Soil pH control study

The soil pH control study was initiated in 1981 on sandy loam soil. Soil pH values for 1982 and 1983 are given in Table 7. Of particular interest is the marked increase in pH of the 0-2 inch depth between 1982 and 1983 for plots which were acid in 1982. The higher sulfur plots increased from pH 3.4 to 4.3; the lower sulfur treatment increased from 4.1 to 4.8 and the untreated check increased from 6.0 to 6.4. This was likely caused by the free lime in the irrigation water. An increase in pH is frequently observed where the turf is irrigated regularly with water drawn from a limestone acquifer. We have seen this previously on other plots.

The effects of pH modification on available nutrient soil tests are given in Table 8. Acidifying the soil increased phosphorus tests although there was too much variability for statistically significant differences. There was no pH effect on potassium soil tests, but acidifying the soils resulted in highly significant losses in both calcium and magnesium. These data confirm the importance of monitoring available magnesium soil tests on acid soils. The test result of 34 pounds available magnesium in the 2-4 inch depth for the higher sulfur treatment would be considered deficient for most plants. There is sufficient magnesium in the 0-2 inch depth to provide for the magnesium needs of the turf.

In spite of the range of soil tests on these plots there is no apparent difference in growth of three grasses established on these plots - Baron Kentucky bluegrass, Pennlawn red fescue and Manhattan perennial ryegrass.

Responses of Penncross creeping bentgrass to phosphorus and postassium

The Penncross creeping bentgrass growing on dune sand (Purr-Wick Green) ciency with the typical symptoms of very slow growth and a dark purplish-green color. Phosphorus applications resulted in turf responses as indicated in Table 9, although soil tests indicated there was little phosphorus left in August from the spring application of phosphorus.

A study to evaluate soil test responses was initiated on September 30. Soil tests a month later point out the increases in soil tests in response to application of phosphorus (Table 10) and potash (Table 11) on three soils. There was no apparent turf response to these nutrient treatments in spite of the low tests, although these plots were not subjected to severe stress.

Table 9. Phosphorus response of a Penncross creeping bentgrass green growing on dune sand. Study initiated June, 1983. Averages for 3 replications.

Treatment			Quality Rating (9=greenest)			
P_2O_5 lbs/1000 sq. ft./yr.	Date of application	Available[x] P, lbs/A 8/14/83	July 29	Aug 24	Sept 29	Nov 10
0	--	14[y]	2.0 b[y]	2.5 c	2.5 b	2.0 d
1	spring	13	3.3 a	4.0 ab	3.8 a	3.7 c
2	spring, fall	13	3.3 a	3.8 a	3.8 a	4.3 b
4	spring, fall	18 ns	3.8 a	4.3 a	4.0 a	4.8 a

[x] Available phosphorus (P) determined with Bray P_1

[y] Means in columns followed by the same letter are not significantly different from each other at the 5% level using Duncan's Multiple Range Test.

Table 10. Phosphorus soil test[x] responses on Penncross creeping bentgrass greens growing on 3 soils. Hancock Turfgrass Research Center. Average of 3 replications. Study initiated September 30, 1983, samples taken October 24, 1983.

P_2O_5 applied	Dune sand		sand/peat	Topsoil
lbs/1000 sq. ft.	0-3"	3-6"	0-3	0-3
0	37 cd[y]	14 e	36 b	117 b
0.5	47 bc	19 e	36 b	131 b
1.0	59 b	22 de	46 b	145 b
2.0	76 a	22 de	83 a	187 a

[x] Available phosphorus (P) determined with Brag P_1.

[y] Means in columns followed by the same letter are not significantly different than each other at the 5% level using Duncan's Multiple Range Test.

Table 11. Potassium soil test[x] responses on Penncross creeping bentgrass greens growing on 3 soils. Hancock Turfgrass Research Center. Averages for 3 replications. Studies initiated September 30, 1984. Samples taken October 24, 1983.

K_2O applied	Dune sand		Sand/peat	Topsoil
lbs/1000 sq. ft.	0-3"	3-6"	0-3"	0-3"
0	35 cd[y]	10 c	86 c	124 b
0.5	51 bc	13 c	114 bc	124 b
1.0	66 ab	25 de	149 b	176 ab
2.0	84 a	46 bd	250 a	260 a

[x]Available Potassium (K) determined with neutral normal ammonium acetate.

[y]Means in columns followed by the same letter are not significantly different from each other at the 5% level using Duncan's Multiple Range Test.