Higher nitrogen rates resulted in an increase in the incidence of stripe smut on Merion Kentucky bluegrass in June at Traverse City as suggested in Table 2. Plots receiving the highest nitrogen rate (12 pounds nitrogen annually, divided into 6 monthly applications) were especially susceptible. When extremely high nitrogen rates were applied in late April the incidence of stripe smut was also increased. Thus timing of nitrogen application is also a factor. The disease rating was lower on plots receiving nitrogen as sewage sludge (Milorganite) and ureaformaldehyde (38%) compared to ammonium nitrate. This is a further indication of the slower rate of nitrogen release from these organic nitrogen carriers compared to the soluble ammonium nitrate. Although these nitrogen rates are excessively high, these data do point out the importance of modest nitrogen fertilization in the spring of the year. Modest spring nitrogen rates are also suggested for reducing a susceptibility of Kentucky bluegrasses to Fusarium blight.

Table 2. Incidence of stripe smut on Merion Kentucky bluegrass at Traverse City in June as affected by nitrogen treatment.

Treatment			Stripe Smut Incidence
N rate lbs/1000 sq ft	Carrier	Time of application	(1=none; 10=severe)
0	---	---	0.5
4	ammonium nitrate	monthly	1.5
8	ammonium nitrate	monthly	3.5
12	ammonium nitrate	monthly	8.5
8	ammonium nitrate	Apr	4.5
8	ammonium nitrate	Apr, June, Aug	2.0
8	ammonium nitrate	Apr, Aug	2.5
8	Milorganite	Apr	3.0
8	ureaformaldehyde	Apr	2.5

Higher nitrogen rates resulted in an increase of *Poa annua* in a mixed Merion Kentucky bluegrass *Poa annua* turf (see Table 3). Plugs of *Poa annua* were planted into the Merion sod in 1971 and treatments initiated in 1972. The turf is mowed at 3/4 inch. The *Poa annua* has steadily increased in the turf since the initiation of the treatments. Higher rates of nitrogen in the spring have also tended to encourage the *Poa annua* encroachment rate into the turf. In this study the use of sewage sludge has also resulted in an increase of the *Poa annua* encroachment rate. Similar increases in *Poa annua* have been observed at Traverse City in a Pennlawn red fescue turf where *Poa annua* has encroached naturally in the irrigated turf.

Table 3. Effect of nitrogen treatment on the composition of a Merion Kentucky bluegrass-*Poa annua* polystand at East Lansing. Treatments were initiated in 1972. Averages of 3 replications. November, 1975.

Treatment			*Poa annua* in turf
N rate lbs/1000 sq ft	Carrier	Time of application	
0	---	---	47
2	ammonium nitrate	monthly	58
4	ammonium nitrate	monthly	63
6	ammonium nitrate	monthly	65
8	ammonium nitrate	monthly	73
12	ammonium nitrate	monthly	72
4	ammonium nitrate	Apr, May, Aug	55
4	ammonium nitrate	Apr, Aug, Sept	50
4	ammonium nitrate	May, July	38
4	ammonium nitrate	Apr	80
4	ammonium nitrate	Apr, Aug	67
4	milorganite	Apr	
8	milorganite	Apr	

Returning clippings to the turf is a good means of recyclying the nutrients contained in them. In a study of the effects of management practices on Merion Kentucky bluegrass initiated by James Beard in 1963 at East Lansing the return of clippings has resulted in an improvement in color of the turf compared to where the clippings have been removed. Table 4 shows data taken in November, 1975 to illustrate this point. The differences in color are most marked in spring and fall when cool soil temperatures limit organism activity and rate of nitrogen release in the soil. However, returning clippings has also resulted in an increase in the incidence of stripe smut. In June, 1975 there was considerable stripe smut evident on plots where clippings were returned. When clippings were removed there was no stripe smut apparent. In addition there has been encroachment of *Poa annua* when clippings are returned but only when the turf was mowed at 1 inch. At the 2-inch mowing height *Poa annua* has not apparently been competitive with the Merion.