Winter overseeding: the ideal turfgrass variety

An evaluation of various cool season grasses and grass mixtures in overseeding a Tifgreen bermudagrass golf green. W. G. Menn and G. G. McBee. 1971. Texas A & M University Progress Report Pr-2878. pp. 1-16. (from the Department of Soil and Crop Sciences, Texas A & M University, College Station, Tex. 77843).

The objective of this study was to evaluate the individual cool season grasses and grass mixtures available for use in the winter overseeding of bermudagrass golf greens. The study involved two experiments conducted on an established Tifgreen bermudagrass putting green located at Texas A & M University. The specific overseeding dates were October 30, 1968, and October 20, 1969.

The overseeding operation involved vertical mowing in two directions prior to seeding, uniform distribution of the seed over the plot area and then working the seed into the bermudagrass sod by vertical tapping with a stiff bristle brush. The area was then topdressed with approximately 0.25 inch of soil mix. After topdressing, the plots were rolled and kept moist until emergence of all grasses was achieved.

The cultural practices following emergence involved an initial mowing height of 0.5 inch that was gradually lowered to 0.25 inch with a subsequent mowing frequency of twice a week. The entire experimental area was fertilized with 12-12-12 at a rate of 1.5 pounds each of actual nitrogen, phosphoric acid and potash per 1,000 square feet. Subsequently, monthly fertilizations were made using ammonium nitrate applied at a rate of one pound of actual nitrogen per 1,000 square feet. Preventive fungicide applications were made at 10 to 14 day intervals on all plots. The specific fungicide used was alternated to provide a broader effective range of disease control.

The experimental layout consisted of a randomized block design with four and three reps in 1968 and 1969, respectively. The plot size was six square feet during the first year's test and 16 square feet for the second experiment. Approximately 70 cool season turfgrasses and turfgrass mixtures were evaluated, including (a) 19 Kentucky bluegrasses, (b) five other bluegrass species, including *Poa trivalis*, (c) seven bentgrasses, including creeping, colo-

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nial and velvet species, (d) three meadow fescues, (e) 10 red and chewing fescues, (f) 14 perennial and annual ryegrasses and (g) 11 cool season turfgrass mixtures. Data collected during the studies included rate of seedling emergence, leaf texture, color, uniformity of the putting green surface, spring transition to warm season species, fall transition to cool season species and competitive ability with annual bluegrass.

The over-all performance of individual cool season turfgrass species and varieties during the two-year study is summarized as follows.

The Kentucky bluegrasses, as a group, were the slowest in seedling emergence, were medium in leaf texture, had a predominately medium to dark green color, formed an above average putting surface, ranked well above average in spring transition to the warm season species and demonstrated below average competitive ability with annual bluegrass. Individual Kentucky bluegrass varieties ranking highest in performance were Merion, Nugget, Pennstar, Primo, Windsor, BA56-1, BA61-91 and BA62-54. The order of these eight varieties is significant. Among the other bluegrass species *Poa trivalis* was best suited for use in overseeding whereas *Poa ampala, Poa compressa* and *Poa nemoralis* were generally inferior.

The bentgrasses were characterized by earlier and more uniform seedling emergence than the bluegrasses. They had a fine to medium fine leaf texture, light to medium green color, average in putting green surface quality and good in spring transition to warm season species. Their competitive ability with annual bluegrass was relatively poor. The best bentgrasses in these evaluations were two creeping bentgrasses, Penncross and Seaside.

The red and chewings fescues had a seedling emergence rate comparable to the bentgrasses and also had a more uniform stand. They were characterized by a fine leaf texture, light to medium green color and had fairly good spring transition to warm season species. The better varieties had an exceptionally good quality putting green surface and approximately half of them demonstrated fairly good competitive ability with annual bluegrass whereas the others were very poor. Those varieties showing the most promise for winter overseeding included Golfrood, Highlight, Jamestown, N6-13 and Pennlawn. In comparison to the other species in this test the meadow fescues were generally poor in performance throughout all phases of the experimental investigations.

The ryegrasses were characterized by the earliest and most uniform seedling emergence of all species evaluated. The leaf texture was medium coarse to coarse and the color ranged from light to dark green depending on the variety. The putting surface ranked well above average in uniformity and quality, but the spring transition to warm season species was rather poor. The competitive ability with annual bluegrass was exceptionally high compared to the other species utilized. The ryegrass varieties ranking best in the overseeding performance experiments included Manhattan, Pennfine, K9-123, K9-124, K9-125 and S321. A perennial ryegrass blend containing a combina-

tion of NK-100 and Pelo also ranked high.

Mixtures of the cool season turfgrass species usually ranked superior to any monostand of a single species in terms of the earliness of seedling emergence and uniformity of emergence. The leaf textures ranged from coarse to fine and from light to medium to yellowish green depending on the combination of species and varieties included in the mixture. The quality of the putting surface generally rated high as did the spring transition to warm season species, although certain mixtures did lack adequate transition qualities. The competitive ability with annual bluegrass generally ranked quite good.

Comments: The winter overseeding of cool season turfgrasses into bermudagrass putting greens that enter winter dormancy (stop growth and loose their color) is frequently practiced. The ultimate turfgrass variety for use in overseeding should possess the following characteristics: (a) good spring transition to the warm season turfgrass species, (b) good fall transition from warm season to cool season turfgrass species, (c) rapid seedling emergence, (d) good winter color under low temperature stress, (e) capability of forming a high quality dense, uniform putting green surface, (f) resistance to the common winter turfgrass diseases, particularly *Pythium*, (g) relatively low seed cost, and (h) good tolerance to intense traffic. To date there is no turfgrass variety available that meets all of these criteria to an acceptable degree. For this reason most winter overseeding practices involve the use of a mixture of cool season species in order to provide a broader genetic base that more closely meets the above criteria. The most commonly used overseeding mixtures contain two to four cool season turfgrass species selected from among the bentgrass, red fescue, ryegrass, rough bluegrass and Kentucky bluegrass species.

In reviewing the above article concerning the performance of various turfgrass species, it should be remembered that this has been conducted under the environmental conditions at College Station. A general summary of the winter overseeding research published to date indicates that the performance and relative rankings of individual species varies from region to region throughout the United States.

At the seedling emergence stage it is important that a preventive fungicide program be adopted to avoid loss of stand due to seedling diseases such as *Pythium*. This is usually a more severe problem on greens maintained at higher nitrogen and moisture levels. Thus a fungicide application should usually be made immediately at intervals, depending on the conditions and problems that arise

The proper timing of overseeding operations is important. Overseeding should be done late enough in the fall that bermudagrass growth is slowed by low temperatures so that an excessive degree of competition with the overseeded cool season turfgrass seedlings will not occur. However, the overseeding should not be so late that soil temperatures are below the optimum range for germination of the cool season species, thus resulting in an inferior stand. Higher seeding rates are commonly used for winter overseeding because of a higher seedling mortality rate. □