

The nitrogen carrier study on tall fescue (Table 2) gave responses typically observed in the past on Kentucky bluegrass and perennial ryegrass. Generally, the relative responses among carriers was similar to those observed on annual bluegrass, but the responses lasted longer and differences were smaller on the tall fescue. This was due in part to the higher rate of nitrogen applied per application (1.5 lbs N per 1000 sq ft). And, as in past studies we have observed that grasses which are mowed higher tend to hold nitrogen responses longer than do those mowed short. This was likely the case in these studies even though both grasses were growing on similar soils.

Clipping weight data (Table 3 for annual bluegrass and Table 4 for tall fescue) suggest growth rates in response to the nitrogen carriers was generally consistent with quality rating responses, depending on carrier and time of sampling after application.

TIMING OF NITROGEN ON ANNUAL BLUEGRASS

A study to evaluate timing of nitrogen application on annual bluegrass fairway turf was initiated in 1992 on the new plot area. Nitrogen was applied as urea according to the schedule shown in Table 5. The dates of application are approximately the 15th of each month. Plot size was 4 feet by 14 feet with 4 replications. The plots were mowed at 5/8 inch. Irrigation was applied to prevent wilt.

Turf quality ratings for these plots are given in Table 7 and clipping weight data for 3 dates are given in Table 6. There were no unusual responses this first growing season. The untreated check had very low quality ratings throughout the season with significant dollarspot at times. Those plots receiving 1 and 2 lbs N per 1000 sq ft often had low ratings as well. The objective of this study is to determine if very low nitrogen rates or if timing of application of nitrogen will have an impact on turf quality and susceptibility to stress.

Table 5. Timing and Rate of Urea Applications – Annual Bluegrass Timing Study – 1992

TREATMENT	ANNUAL NITROGEN PER 1000 SQ. FT.	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	NOVEM- BER
1	1	0	.5	0	0	0	.5	0
2	2	0	1	0	0	0	1	0
3	4	1	1	1	0	1	1	0
4	6	1	1	1	1	1	1	0
5	4	1	1	1	0	0	1	0
6	4	0	0	1	.5	.5	1	1
7	4	0	0	1	1	1	1	0
8	4	0	0	.5	.5	.5	.5	2
9	0	0	0	0	0	0	0	0
10	4	0	1	1	0	1	1	0
11	4	0	1	1	0	1	1	0
12	4	0	1	1	0	1	1	0
13	4	0	1	1	0	1	1	0
14	4	0	1	1	0	1	1	0

Table 6

Evaluation of Urea Treatments on an Annual Bluegrass Fairway
 Quality Ratings, 1 = poor 9 = excellent
 Treatments were applied at various times and rates throughout the season.

Treatment	JUN 13	JUL 16	AUG 6	AUG 18	AUG 19	AUG 26	SEPT 29	OCT 6	OCT 9	OCT 14	OCT 22	OCT 27	NOV 9
1	5.4 c	4.8 fg	4.1 d	3.5 d	3.6 e	4.0 d	6.3 c	6.1 cd	5.4 cd	5.6 d	5.8 d	5.1 c	5.3 d
2	6.4 b	5.1 f	4.0 d	3.6 d	4.1 d	3.8 d	6.8 abc	7.1 abc	7.0 ab	6.9 abc	6.9 ab	6.0 abc	5.6 bcd
3	6.1 b	6.8 bcd	5.0 ab	8.0 a	8.0 a	7.1 a	6.4 bc	6.4 bc	6.6 ab	6.9 abc	6.8 ab	6.1 ab	5.6 bcd
4	7.8 a	7.3 ab	4.8 bc	8.0 a	8.0 a	7.3 a	7.1 a	7.5 a	7.6 a	7.4 ab	7.4 ab	6.9 a	6.1 a
5	7.9 a	7.6 a	5.3 a	5.3 c	4.8 c	5.0 c	6.4 bc	6.6 abc	7.0 ab	6.8 bc	6.6 bc	6.4 ab	5.4 d
6	4.4 d	6.5 cd	4.8 bc	7.0 b	7.3 b	5.8 b	6.9 ab	7.4 ab	7.4 a	7.5 ab	7.3 ab	6.6 ab	5.9 abc
7	4.3 d	6.4 de	4.4 cd	7.6 a	8.0 a	7.3 a	6.9 ab	7.4 ab	7.5 a	6.9 abc	7.4 ab	6.5 ab	6.0 ab
8	4.4 d	5.9 e	4.4 cd	7.0 b	7.5 b	5.8 b	6.5 bc	6.5 abc	6.0 bc	6.1 cd	5.9 cd	5.9 bc	5.5 cd
9	4.1 d	4.5 g	4.8 bc	3.8 d	3.8 e	3.8 d	5.3 d	5.3 d	4.4 d	4.4 e	5.1 d	3.6 d	4.5 e
10	6.1 b	7.3 ab	5.4 a	8.0 a	8.0 a	7.1 a	6.8 abc	7.4 ab	7.4 a	7.6 ab	7.5 a	6.8 ab	6.0 ab
11	6.3 b	7.0 bc	5.3 a	7.9 a	7.9 a	7.3 a	6.8 abc	7.3 ab	7.3 a	7.5 ab	7.1 ab	6.3 ab	6.0 ab
12	6.3 b	7.0 bc	5.1 ab	8.0 a	8.0 a	7.0 a	6.8 abc	7.3 ab	7.5 a	7.8 a	7.5 a	6.8 ab	6.0 ab
13	6.1 b	7.0 bc	5.3 a	8.0 a	8.0 a	7.1 a	6.8 abc	7.4 ab	7.5 a	7.8 a	7.4 ab	6.8 ab	6.0 ab
14	6.4 b	7.1 ab	5.4 a	8.0 a	8.0 a	7.1 a	6.8 abc	7.3 ab	7.1 ab	7.3 ab	7.3 ab	6.6 ab	6.0 ab

Means followed by the same letter are not significantly different at the 5% level using the LSD mean separation test.

Table 7. Annual Bluegrass Urea Timing Study 1992
Clipping weights in grams

TREATMENT	JULY 20	AUGUST 11	SEPTEMBER 4
1	8.09 de	4.89 cd	5.61 e
2	10.32 cde	4.32 d	4.36 e
3	16.30 abc	6.58 bcd	18.49 bc
4	16.48 abc	9.51 ab	27.37 a
5	21.05 a	12.51 a	10.29 de
6	14.61 abcd	6.22 bcd	10.47 de
7	15.66 abc	9.07 abc	19.75 b
8	12.58 bcde	5.40 bcd	10.04 de
9	7.71 e	5.82 bcd	4.13 e
10	18.98 ab	5.82 bcd	15.94 bcd
11	12.26 bcde	5.74 bcd	15.14 bcd
12	13.90 bcde	6.16 bcd	12.85 cd
13	14.12 bcde	6.22 bcd	12.23 cd
14	13.18 bcde	6.02 bcd	14.38 bcd

Means followed by the same letter are not significantly different at the 5% level using the LSD mean separation test.