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.

Table 4. Management practices effects on color of Merion Kentucky bluegrass at East Lansing. Treatments initiated in 1963. Data taken November, 1975.

Annual N rate lbs/1000 sq ft	Mowing height	Visual turfgrass color rating (1=dark green; 9=yellow)			
		Return clippings		Remove clippings	
		1 inch	2 inches	1 inch	2 inches
4		2.7	2.2	6.1	5.5
6		2.4	1.8	5.8	5.0
8		2.5	1.4	5.0	3.9
10		2.3	1.4	4.6	3.8
12		2.1	1.1	4.0	2.8
14		1.8	1.2	3.9	2.8
Average		2.3	1.5	4.7	4.0

Table 5. Management practices effects on the encroachment of Poa annua into Merion Kentucky bluegrass at East Lansing. Treatments initiated in 1963. Data taken November, 1975.

Annual N rate lbs/1000 sq ft	Mowing height	Poa annua in turf, Percent			
		Return clippings		Remove clippings	
		1 inch	2 inches	1 inch	2 inches
4		18	0	1	0
6		19	0	0	0
8		23	0	0	0
10		20	0	0	0
12		16	0	1	0
14		25	0	0	0

Applying ferrous sulfate to bentgrass turf mowed at 1/4 inch resulted in improved turfgrass color (Table 6). The ferrous sulfate was applied at rates of 0,3,6, and 12 ounces per 1000 square feet at 2 week intervals. The higher ferrous sulfate rates resulted in some injury to the turf. In some cases the higher rates caused the turf to turn a blackish-green color. The injury appeared as a tip burn of some of the leaves.