



## **Liquid and Granular Nitrogen Spoon-feed Programs on a Creeping Bentgrass Tee**

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**Goal:** Evaluate newer fertilizer products

**Location:** Sunshine Course number 1 forward tee – Lemont, Illinois

**Background:** Frequent applications of low N rates, spoon-feeding, of is a common practice used by golf course superintendents to moderate rate of growth and provide healthy turfgrass. The standard that has been used by golf course superintendents for decades has been nitrogen by urea 46-0-0. Urea is quick release nitrogen source with a low potential for foliar burn that readily dissolves in water. N by urea at 0.1 to 0.15 lb N/1000 sq. ft every 14 days, provides excellent turf quality (dark green color and good density). However, concern exists that quick release N sources can result in an undesirable flush of growth after application and cause problems with ball roll speed, thatch production and scalp potential. Newer fertility products contain urease inhibitors to slow N availability to plants. At least two products are now widely accepted on Chicago golf courses. Such products claim a more efficient and consistent N use by bentgrass and allow for lower N rates versus standard spoon-feeding programs (e.g., N by urea). A product that can allow reduced fertilizer inputs without sacrificing turf quality is a positive outcome.

**Brief Material and Methods:** Nine treatments were evaluated on forward number 1 tee of Sunshine Course in Lemont, IL. The tee surface is 'Princeville' creeping bentgrass and is a large uniform surface of good quality turf that previously has been without research. The tee has a sand-based rootzone that was originally established by seed during fall 2002. Plots were 4 ft x 6 ft and are arranged in a randomized complete block design with 4 replications. Six treatments were applied with a CO<sub>2</sub> backpack sprayer using 8004 TeeJet nozzles at 40 psi in water equivalent to 2 gal/1000ft<sup>2</sup>. Two granular treatments were applied using a shaker by hand. The first application of treatments began sometime in May or and will continue through September. Dollar spot and brown patch was quantified until the diseases reached unacceptable damage levels (5-10%). Weekly, plant health measurements were visual quality, visual color and electronic NDVI. Statistical analysis used Fisher's LSD, P < 0.05.

Table 1. Treatments for plant health on number 1 forward teebox at Sunshine Course, Lemont, IL in 2010.

	Treatment and type	Interval (days)	Nitrogen per 1,000 ft <sup>-2</sup>	25 May	6 Jun	20 Jun	27 Jun	4 Jul	18 Jul	1 Aug	15 Aug
1	Untreated	....	....								
2	Arysta 15-0-7 liquid	14	0.25 lb				x	x	x	x	x
3	Arysta 15-0-7 liquid	28	0.25 lb				x		x		x
4	Urea 46-0-0 liquid	14	0.25 lb	x	x	x		x	x	x	x
5	Urea 46-0-0 liquid	28	0.25 lb	x		x			x		x
6	UMaxx 47-0-0 liquid	14	0.25 lb	x	x	x		x	x	x	x
7	UMaxx 47-0-0 liquid	28	0.25 lb	x		x			x		x
8	Andersons 6-0-12 granular	14	0.25 lb	x	x	x		x	x	x	x
9	Andersons 6-0-12 granular	28	0.25 lb	x		x			x		x

*\*first applications 25 May and 6 Jun for all trts. except Arysta 15-0-7. All trts. began end of June. Single application of Imprelis made 30 May as a test for bentgrass tolerance/phytotoxicity.*

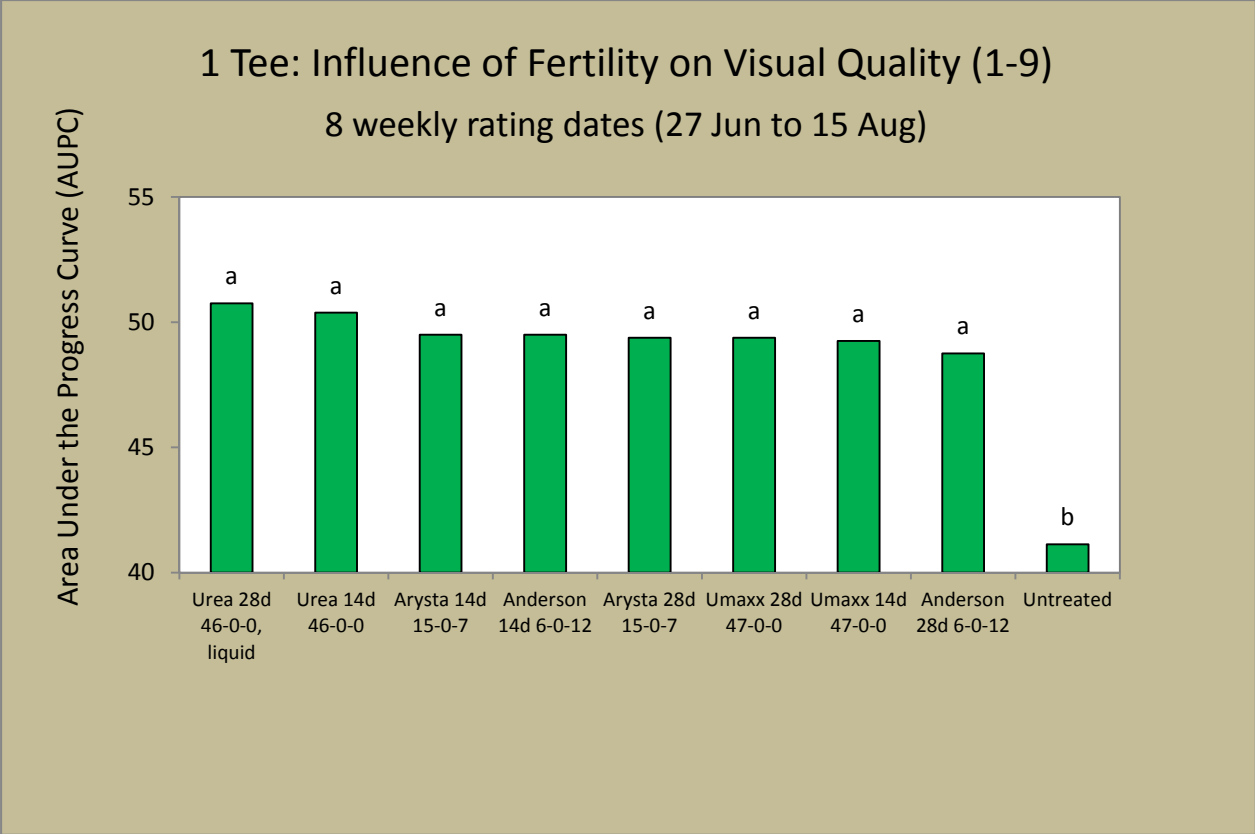


Figure 2. Visual Quality. All N fertility treatments were similar and all were better than untreated. Untreated had poor color which at times appeared as LDS symptoms. Forward 1 teebox fertility trial, Sunshine Course, Lemont IL in 2011.

1 Tee: Influence of Fertility on Visual Color (1-9)  
5 weekly rating dates (22 Jun to 15 Aug)

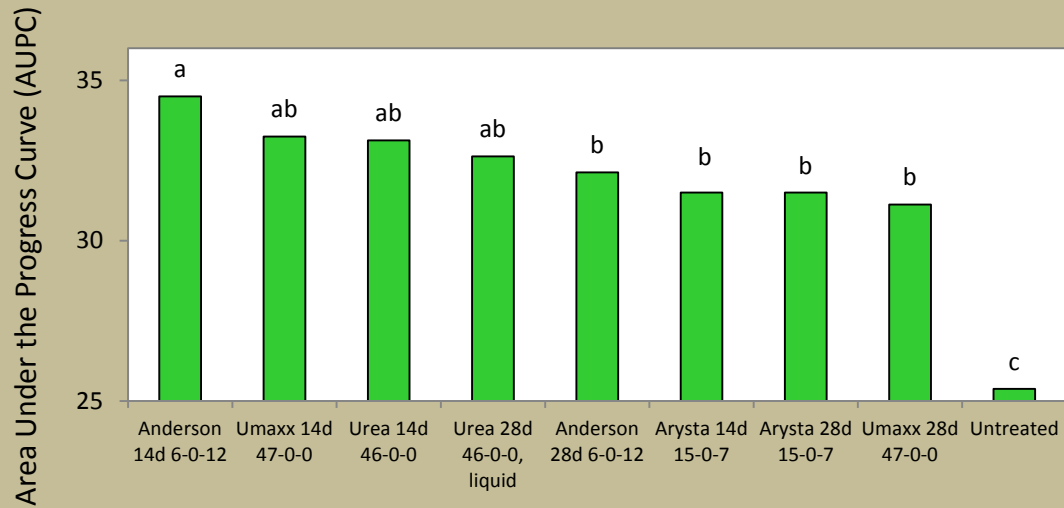


Figure 3. Color. All N fertility treatments were similar except Anderson's granular every 14 days which was better than most 28 day treatments which received half as much N. Untreated and Imprelis had poor color which at times appeared as LDS symptoms. Forward 1 teebox fertility trial, Sunshine Course, Lemont IL in 2011.

1 Tee: Influence of Fertility on NDVI  
 NDVI = Normalized Difference Vegetative Index  
 8 weekly rating dates (22 Jun to 15 Aug)

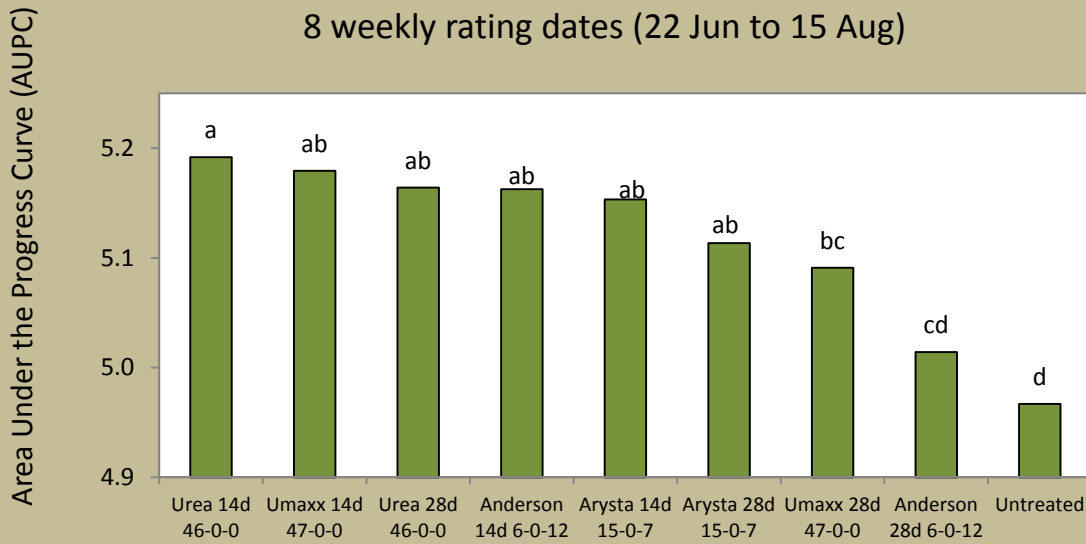


Figure 4. NDVI. All N fertility treatments were similar at 14 day interval with Arysta 28 day also statistically similar. Anderson's every 28 day was similar to the untreated control indicating it had less green color. Forward 1 teebox fertility trial, Sunshine Course, Lemont IL in 2011.

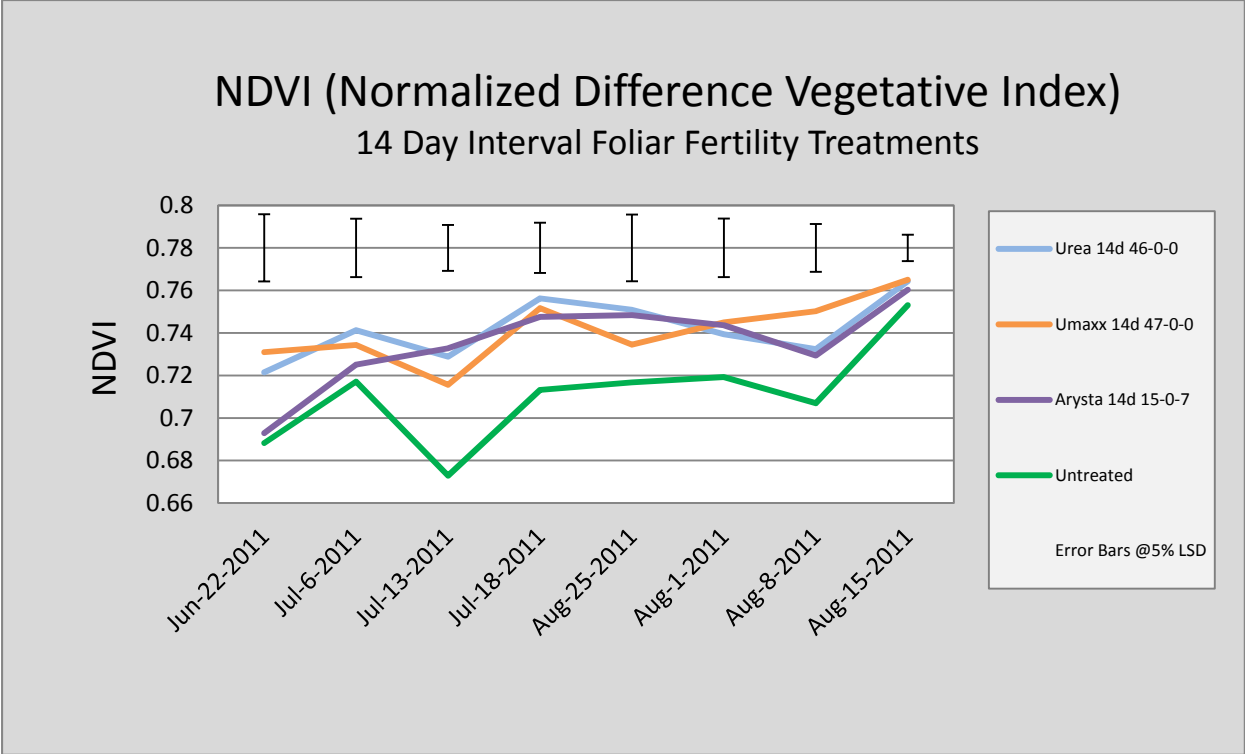


Figure 5. NDVI: All N fertility treatments at 14 day interval were similar and often different than untreated control. First application of Arysta occurred on 27 June. Forward 1 teebox fertility trial, Sunshine Course, Lemont IL in 2011.

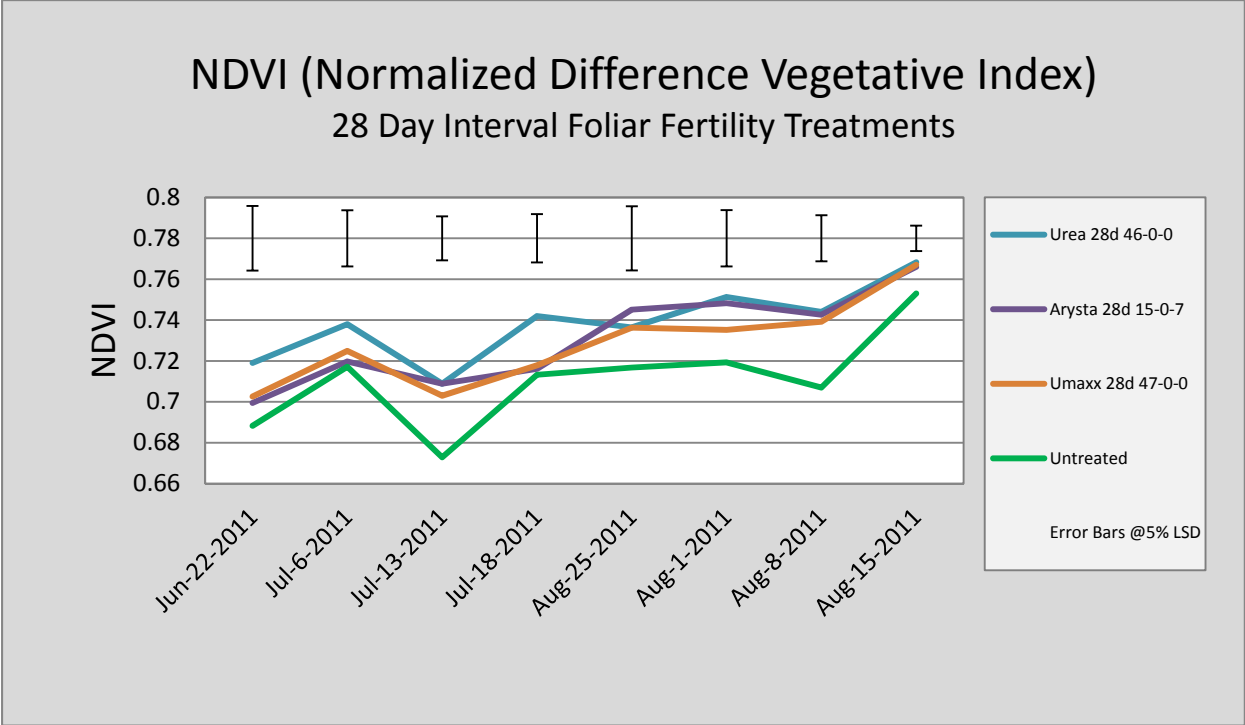


Figure 6. NDVI: N fertility treatments at 28 day interval resulted in half N, but still showed a trend of differences from untreated control that were similar to 14 day interval. Urea and other treatments were capable of long lasting positive effects. Forward 1 teebox fertility trial, Sunshine Course, Lemont IL in 2011.



Image 1. Study review finds color differences. N applied to Arysta began a month later on 27 June. Untreated plots had reduced quality. Sunshine Course, Lemont, IL. *Settle 6-29-11*



Image 2. Study review finds color differences with all N treatments that began 25 May with greener color: UMaxx, Anderson's and Urea. Sunshine Course, Lemont, IL. *Settle 6-29-11*





Image 3. By late July untreated plots (center) have a patchy off-color look where as all N treatments are a darker green. Sunshine Course, Lemont, IL. *Settle 7-27-11*