

## Cultivar Evaluation

Several turfgrass researchers received funding to cooperate with USGA/GCSAA supported breeding projects. The purpose of these studies was to evaluate the adaptation and performance of the experimental varieties as they became available from the various turf breeding programs. As one can imagine, results from these studies produced interesting surprises and some disappointments. The data collected from these turfgrass evaluation trials were used by many of the breeders in their selection decisions and release documentation.

## Management

*University of Nebraska - Dr. Robert C. Shearman*

### *Cultural Practice Interactions on Golf Course Turf*

Several research projects were initiated and completed which evaluated the direct and interacting effects of two or more cultural practices (i.e., watering, fertilizing, cultivating, and mowing). A greenhouse hydroponic technique for making relative nutritional comparisons and screening turfgrass selections was developed. Irrigation and potassium treatments were combined to determine the effects of Kentucky bluegrass fairway turf exposed to traffic.

In addition, fairway management studies determined the effects of irrigation frequency, clipping removal or return, nitrogen nutrition, and traffic on 'Pennncross' creeping bentgrass competition with annual bluegrass and fairway quality. Fairway playing conditions improved with reduced irrigation, clipping removal, reduced nitrogen, and lower traffic. Annual bluegrass encroachment increased with nitrogen rate.

The effects of vertical mowing frequency and mowing height on putting green speed, rooting, and stress resistance also were determined. Vertical mowing had no effect on ball roll, color, canopy reflectance, or root production. As expected, ball roll decreased 0.2 to 0.4 m (8 to 16 inches) when mowing heights were raised from 3.2 mm (0.125 or 1/8 inches) to 4.8 mm (0.189 or 3/16 inches). Canopy temperatures also decreased when mowing heights were raised. Color, quality, vegetation index, and root production all increased significantly when mowing heights were raised 1.6 mm (1/16 inches).

*Michigan State University - Dr. Bruce E. Brunham*

### *The Effect of Seven Management Factors and Their Interaction on the Competitive Ability of Annual Bluegrass and Bentgrass*

Research was conducted for a three year period on the competition between annual bluegrass and creeping bentgrass under fairway conditions. Five management factors were investigated, including irrigation (100 percent of open pan evaporation three times per week, 75 percent of open pan evaporation applied daily, and irrigation at severe wilt); clippings removed or returned; nitrogen fertility (2 lbs. nitrogen per 1000 square feet annually or 6 lbs. nitrogen per 1000 square feet annually); plant growth regulator treatment (Embark at 1/8 lbs. product per acre, Cutless at 1.0 lbs. product per acre and a control); and overseeding with 'Pennncross' creeping bentgrass or no overseeding.

Results showed that only clipping treatments, plant growth regulators, and the initial annual bluegrass population had a significant effect over all three years. Nitrogen fertility was significant in only one of the three years. The plant growth regulator treatment was not significant in any one year, but was significant when data were analyzed over all three years.

Over the three years of the study, clipping-removed plots had 12 percent more creeping bentgrass than clipping-returned plots when averaged over all treatments. Clipping-removed plots were found to contain 60 percent less viable annual bluegrass seed than clipping-returned plots, possibly a reason for the increase in creeping bentgrass. Thus, returning clippings is a passive form of annual bluegrass overseeding.

A very interesting interaction between nitrogen fertility and plant growth regulator treatment occurred when the data was combined over three years. At low nitrogen fertility (2 lbs. nitrogen per 1000 square feet annually), there was no difference in annual bluegrass populations whether treated with Embark, Cutless, or no plant growth regulator. However, under high nitrogen fertility (6 lbs. nitrogen per 1000 square feet annually), plots treated with Embark had significantly more annual bluegrass than plots treated with Cutless or not treated. Thus, it appeared from this study that Embark actually favored annual bluegrass under high nitrogen conditions, while under no conditions was Cutless found to favor either annual bluegrass or creeping bentgrass when compared to plots receiving no plant growth regulator.