

STOP: 11

Effects of Fertility Programs on the Composition of a Mixed
Poa Annua - Merion Kentucky Bluegrass Turf.

P. E. Rieke

There are many factors which can ultimately influence the composition of a mixed turfgrass sward. Many golf course superintendents have learned to manage Poa annua as the predominant grass in their courses. This study was designed to evaluate the effects of several fertility programs on the competitive ability between Poa annua and Merion Kentucky bluegrass mowed at fairway height. In 1971, 21 plugs of Poa annua were transplanted into 4 foot by 8 foot plots of Merion Kentucky bluegrass. Treatments were initiated in 1972. The percentage of Poa annua was determined in October, 1976. Considerable Poa trivialis has encroached into several plots, as well as some bentgrass. Higher N rates and spring applications of N have encouraged Poa annua compared to other treatments (Table A). The balance between N, P_2O_5 , and K_2O did not affect the amount of Poa annua, but when calcium arsenate had been applied as an herbicide for Poa annua the subsequent use of phosphorus encouraged Poa annua dramatically (Table C). The use of lime to raise pH (Table D) reduced the effectiveness of calcium arsenate in controlling Poa annua at the lower rate of arsenate application, but had no influence at the higher arsenate application rate. Acidifying the soil with sulfur increased arsenic toxicity as well.

Although calcium arsenate is not currently being used for Poa annua one should be extremely careful about allowing soils on which calcium arsenate had been used in the past to become acid (either naturally or by applying acidifying agents such as sulfur) since this will make any arsenate which is present more soluble. This could result in injury not only to Poa annua but also to other species of grasses which you would like to keep in the turf. Keeping the soil pH above 6.5, applying sufficient phosphorus, and maintaining good drainage are important means for preventing arsenic injury in the future.

Table A. Effect of Nitrogen Treatment and Carrier on a Poa Annua - Merion Kentucky Bluegrass Turf. East Lansing. Counts taken October, 1976.

Annual N Rate lbs/1000 sq ft	Carrier	Date of Application	% <u>Poa Annua</u>	
			Actual	Corrected*
0			49.0	50.3
2	33-0-0	Monthly	64.7	67.0
4	33-0-0	Monthly	70.0	70.0
6	33-0-0	Monthly	72.7	77.8
8	33-0-0	Monthly	76.0	76.0
12	33-0-0	Monthly	70.5	83.3
4	Milorganite	monthly	54.5	74.3
8	Milorganite	monthly	63.2	90.7
4	33-0-0	Apr, May, Aug	60.9	88.4
4	33-0-0	Feb, May, Aug	66.6	80.5
4	33-0-0	Apr, Aug, Sept	41.8	63.0
4	33-0-0	May, Aug, Nov	36.1	55.5
4	33-0-0	May, Jul	50.4	77.8
4	33-0-0	Apr	84.0	88.6
4	33-0-0	Aug	53.1	56.0
4	33-0-0	Apr-Aug	67.7	71.1

* The "Corrected" column considers the percentage of Poa annua and Merion only. The "Actual" Column reflects the encroachment of bentgrass and Poa trivialis into the turf.

Table B. Effect of Phosphorus-Potassium Balance on a Poa Annua-Merion Kentucky Bluegrass Turf. East Lansing. Counts taken October, 1976.

N	P	K		<u>Poa Annua</u>
lbs/1000 sq ft/year				%
4	0	0		70.0
4	0.5	0		81.6
4	1	0		77.7
4	2	0		90.9
4	0	1		68.6
4	0	2	81.0	81.0
4	0	4		83.6
4	1	2		85.8
4	2	4		88.2

Table C. Effect of Calcium Arsenate and Phosphorus Treatments on a Poa Annua-Merion Kentucky Bluegrass Turf. East Lansing 1976.

N	P	CaAs		<u>Poa Annua</u>
lbs/1000 sq ft				%
per year	per year	since 1971		
8	0	10		22.9
4	0	10		17.6
4	5	10		67.5
4	0	20		1.9
4	5	20		58.9

Table D. Effect of Calcium Arsenate, Lime and Sulfur Treatments on a Poa Annua-Merion Kentucky Bluegrass Turf. East Lansing, 1976.

<u>CaAs</u>	<u>Lime</u>	<u>Sulfur</u>	<u>Poa Annua</u>
Total lbs/1000 sq ft	since 1971	ft	%
10	-	-	17.6
10	200	-	41.4
10	400	-	58.5
20	200	-	8.6
20	400	-	9.5
10	-	50	8.6
10	-	100	6.5
