move it further south it becomes more

and more mediocre due to lack of disease resistance. The newer Tifgreen variety is also a good example. Its superior ability to produce an even, fine-textured turf on putting greens is fast making it a favorite for this purpose.

Varietal differences in the bentgrasses are equally pronounced. The situation here is somewhat more complicated in that the first decision to be made is whether to use a variety that may be seeded, or a vegetatively propagated variety. It is quite generally recognized that vegetative plantings will usually produce a usable turf quicker than seedings. On the other hand, success in producing the best possible quality with vegetative varieties is contingent upon a very definite understanding of the characteristics and limitations of each. These varieties are vegetative multiplications of a single plant. Any basic weakness, such as disease susceptibility, a tendency toward graininess and stemminess, or poor humidity tolerance, will be perpetuated and will show up strongly whenever such conditions are encountered.

Most of the seeded bents, such as Seaside, Astoria, Highland, or just ordinary colonial, are composed of a large number of individual types, some of which are good and some poor. Since no effort has been made to breed out the weak sisters, the turf produced by any of them is a composite and represents the average for the species.

The only other seeded variety of bentgrass available commercially at the present time is Penncross. It is the result of an attempt to concentrate desirable qualities and eliminate weaknesses by controlled breeding. The large number of favorable performance reports on it, over a very wide range of conditions, shows that this approach has been at least partially successful. There seems little doubt that it will outperform any other seeded bent presently available and that it has a materially wider range of adaptability than individual vegetative strains.

A specialized knowledge of the grasses is, of course, not the only thing necessary to insure good quality turf. Good methods of establishment are just as important. These begin with proper construction and tillage. A green that is built without provision for adequate air and water movement through the soil will be a constant problem. Fairways that are seeded without thorough soil loosening or where reaction and fertility requirements have not been met cannot develop the kind of playing turf the golfer demands.

Planting methods, also, can make a material difference. Where grasses are used that must be established vegetatively by sprigging or stolonizing, it is essential that healthy, vigorous planting stock be used, at a rate that will produce a good cover quickly. The seed bed not only must be well prepared, but soil moisture must be maintained at a level favorable for growth. Where mechanical planters are used the spacing and depth of planting become very important considerations. The proper vegetative planting of greens is just as specialized. A firm seed bed, good spreading technique, the right top dressing mixture and its uniform distribution at the right rate are essential to good establishment.

Where seed is used it must be understood that a longer period is required for it to become sufficiently mature for safe use. Here, again, good methods are vital. Good soil conditioning, seed bed preparation, the use of high quality seed, uniform distribution at the proper rate, the right covering depth, proper firming by rolling and protection of danger areas by mulching, all have a direct and pronounced effect on the completeness of establishment and the rate of turf development.

It is equally important to know how to handle the new grass after it has started to grow; when to start cutting, at what height and how often, how soon should fertilizer be used, when and how much water should be used. Unless we have the right answers to such questions, we can get into very serious difficulties.

These are some of the more important things vital to good turf establishment. Add to them all the specialized information necessary to day-to-day and season-to-season maintenance and you have the normal stock-in-trade of the competent superintendent.

* * *

The afternoon session was devoted to the topic, Factors Pertaining to Design, Financing and Timeliness in the Rebuilding Operation. The talks will be summarized in the next issue.