

Do Foliar Fertility Products Enhance N Uptake and Turfgrass Performance?

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Objectives:

1. *Do commercially available foliar fertility products enhance turfgrass performance compared to urea alone?*
2. *Is nitrogen uptake improved by commercially–available foliar products when compared to urea alone?*

This project seeks to answer two basic questions regarding foliar fertility of putting green turf. First, do commercially available foliar fertility products enhance turfgrass performance compared to urea alone, and, secondly, is nitrogen uptake improved by commercially available foliar products when compared to urea alone?

To answer the second question requires the use of ^{15}N labeled–urea and sophisticated laboratory analysis. We initiated two experiments in 2013 to determine the quantity of ^{15}N uptake by creeping bentgrass turf. These experiments are still being analyzed and data won't be complete until 2014.

The first question can be examined by a traditional field study, which we initiated in early June of 2013. In this study, five commercially available foliar fertilizers were applied weekly at a rate of 0.1 lbs N/M/wk beginning on June 3, 2013 and continuing until October 14th. A total of 21 applications were made and so a total of 2.1 lbs N/M were applied during the growing season. In addition, the plots were topdressed weekly with sand, mowed 6x per week at a height of 0.125", and clippings were collected once per week to measure turfgrass growth. Besides clippings, visual turfgrass quality and color evaluations were collected weekly. Soil type was a Drummer silty clay loam. The site had not



Foliar fertilizers applied at 0.1 lb N per 1000ft² per week resulted in no to very slight increases in turfgrass growth. Foliar fertilizers increased turfgrass color and quality significantly, but differences between products were minimal.

been fertilized or topdressed in nearly 2 years and was lacking in color and density with visible openings in the turf that led to algal growth.

Somewhat surprisingly, there were only three clipping collection dates with significant differences between treatments, and when clippings were summed over the entire growing season, there was no difference

Table 1. Clipping weights as influenced by various foliar fertilizers. Clippings were collected once per week and are expressed as grams (dry) per plot.

Treatment	6/11	6/18	6/25	7/2	7/9	7/16	7/23	7/30	8/6	8/13	8/20	8/27	9/3	9/9	9/16	9/24	Total
Nutri-Rational True Foliar 19-1-6	9.4*	13.5	21.5	14.2	14.9	12.4 b	14.8	16.4 ab	14.2 c	14.4	13.2	15.9	16.9	17.0	13.8	12.8	235.2
Floratine Power 23-0-0	9.8	14.5	24.2	14.4	16.3	13.1 a	16.3	17.8 a	15.9 a	14.2	13.2	15.2	16.4	16.2	13.4	12.5	243.4
Gary's Green 18-3-4 + iron	9.8	13.9	21.2	14.0	14.9	13.1 a	14.6	15.0 bc	15.6 a	13.6	13.6	15.4	15.8	16.3	13.7	12.9	233.4
Simplot Partners 18-3-6 with UMAXX	9.8	13.8	22.3	13.9	15.3	13.2 a	14.8	16.0 abc	15.6 a	13.2	12.6	15.3	16.0	16.7	13.3	12.2	234.2
Urea + FeSO ₄	9.6	13.1	23.3	14.2	15.4	13.1 a	14.9	15.7 bc	15.3 ab	13.8	13.0	15.5	16.4	16.6	13.5	12.6	235.9
Control	9.5	13.5	25.8	13.8	14.6	12.4 b	15.0	14.5 c	14.5 bc	15.0	13.4	16.1	17.1	17.9	14.2	13.1	240.4
Foliar Pak 23-0-0	9.8	13.7	20.8	13.8	15.0	13.2 a	14.4	15.3 bc	15.5 a	14.1	13.6	16.4	16.9	16.9	13.7	12.9	235.9
LSD (P=0.05)	NS	NS	NS	NS	NS	0.5	NS	1.9	0.9	NS	NS	NS	NS	NS	NS	NS	NS

between treatments (Table 1). This illustrates that a fertile soil supplies most of the nitrogen used for growth. The foliar applications of N did not consistently increase in clipping production. Indeed, in September, the control consistently produced more clippings than any of the treatments, although not statistically different from any treatments (Table 1).

Turf quality ratings indicated that the effects of the foliar fertilizers took a while to kick in as there were no significant differences in turf quality until the August 2 rating. Beginning in August, there were significant quality differences at each rating until mid-September. The main difference was increase turf quality compared to the unfertilized control. There were few differences between the various foliar fertilizer treatments. Urea plus FeSO₄ compared favorably to most of the commercially available products. While there were no significant differences, Gary's Green was always in the top grouping for color and quality (Tables 2a and b).

We observed that with topdressing and foliar

fertilization, most of the open, algae-filled voids filled during the trial. We rated the plots in August for open voids in the turf and the differences were highly significant. Each of the foliar treatments helped the turf to heal and fill-in any voids in the turf. Only the control and the Nutri-Rational True Foliar product showed significantly less recovery than the other foliar products.

Summary Points

- Foliar fertilizers applied at 0.1 lb N/M/wk resulted in no to very slight increases in turfgrass growth.
- Foliar fertilizers increased turfgrass color and quality significantly, but differences between products were minimal.
- While increases in clipping production were small, five of the six foliar treatments resulted in significant turf recovery.

Table 2a. Average monthly quality ratings for 2013.

Treatment	Jun	Jul	Aug	Sep	Oct
Nutri-Rational True Foliar 19-1-6	4.6*	5.9 A	6.6 BC	6.8	6.3 A
Floratine Power 23-0-0	4.7	6.3 A	7.1 AB	6.6	6.4 A
Gary's Green 18-3-4 + iron	4.7	6.2 A	8.1 A	7.8	6.9 A
Simplot Partners 18-3-6 with UMAXX	4.6	6.1 A	7.7 AB	7.2	6.6 A
Urea + FeSO ₄	4.7	5.9 A	7.4 AB	7.4	6.6 A
Control	4.6	5.3 B	5.4 C	6	5.5 B
Foliar Pak 23-0-0	4.7	6.1 A	7.8 AB	7.2	6.7 A
LSD (P=0.05)	NS	0.5	1.4	NS	0.7

* Turf quality was rated visually on a scale of 1–9 where 9 represented outstanding quality, 6.5 represented minimum acceptable quality and 1 represented extremely poor turf quality.

Table 2b. Average monthly color ratings for 2013.

Trmt	Jun	Jul	Aug	Sep	Oct
Nutri-Rational True Foliar 19-1-6	5.0	6.4 A	7.9 AB	7.7 AB	7.5 AB
Floratine Power 23-0-0	4.9	6.1 AB	7.5 AB	6.7 BC	7.2 B
Gary's Green 18-3-4 + iron	5.0	6.2 AB	8.1 A	8.2 A	7.9 A
Simplot Partners 18-3-6 with UMAXX	5.3	6.1 AB	7.7 AB	7.0 ABC	7.3 B
Urea + FeSO ₄	4.8	5.9 BC	7.3 B	7.4 AB	7.8 AB
Control	4.6	5.7 C	5.4 C	6 C	6.2 C
Foliar Pak 23-0-0	4.9	6.1 AB	7.6 AB	7.2 ABC	7.5 AB
LSD (P=0.05)	NS	0.3	0.8	1.3	0.6

* Turf color was rated visually on a scale of 1–9 where 9 represented darkest green color and 1 represented light green/yellow turf color.