

Comparison of Polymer-coated Urea Fertilizers

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Introduction

The objective was to compare the nitrogen release rate and turf response to Polyon 44.5-0-0 and XCU 43-0-0 on Kentucky bluegrass turf maintained at lawn height.

Materials and Methods

The study was conducted at the Iowa State University Horticulture Research Station on a Nicollet soil with 5 ppm P, 112 ppm K, a pH of 7.05 and an organic matter content of 4.1 percent. Polyon 44.5-0-0 and XCU 43-0-0 were applied at 1 and 2 lb N/1,000 ft² to 'Unique' Kentucky bluegrass turf. Data collection began when first fertilizer response was observed on October 3 and continued through November 21. Data were visual evaluations of turf response to fertilizer based on quality, color, and uniformity of the individual plots, with 9 as the highest response and 1 as the lowest, with a rating of 6 required for acceptable.

Results and Discussion

Table 1 includes the visual response data collected following the application of treatments on September 17. The first visual response was observed 16 days later on October 3.

Ratings were made daily through October 6, then on October 8, 10, and 15. A final rating was made on November 21. The table includes the least significant difference at the 0.05 level of probability. Orthogonal contrasts also were performed on data from each date to compare XCU and Polyon at both rates of application (XCU vs. Poly), XCU at the 1-lb rate to Polyon at the 1-lb rate (XCU1 vs. Poly1), and XCU at the 2-lb rate to Polyon at the 2-lb rate (XCU2 vs. Poly2).

At first response on October 3, there were no significant differences among treatments. By October 4, there was an improved visual response on plots receiving the XCU at the 1 lb rate and the overall contrast of XCU and Polyon was different at the 0.05 level of significance, with the XCU providing the best rating. The XCU also provided the best response on October 6 and 8 at both rates of applications, based on the orthogonal contrasts. By October 10, all fertilizer treatments were better than the untreated control, but there were no differences among the fertilizer treatments.

On October 15, XCU vs. Poly contrast was different at the 0.05 level of significance, with the XCU providing the best response. There were no differences on November 21. The overall mean of the data showed the best response for the XCU at the 1-lb rate, but not at the 2-lb rate. The overall comparison of the means for XCU and Polyon showed the best response for XCU.

Table 1. Mean visual response ratings of Kentucky bluegrass (lawn height) to polymer-coated urea fertilizer.¹

No.	Treatment	Rate=lb N/1,000 ft ²	Date								Mean	
			Oct. 3	Oct. 4	Oct. 5	Oct. 6	Oct. 8	Oct. 10	Oct. 15	Oct. 21		
1	Control	-	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	6.0	5.3
2	XCU 43-0-0	1	5.8	6.6	6.8	6.8	7.4	7.4	7.4	7.6	8.0	7.1
3	Polyon 44.5-0-0	1	6.0	6.0	6.0	6.0	6.4	6.6	6.6	6.8	7.8	6.5
4	XCU 43-0-0	2	6.6	7.0	7.0	7.4	7.8	7.4	7.4	8.4	9.0	7.6
5	Polyon 44.5-0-0	2	6.2	6.6	6.6	6.6	7.0	7.2	7.2	7.6	9.0	7.1
	LSD 0.05	-	NS	0.7	0.7	0.8	0.8	1	1	1.1	0.3	0.6
	XCU vs. Poly		NS	*	**	**	**	NS	*	NS	NS	**
	XCU1 vs. Poly1		NS	NS	**	*	**	NS	NS	NS	NS	*
	XCU2 vs. Poly2		NS	NS	NS	*	*	NS	NS	NS	NS	NS

¹Visual response data where 9 is greatest response to fertilizer, 1 is no response, and a rating of 6 is required for acceptable. The LSD is the least significant difference among treatments.

*Statistically significant at P<0.05.

**Statistically significant at P<0.01.

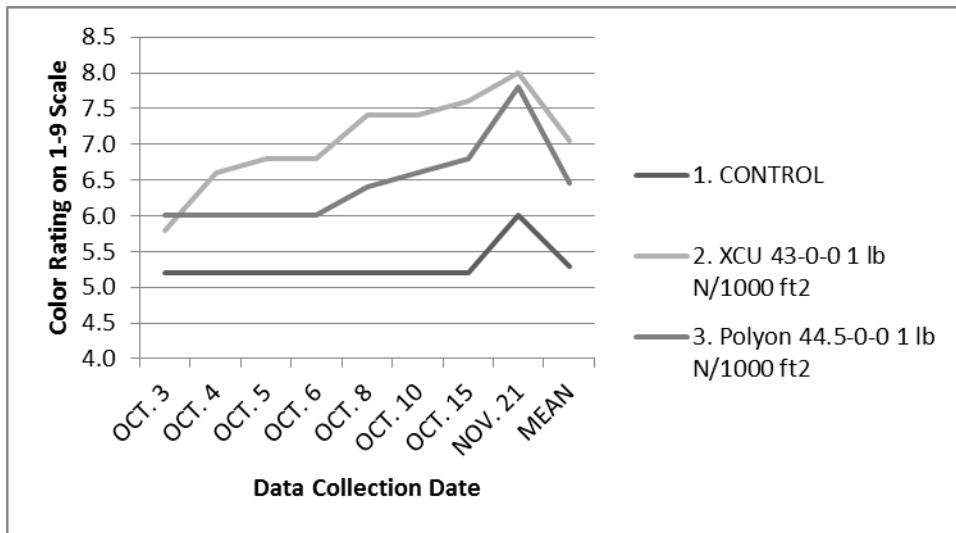


Figure 2. Fertilizer response of Kentucky bluegrass (lawn height) at 1 lb N/1,000 ft².

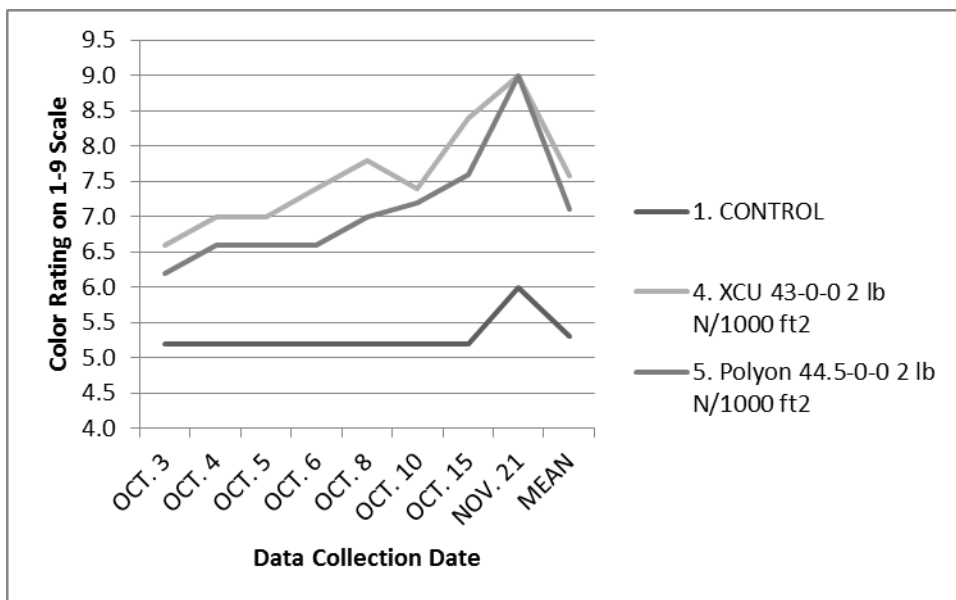


Figure 3. Fertilizer response of Kentucky bluegrass (lawn height) at 2 lb N/1,000 ft².