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Nitrogen Rate Studies and Potassium Response

Wintergreen chewings fescue, Pennlawn red fescue, and Merion Kentucky bluegrass were seeded in 1965. Merion Kentucky bluegrass sod was laid in 1966. Nitrogen rate studies were initiated in 1967 and have been continued to date. For each treatment the nitrogen was applied as ammonium nitrate in 6 applications: 20% each in mid-April, May, August, and September, and 10% each in June and July. All clippings have been removed. In 1971, the plots were split into two cutting heights, 0.75 and 1.5 inches.

Visual turfgrass quality ratings are given in Tables 17 and 18. The fine leafed fescues (Table 17) have provided good quality turf at the higher nitrogen rates to date. Leafspot attacks have generally been uniform across all nitrogen rates. The annual nitrogen rate recommended for fine leafed fescues is 2 to 4 pounds per 1000 square feet in open, sunny areas, and 1-2 pounds in shady areas.

The sodded Merion Kentucky bluegrass plots (Table 18) have provided better quality turf than the seeded plots at low nitrogen rates, probably because of nitrogen carried in the sod. There has been an encroachment of weedy grasses on the seeded Merion plots at 4 pounds nitrogen or less annually. Dandelion counts also show a significant nitrogen effect. Plots have not been sprayed for weed control for 5 years. Merion needs a minimum of 5 to 6 pounds nitrogen per thousand square feet annually to compete with weeds when the clippings are removed. The nitrogen needs would be reduced about 20% when clippings are returned.

The Merion in the higher nitrogen plots had severe attacks of Fusarium nivale (gray snowmold) in the spring of both 1972 and 1973. Although the disease did not kill the grass, growth was delayed in the spring and the turf was unsightly until growth began. The shorter cutting height resulted in greater disease.

Removing the clippings also significantly reduced the soil phosphorus and potassium tests. Potassium tests in 1966 were 275 to 350 pounds K per acre. In the fall of 1972 the tests had been reduced to 45 to 65 pounds K. The west half of each plot received approximately 3 pounds of K (3.7 pounds  $K_2O$ ) per 1000 square feet, depending on soil test.

The potassium application has resulted in increased drouth tolerance and turfgrass density of the Kentucky bluegrass. There has also been some indication of less susceptibility to leafspot on all grasses where K was applied.

The extensive rainy periods during 1971 and 1972 have increased the leaching of potassium, especially on the sandier soils. It is important to keep soil potassium levels adequate. A soil test is necessary to determine soil nutrient levels. For information on soil testing contact your county agricultural extension agent, the Michigan State University Soil Testing Laboratory, or a reputable private testing agency.

Table 17. Effect of nitrogen rate and cutting height on visual turfgrass quality ratings of Wintergreen chewings and Pennlawn Red Fescue. Averages of 3 replications for 1971-72. (1=best; 10=poor)

Annual rate pounds per 1000 sq ft	Wintergreen		Pennlawn	
	3/4 in.	1.5 in.	3/4 in.	1.5 in.
0	5.9	5.7	5.7	5.4
1	4.1	4.1	4.4	4.3
1.5	3.9	4.0	4.0	4.1
2	3.5	3.4	3.5	3.5
2.5	3.3	3.0	3.2	3.1
3	3.0	2.7	2.8	2.7
4	2.7	2.6	2.4	2.4
6	2.6	2.5	2.0	2.0
2-Apr	3.9	3.6	3.9	3.8
2-Aug	4.3	4.0	3.8	3.9
2-Apr, Aug	3.7	3.6	3.5	3.4

Table 18. Effect of nitrogen rate and cutting height on visual turfgrass quality ratings, dandelion encroachment, and percentage of turfgrass area infested with Fusarium nivale on Merion Kentucky bluegrass. Averages of 3 replications

Annual rate (lbs/1000 sq ft)	Cutting height (inches)	Turfgrass quality <sup>a</sup>		Dandelions/plot <sup>c</sup>		% area diseased <sup>b</sup>	
		Seeded	Sodded	Seeded	Sodded	Seeded	Sodded
0	3/4	7.6	6.5	65	42	1	3
	1 1/2	7.6	6.5	171	99	0	1
2	3/4	5.7	4.9	16	19	9	12
	1 1/2	5.6	4.8	60	27	3	6
4	3/4	4.0	3.3	10	5	46	42
	1 1/2	3.9	3.4	11	7	16	19
6	3/4	3.0	2.7	0	3	48	52
	1 1/2	3.0	2.8	1	2	19	29
8	3/4	2.9	2.7	0	0	15	26
	1 1/2	2.7	2.6	0	0	15	26
10	3/4	2.7	2.6	0	0	63	55
	1 1/2	2.5	2.6	0	0	26	30
12	3/4	3.0	2.9	0	0	58	44
	1 1/2	2.8	2.7	0	0	15	23
14	3/4	3.2	2.9	0	0	62	51
	1 1/2	3.0	2.7	0	0	14	28

<sup>a</sup> Averages of monthly ratings for 1972 and 1973 (1 = best; 10 = poor).

<sup>b</sup> Averages of ratings taken in March, 1972 and 1973.

<sup>c</sup> Counts taken in May, 1972.