EFFECTS OF POTASSIUM ON WEAR TOLERANCE OF TURFGRASSES

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A study was begun at the Hancock Turfgrass Research Center, Michigan State University, in 1989 to investigate the long term effects of annual potassium applications on wear tolerance in kentucky bluegrass, tall fescue, and perennial ryegrass turfs. Five K levels (0, 4, 8, 12 lbs/1000 ft^2/year, and K based on soil test recommendation) and four replications were used on separate test areas of 'Baron' Kentucky bluegrass, 'Rebel' tall fescue, and 'Manhattan' perennial ryegrass. The applications were made in 1989, 1990, and 1991 at a rate of 2.0 lbs K/1000 ft^2 on a three week interval beginning June 1 and ending September 15.

1991 wear traffic was initiated on May 15 using the Brinkman Traffic Simulator, BTS. The BTS was developed by researchers at the University of California-Riverside to simulate the wear action of athletic cleats from sports such as football and soccer. The device is made of two hollow steel drums 15" in diameter and 42" wide. There are nuts and bolts attached perpendicular to the drums such that they protrude out to simulate cleats. The drums are filled with water for a total weight of 860 lbs. Data from these researchers show that two passes with the BTS equal the amount of wear on a field at the 40 yardline of one football game. The turf was subjected to three passes twice/week from May 15 to July 1.

Soil tests were taken from the areas in October 1991. Analysis was performed on soil pH, P, K, Ca, Mg, Zn, and Mn. Only K-soil levels were significant due to treatment applications (Table 1). In addition, at the end of the wear treatments the plots were rated for percent preferred species remaining. These density percentages are also presented in Table 1. K-soil levels increased with increasing K fertility applications, but there was significant differences from the control only at the high rate (12 lbs K_2O/1000 ft^2/year). Although not statistically significant, percent preferred species after wear treatments is lowest on the high K treatment for two species (perennial ryegrass and Kentucky bluegrass). This study will be continued in 1992 as tissue analysis will be incorporated into the study.

Table 1. The effect of potassium on soil K levels and turf density following wear treatments, Michigan State University, 1991.

	K levels (ppm)			Turf Density[1]		
K_2O (lbs K_2O/1000ft^2/year)	P. Rye	K. Blue	T. Fescue	P. Rye	K. Blue	T. Fescue
Soil Test[2]	234	230	262	33	25	73
4	276	324	248	38	20	73
8	364	550	338	35	25	73
12	782	904	730	21	15	75
Check	198	230	236	28	17	76
LSD (0.05)	128	304	148	NS	NS	NS

[1]Density scale 0-100; taken at the end of wear treatments with Brinkman Traffic Simulator; Represents percent desired species present.

[2]K recommendations for 1991 were 2 lbs/1000ft^2, 0 lbs/1000ft^2 and 0 lbs/1000 ft^2 for perennial ryegrass, Kentucky bluegrass, and tall fescue respectively.