

STOP: 8

Long-Term Nitrogen Fertilization Effects on Red Fescue
and Kentucky Bluegrass Turfs.

K. T. Payne and P. E. Rieke

Merion Kentucky bluegrass was seeded or sodded in 1965. Annual nitrogen treatments of 0, 2, 4, 6, 8, 10, 12, and 14 pounds per 100 sq. ft. were initiated in 1966 and continued through 1975. In 1976, 2 pounds nitrogen were applied per 100 sq. ft. over all plots. In 1968, two mowing heights (1 and 2 inches) were imposed on the plots. All clippings have been removed from plot during the course of the study. Conclusions from the study are:

1. Annual N rates of about 8 pounds per 1000 sq. ft. or higher were necessary to keep dandelions from encroaching the seeded turf; 6 pounds on the sodded turf.
2. Generally, about 2 more pounds of N were required annually on the seeded turf than on the sodded turf to maintain a comparable quality turf.
3. The encroachment of weedy grasses has been much greater in the seeded plots than in the sodded plots (Tables A and B). These weedy grasses were not apparent in the turf during the first 5 years of the study.
4. The higher N rates and the shorter mowing height led to increased snowmold infestations during 2 winters.
5. Removal of clippings led to greater depletion of P and K on high nitrogen plots than at lower nitrogen rates. No P or K fertilizers were used during the course of the study. The original soil tests for these nutrients were very high. Thus when clippings are removed it is especially important to follow a regular program of P and K fertilization. This can be checked easily with effective soil testing.
6. The plots were subdivided in 1973 with one half receiving supplemental K. The K deficient areas have shown much greater susceptibility to moisture stress, resulting in significant thinning of the turf.
7. The K deficient areas have also shown greater seedhead formation than where K is sufficient. This might suggest that keeping K levels high could be a means of reducing seedhead formation on other grasses, although this has not been tested.
8. Windsor, Newport, and Delta Kentucky bluegrasses have demonstrated responses similar to Merion except that leafspot susceptibility, particularly with Newport and Delta, resulted in greater dandelion encroachment than found with Merion at comparable nitrogen levels.
9. Through 1976 no Fusarium blight had infested the Merion Kentucky bluegrass but application of the higher rates used in this study will often encourage Fusarium injury.

Pennlawn and Wintergreen red fescues were established in 1965; treatments were initiated in 1966. Annual treatments (divided in monthly applications) of 0, 1, 2, 3, 4, 6, 8, and 12 pounds N per 1000 sq. ft., as well as treatments of 2 pounds N in April; 2 pounds N in August; and 1 pound N each in April and August. Conclusions from this study are:

1. Both Pennlawn and Wintergreen red fescues tolerated the very high N levels under the conditions of moderate watering. These plots were seldom watered more than once per week. One winter the Wintergreen plots had slightly more snowmold than Pennlawn. The higher N rates resulted in somewhat more leafspot during a number of years but the recovery from leafspot injury was more rapid on the higher N plots as well. Both grasses performed well at the 1 inch mowing height, even under the 12 pounds N annual treatment.
2. Encroachment of broadleaf weeds has been negligible on the red fescues at low N rates in contrast to the observations on the Kentucky bluegrass plots.
3. More thatch has accumulated on the higher N plots than at lower N levels.
4. Applying 1 pound of N in August as the only N treatment was not sufficient to hold a modest quality turf during the following June to August period on this fine dandy loam soil. Some late spring N was also necessary.
5. Applying 2 to 3 pounds N per 1000 sq. ft. annually when clippings are removed provided a modest quality of turf that was nearly weed free. This is a distinct advantage of the red fescues as low energy requiring grasses.
6. During 1976 all plots received 2 pounds N per 1000 sq. ft. Nearly all evidence of residual effects of the wide range in N treatments have been removed. Even the plots which had received no N for 10 years now have good density.

Table A. Effects of 10 Years of Nitrogen Treatments on the Encroachment of Weedy Grasses into Sodded Kentucky Bluegrass. East Lansing.

Annual N Rate lbs/100 sq.ft.	Merion %	Red Fescue %	Rough Bluegrass %
0	99.1	0.5	0.4
2	99.8	0	0.2
4	100.0	0	0
6	100.0	0	0
8	100.0	0	0
10	100.0	0	0
12	100.0	0	0
14	100.0	0	0

Table B. Effects of 10 Years of Nitrogen Treatments on the Encroachment of Weedy Grasses into Seeded Merion Kentucky Bluegrass. East Lansing.

Annual N Rate lbs/1000 sq.ft.	Merion %	Timothy %	Orchard- Grass %	Red Fescue %	Rough Bluegrass %
0	37.4	35.6	11.3	10.9	4.8
2	53.1	8.9	1.5	24.1	12.4
4	62.0	9.3	0	20.4	8.3
6	89.1	0.9	0	9.1	0.9
8	92.8	0.5	0	6.7	0
10	97.2	0	0	2.0	0.8
12	97.8	0	0	2.2	0
14	97.4	0	0	2.6	0