

THE EFFECT OF SEVEN MANAGEMENT FACTORS AND THEIR INTERACTION  
ON THE COMPETITIVE ABILITY OF ANNUAL BLUEGRASS AND BENTGRASS

MICHIGAN STATE UNIVERSITY  
East Lansing, Michigan

Dr. Bruce Branham  
Principal Investigator

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Research was conducted for a three year period on the competition between annual bluegrass and creeping bentgrass under fairway conditions. Previous progress reports have detailed conclusions from only one or two years' data. This represents a final summary of the results of this field study.

Five management factors were investigated and included irrigation (110% of open pan evaporation (OPE) three times per week, 75% of OPE applied daily, and irrigation at severe wilt); clippings removed or returned; nitrogen fertility (Two pounds nitrogen per 1000 square feet per year or six pounds nitrogen per 1000 square feet per year; plant growth regulator (PGR) treatment (Embark at 1/8 pounds per acre, Cutless at 1.0 pounds per acre and a control); and overseeding with "Penncross" 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 out of the three years. Plant growth regulator treatment was not significant in any one year but was significant when data was analyzed over all three years. Over three years, clipping-removed plots had 12 percent more creeping bentgrass than clipping-returned plots when averaged over all treatments. Plots treated with mefluidide had significantly more annual bluegrass than plots treated with Cutless or receiving no treatment. Lowered nitrogen fertility caused a decrease in annual bluegrass in only one out of the three years of testing and was not a significant factor when data were combined over all three years. The decrease from low nitrogen fertility occurred in 1985, a year characterized by low natural precipitation. We concluded that low nitrogen fertility is effective when rainfall is low implying that heavier rains may minimize the difference between high and low nitrogen fertility.

A very interesting interaction between nitrogen fertility and plant growth regulator treatment was significant when the data was combined over three years. At low nitrogen fertility (Two pounds nitrogen per 1000 square feet per year), there was no difference in annual bluegrass populations whether treated with Embark, Cutless, or no plant growth regulator. However, under high nitrogen fertility (six pounds nitrogen per 1000 square feet per year), plots treated with Embark had significantly more annual bluegrass than plots treated with Cutless or not treated. Thus, Embark actually favors annual bluegrass when 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.

Clipping-removed plots were found to contain 60% less viable annual bluegrass seed than clipping-returned plots. We concluded that this difference was the primary reason why clipping removal favors creeping bentgrass. Returning clippings is a passive form of annual bluegrass overseeding.

Clipping removal significantly lowered soil potassium levels when compared to clippings-returned plots.