

Kentucky Bluegrass Lawn Turf Response to Three Autumn Applied Urea Sources, 2003

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Objective:

To evaluate Kentucky bluegrass turf response to three autumn applied urea sources.

Rationale:

Nitrogen (N) is the nutrient required in the greatest abundance for a high quality turfgrass stand. It is essential for maintaining a high shoot density and an aesthetically pleasing green color. Whether it is to improve, or maintain color and overall quality, most home-lawns are fertilized once or multiple times throughout the autumn months (Sept. through Nov.). In most situations the N source used is a urea based source that often is readily water soluble and applied in quantities rarely exceeding 1 lb. of actual N per 1000 ft² so as to avoid turfgrass injury and minimize environmental loss. Since urea is rapidly dissolved in water and used by the plant, an extremely high quality lawn may require several applications to maintain consistent color and quality. This process increases the time and effort that a home-owner would invest in their lawn. By contrast, slow release N sources like sulfur coated urea (SCU) or polymer coated urea (PCU) may offer a potential alternative to repeated applications of water soluble N sources. These products could theoretically be applied once in early September (around Labor-day) at a relatively high application rate (3 lbs. of N). These N sources rarely would cause turf injury are unlikely to be lost to the environment, and would result in a labor savings for the “do-it-yourself” homeowner.

How it was Done:

Three urea sources: urea (46-0-0), sulfur coated urea (32-0-0) and polymer coated urea (41-0-0) were applied to a one year old stand of Kentucky bluegrass turf using several N rates and timings (Table 1).

Treatment No.	N-Source	Application rate	Timing
1	Sulfur Coated Urea	1 lb/1000ft ²	Sept. only
2	Urea	1 lb/1000ft ²	Sept. only
3	Sulfur Coated Urea	3 lb/1000ft ²	Sept. only
4	Urea	3 lb/1000ft ²	1 lb. Sept, Oct, Nov
5	Sulfur Coated Urea	3 lb/1000ft ²	1 lb. Sept, Oct, Nov
6	Polygon	3 lb/1000ft ²	Sept. only
7	Polygon	3 lb/1000ft ²	1 lb. Sept, Oct, Nov
8	None	None	None

All fertilizer treatments were applied by hand using shaker bottles to 4 ft x 4 ft plots with 21 inch borders, initially on 12 Sept., and repeated on 12 Oct. 12 Nov. where treatments specified. The plots were mowed at a uniform height of 2.5 inches with clippings removed. Each treatment was replicated three times in a randomized complete block design. Following fertilizer applications the plots

were irrigated via an overhead irrigation system which supplied a minimum of 0.25 inches of water. Throughout the study the area was irrigated as needed to promote growth and prevent stress.

Plots were rated visually for overall turfgrass quality, and visual color. Turfgrass quality was assessed on a 0 to 10 scale where 0 equals brown or dead turf and 10 equals optimal greenness, density and uniformity. To assess the fertilizer effects on clipping yield, clippings were removed weekly with a bagging mower and the clippings oven-dried. Canopy color was further quantified using a handheld chlorophyll meter (Spectrum Technologies CM-1000) on a weekly basis in conjunction with visual ratings. Five measurements per plot were recorded.

Results to Date:

- As expected, turfgrass quality (TQ) ratings for all treatments declined from Sept. to Nov. (Figure 1). All fertilized treatments had much higher TQ than the unfertilized plots. Kentucky bluegrass fertilized with 3 lbs. of N of PCU or SCU in Sept. maintained the highest TQ throughout the observation period.
- TQ ratings were directly reflected in the visual color ratings (Figure 2) and exhibited a very similar seasonal decline in ratings. Again the 3 lb N applications of SCU or PCU in Sept. had the highest ratings. Monthly (Sept., Oct., and Nov.) applications of these products did not provide similar color to a single Sept., 3 lb. application.
- Since visual ratings are often subjective, a quantitative method using an infrared chlorophyll meter was used to further quantify leaf color. This technique corroborated the visual data very closely (Figure 3).
- Turfgrass clipping yields declined seasonally (Figure 4). The highest clipping yields generally were associated with the uncoated urea applications and the SCU applied at 3 lbs. of N applied in Sept. only.
- These results demonstrate that a high quality, dark green turf with minimal labor inputs of a single 3 lb. N application of PCU or SCU in early Sept. may be appropriate for a home lawn situation. The PCU treatment will result in less clipping production than conventional urea applications or SCU at 3 lb. of N.
- The potential environmental effects and turfgrass safety of these fertilizer applications need to be further quantified before this program is widely recommended.

Acknowledgments

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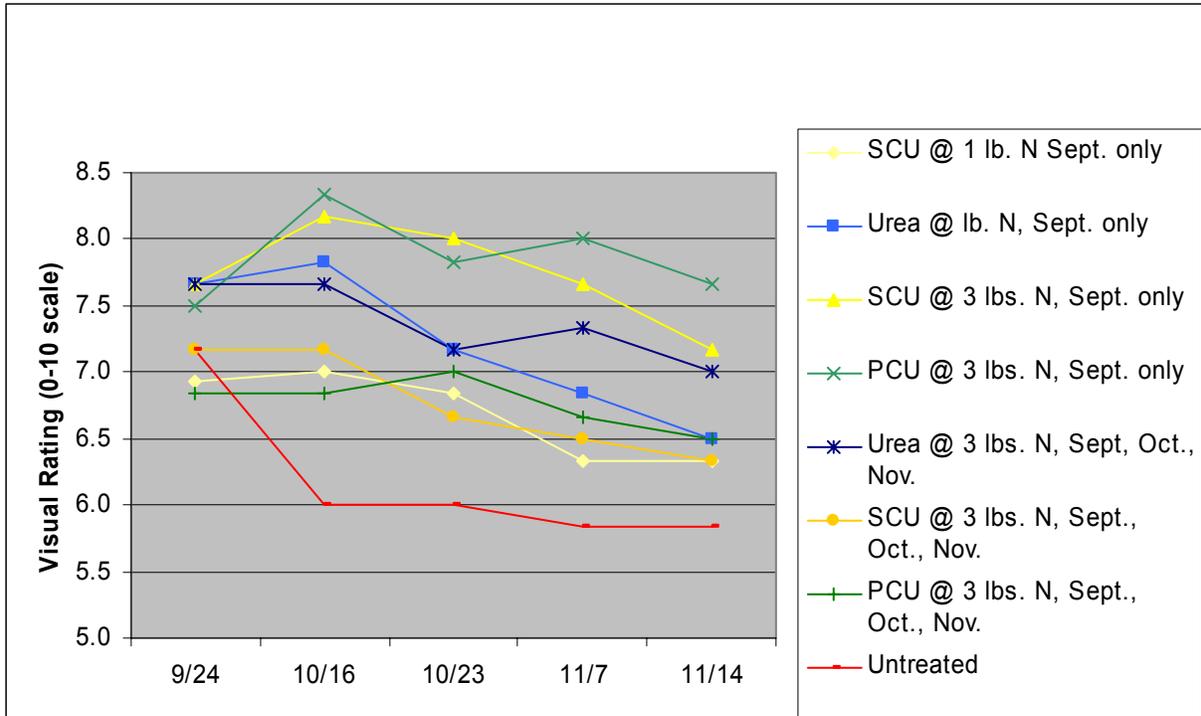


Figure 1. Kentucky bluegrass visual turfgrass quality as affected by three urea sources and application rates.

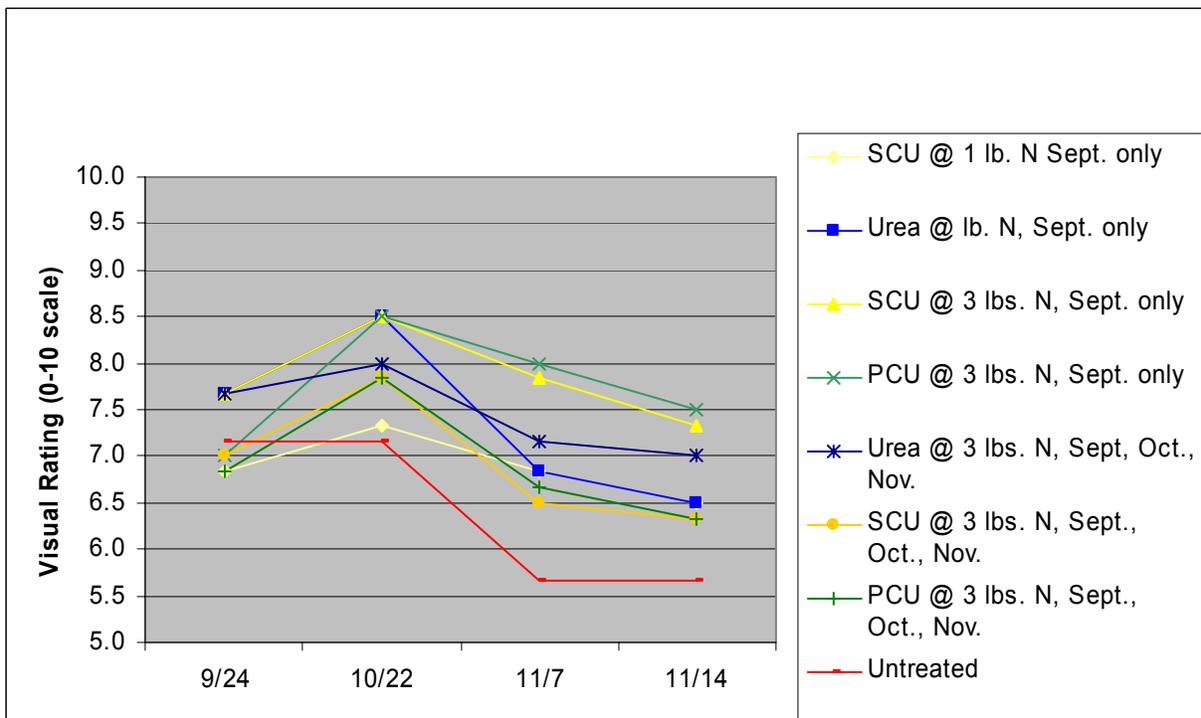


Figure 2. Kentucky bluegrass visual color ratings as affected by three urea sources and application rates.

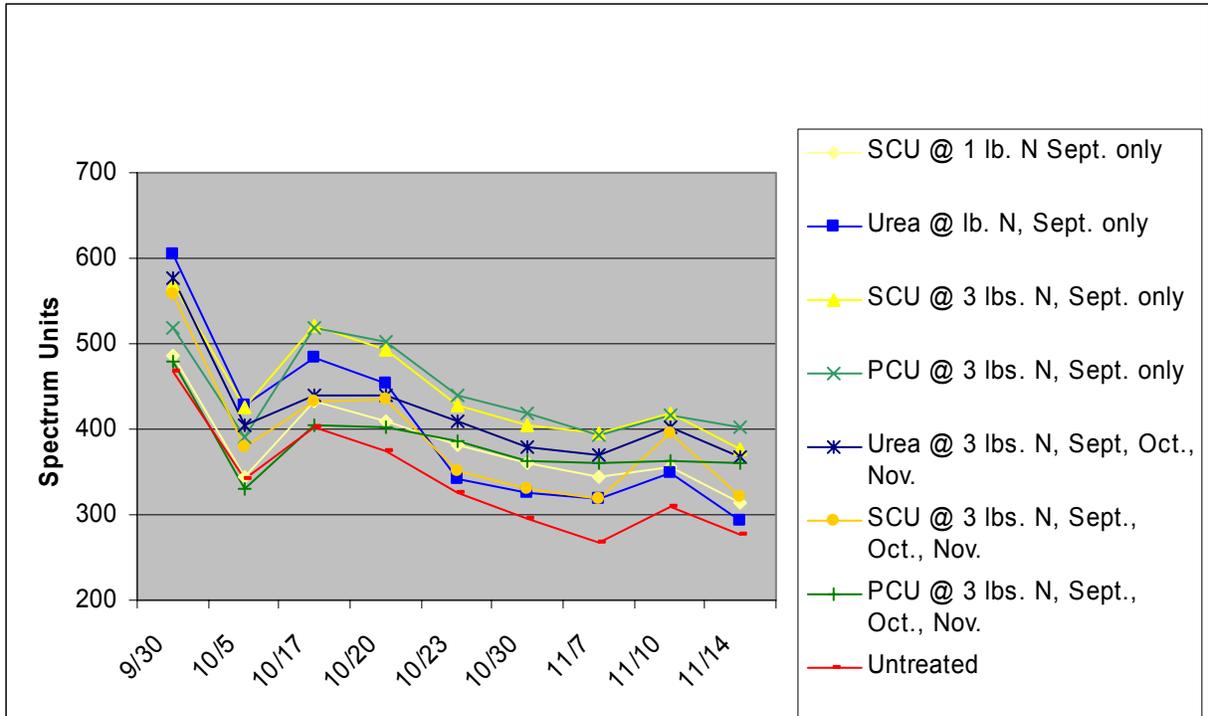


Figure 3. Kentucky bluegrass chlorophyll readings as affected by three urea sources and application rates.

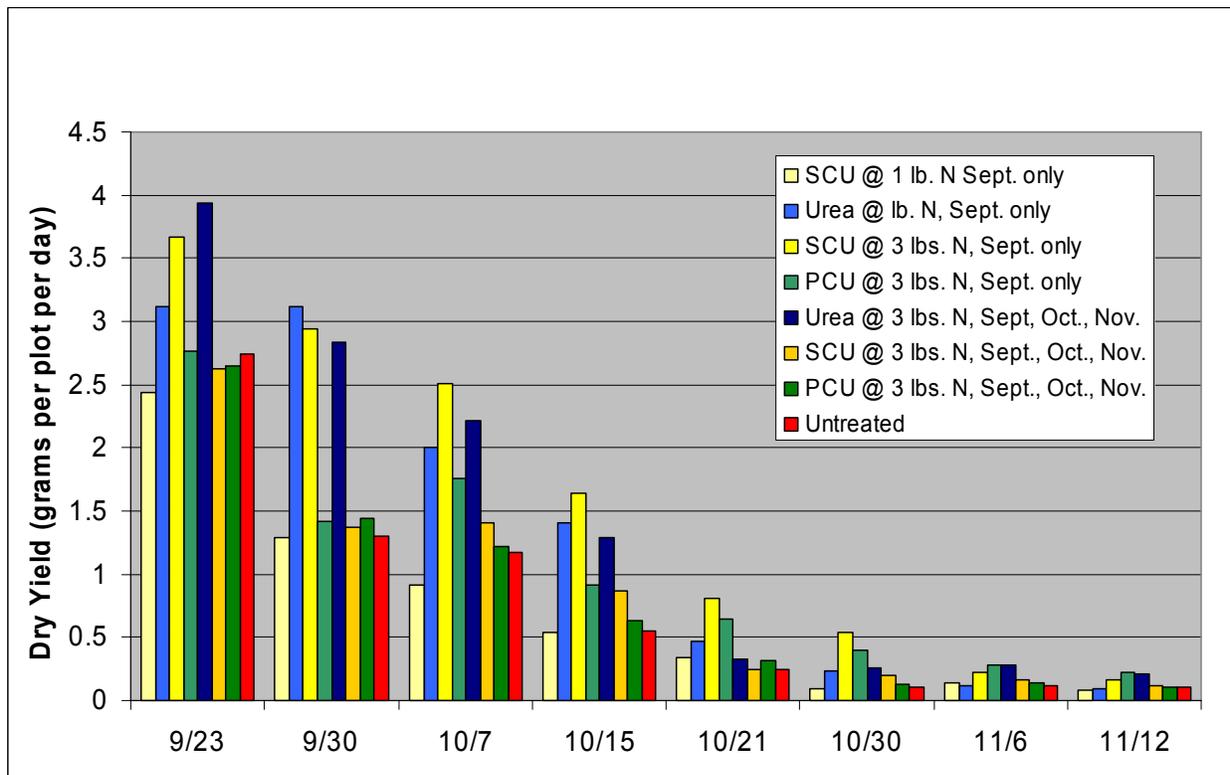


Figure 4. Kentucky bluegrass clipping yield as affected by three urea sources and application rates.