

The Evaluation of Various Fertilizers for Use on Turf

J. B. Ross and Mark A. Anderson

Objective of the trial

This objective of this trial was to assess various fertilizers from Agrium Advanced Technologies for various growth characteristics, specifically colour, quality and clipping yield.

Methodology

Plots were laid out on a Kentucky bluegrass/fescue area at the Prairie Turfgrass Research Centre located at Olds College, Olds, Alberta, Canada. Plot sizes were 1 by 2 metres and laid out in a Randomized Complete Block Design. The performance of the various fertilizers was compared against urea and an untreated control (UTC).

Rate of application of the fertilizers and the application interval is listed in Table 1. The initial application of fertilizer was applied on May 26 and then subsequent applications were made based on the intervals listed in the table 1 and 2. Application of the granular fertilizers was made using a Scott's drop spreader, which was calibrated to apply the appropriate amount of each fertilizer.

Table 1 – Product information, percent nitrogen, application interval and total nitrogen.

	%N	Application Rate lb N/1000ft ²	Application interval	Total N lb/1000ft ²
1 UTC	0			
2 Urea	46	0.5	Every 4 weeks	3.0
3 XCU 43-0-0 (100%)	43	0.85	Every 8 weeks	2.55
4 Blend with 50% XCU	44.5	0.85	Every 8 weeks	2.55
5 DURATION 4-month blend	44	1.5	Every 16 weeks	3.0
6 POLYON 4-month blend	44.5	1.5	Every 16 weeks	3.0
7 DURATION Season-Long blend	43.6	2.5	1 time	2.5
8 POLYON Season-Long blend	43.8	2.5	1 time	2.5
9 Poly-R	44	1.0	Every 12 weeks	2.0
10 SCU 39-0-0 (100%)	39	1.0	Every 8 weeks	2.0
11 Blend with 50% SCU 39-0-0	42.5	1.0	Every 8 weeks	3.0
12 SCU 39-0-0 (100%)	39	0.85	Every 8 weeks	2.55
13 Blend with 50% SCU 39-0-0	42.5	0.85	Every 8 weeks	2.55
14 Uflexx	46	1.0	Every 8 weeks	3.0
15 Umaxx	47	1.0	Every 12 weeks	2.0
16 SurfKote	44	1.5	Every 16 weeks	3.0

Table 2 – Actual application dates for the various products.

	Application Date
1 UTC	
2 Urea	May 26, June 16, July 14, Aug 11, Sept 8
3 XCU 43-0-0 (100%)	May 26, July 16 , Sept 8
4 Blend with 50% XCU	May 26, July 16 , Sept 8

5 DURATION 4-month blend	May 26, Aug 11
6 POLYON 4-month blend	May 26, Aug 11
7 DURATION Season-Long blend	May 26
8 POLYON Season-Long blend	May 26
9 Poly-R	May 26, Aug 11
10 SCU 39-0-0 (100%)	May 26, July 16 , Sept 8
11 Blend with 50% SCU 39-0-0	May 26, July 16 , Sept 8
12 SCU 39-0-0 (100%)	May 26, July 16 , Sept 8
13 Blend with 50% SCU 39-0-0	May 26, July 16 , Sept 8
14 Uflexx	May 26, July 16 , Sept 8
15 Umaxx	May 26, Aug 11
16 SurfKote	May 27, Sept 8

Colour and quality, as well as clipping yields, were rated weekly.

For colour ratings, 1 indicated a brown dormant turf and 9 indicated a dark green turf. The individual treatments were also assessed for superior colour, i.e. a treatment was considered superior when it had an 'a' ranking. Mean standard deviation, which is a measure of consistent colour, was also determined. A low value would indicate that there is a small amount of variation in the colour rating from week to week, whereas, a high value would indicate considerable variation.

Density was combined with colour to determine quality ratings. Density, which is a subjective rating of shoots per unit of area, was based on 1 was poor density and 9 was superior density. Mean standard deviation for quality was a measure of consistent quality from week to week. A high value would indicate a great amount of variation, while a low value would indicate little variation.

Clippings were collected with a reel mower that made one pass down the centre of each plot. Clippings were then dried for 48 hours at 70°C in a drying oven and weighed. Clipping yield values were recorded as grams of clippings per square meter per week. In order to determine the consistency of release of the various fertilizers the mean standard deviation was determined. Mean standard deviation is a measurement in grams of the deviation from the mean value based on the weekly clipping yields. A consistent release of nitrogen would result in low values for mean standard deviation.

Generated data was first analyzed using an Analysis of Variance (ANOVA) test. When statistically significant treatment differences are present, least significant difference (LSD) values are presented at the bottom of each table. Treatment differences that were greater than the LSD value indicate a strong probability that the differences were as a result of the treatment and did not occur by chance. Therefore, within a column, if the same letter follows numbers there is no significant difference between treatments.

Results

Weather data is reported separately in an Excel file. In addition, information is presented for each of the individual products in comparison to urea and the untreated control. These are presented as graphs in a separate Excel file.

As far as initial green-up (week 2) was concerned, urea, XCU 50% blend, SCU 100% (both rates), SCU 50% blend (both rates), Uflexx, Umaxx and SurfKote were the quickest to green-up (table 3). As far as consistently superior colour was concerned, the Polyon season long application, rated an 'a' 12 out of 17 weeks. Umaxx rated an 'a' 10 out of 17 weeks, while urea was rated an 'a' 9 out of 17 weeks. The untreated control always shows the least variation in colour. The fertilizer treatments that showed the most consistent colour (lowest values for mean standard deviation) were urea, and SCU 100% (0.85lb rate). Those fertilizers that showed the greatest fluctuation were Polyon 4-month blend and Umaxx.

Table 3 – Turfgrass colour for Agrium fertilizer trial, 2010.

	Interval	Week 1	Week 2	Week 3	Week 4
		1 – 9 scale			
Untreated control	none	6.0a	6.0c	5.7f	6.0e
Urea 0.5lb n/1000ft ²	4 wks	6.0a	7.0a	7.2abc	7.0c
XCU 43-0-0 (100%)	0.85lb N/1000ft ² 8 wks	6.0a	6.2bc	7.2abc	7.0c
Blend with 50% XCU	0.85lb N/1000ft ² 8 wks	6.0a	6.7ab	7.5ab	7.2bc
Duration 4-month blend	1.5lb N/1000ft ² 16 wks	6.0a	6.0c	6.5cdef	6.5d
Polyon 4-month blend	1.5lb N/1000ft ² 16 wks	6.0a	6.0c	7.2abc	7.0c
Duration Season-Long	2.5lb N/1000ft ² single	6.0a	6.2bc	6.2def	6.0e
Polyon Season-Long	2.5lb N/1000ft ² single	6.0a	6.2bc	8.0a	7.5b
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ² 12 wks	6.0a	6.0c	6.0ef	6.0e
SCU (100%)	1.0lb N/1000ft ² 8 wks	6.0a	7.0a	6.7bcde	7.0c
Blend with 50% SCU	1.0lb N/1000ft ² 8 wks	6.0a	7.0a	8.0a	7.0c
SCU (100%)	0.85lb N/1000ft ² 8 wks	6.0a	6.5abc	6.7bcde	7.0c
Blend with 50% SCU	0.85lb N/1000ft ² 8 wks	6.0a	7.0a	7.0bcd	7.0c
Uflexx	1.0lb N/1000ft ² 8 wks	6.0a	6.7ab	8.0a	7.2bc
Umaxx	1.0lb N/1000ft ² 12 wks	6.0a	7.0a	7.2abc	7.0c
SurfKote	1.5lb N/1000ft ² 16 wks	6.0a	7.0a	8.0a	8.0a
	LSD _{0.05} =	n/s	0.5	0.8	0.3
		1 – 9 scale			
	Interval	Week 5	Week 6	Week 7	Week 8
Untreated control	none	6.2c	6.2e	6.0f	6.0e
Urea 0.5lb n/1000ft ²	4 wks	7.2ab	7.5ab	7.7ab	7.2abc
XCU 43-0-0 (100%)	0.85lb N/1000ft ² 8 wks	7.0b	7.0cd	6.2ef	7.0bc
Blend with 50% XCU	0.85lb N/1000ft ² 8 wks	7.0b	7.2bc	6.5ef	7.5ab
Duration 4-month blend	1.5lb N/1000ft ² 16 wks	6.5c	7.0cd	7.2bc	7.0bc
Polyon 4-month blend	1.5lb N/1000ft ² 16 wks	7.0b	7.0cd	6.7cde	6.7cd
Duration Season-Long	2.5lb N/1000ft ² single	7.0b	7.2bc	7.0cd	7.0bc
Polyon Season-Long	2.5lb N/1000ft ² single	7.5a	7.7a	8.0a	7.7a
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ² 12 wks	6.5c	6.7d	6.7cde	6.2de
SCU (100%)	1.0lb N/1000ft ² 8 wks	7.0b	7.0cd	7.0cd	7.0bc
Blend with 50% SCU	1.0lb N/1000ft ² 8 wks	7.0b	7.0cd	6.7cde	7.0bc
SCU (100%)	0.85lb N/1000ft ² 8 wks	7.0b	7.0cd	6.7cde	7.0bc

Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.0b	7.0cd	6.7cde	7.2abc
Uflexx	1.0lb N/1000ft ²	8 wks	7.0b	7.0cd	7.0cd	7.7a
Umaxx	1.0lb N/1000ft ²	12 wks	7.0b	7.0cd	7.0cd	6.2de
SurfKote	1.5lb N/1000ft ²	16 wks	7.5a	7.2bc	7.0cd	6.7cd
LSD _{0.05} =			0.4	0.4	0.5	0.6

		Interval	Week 9	Week 10	Week 11	Week 12
			1 – 9 scale			
Untreated control		none	5.5d	5.7e	5.5d	5.5d
Urea 0.5lb n/1000ft ²		4 wks	7.0b	7.7abc	7.7ab	7.0c
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	7.5ab	7.7abc	8.0a	7.2bc
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	8.0a	8.2a	8.2a	7.0c
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.7a	8.0ab	7.7ab	7.7abc
Polygon 4-month blend	1.5lb N/1000ft ²	16 wks	6.2c	7.0d	7.2bc	8.0ab
Duration Season-Long	2.5lb N/1000ft ²	single	7.7a	8.0ab	7.7ab	7.2bc
Polygon Season-Long	2.5lb N/1000ft ²	single	8.0a	7.7abc	7.7ab	7.2bc
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.0b	7.2cd	7.2bc	7.2bc
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.7a	7.7abc	7.7ab	7.0c
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	8.0a	7.5bcd	8.0a	7.7abc
SCU (100%)	0.85lb N/1000ft ²	8 wks	8.0a	7.7abc	7.7ab	7.2bc
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	8.0a	7.5bcd	8.0a	7.5abc
Uflexx	1.0lb N/1000ft ²	8 wks	8.0a	8.0ab	8.2a	7.2bc
Umaxx	1.0lb N/1000ft ²	12 wks	6.2c	7.0d	7.0c	8.2a
SurfKote	1.5lb N/1000ft ²	16 wks	7.0b	7.2cd	7.0c	7.2bc
LSD _{0.05} =			0.7	0.5	0.6	0.7

		Interval	Week 13	Week 14	Week 15	Week 16
			1 – 9 scale			
Untreated control		none	5.5c	5.5d	5.5d	5.7e
Urea 0.5lb n/1000ft ²		4 wks	7.0b	7.2bc	7.0bc	7.0bcd
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	7.2b	7.2bc	7.2bc	7.2abc
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	7.2b	7.2bc	7.0bc	7.0bcd
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.2b	7.7b	7.5ab	7.5ab
Polygon 4-month blend	1.5lb N/1000ft ²	16 wks	8.0a	7.7b	8.0a	7.7a
Duration Season-Long	2.5lb N/1000ft ²	single	7.0b	7.0c	7.2bc	7.2abc
Polygon Season-Long	2.5lb N/1000ft ²	single	7.2b	7.5bc	7.5ab	7.5ab
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.0b	7.5bc	8.0a	7.7a
SCU (100%)	1.0lb N/1000ft ²	8 wks	6.7b	7.2bc	7.0bc	7.0bcd
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	6.7b	7.2bc	7.0bc	7.0bcd
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.0b	7.0c	7.5ab	7.0bcd
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.2b	7.5bc	6.7c	6.5d
Uflexx	1.0lb N/1000ft ²	8 wks	7.2b	7.0c	7.2bc	7.0bcd
Umaxx	1.0lb N/1000ft ²	12 wks	8.2a	8.5a	8.0a	7.5ab
SurfKote	1.5lb N/1000ft ²	16 wks	6.7b	7.0c	7.0bc	6.7cd
LSD _{0.05} =			0.5	0.6	0.5	0.6

		Interval	Week 17	Superior Turf Color Rating	Standard Deviation
			1 – 9 scale		
Untreated control		none	5.0c	1 out of 17 weeks	0.3
Urea 0.5lb n/1000ft ²		4 wks	6.7b	9 out of 17 weeks	0.4

XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	6.7b	6 out of 17 weeks	0.5
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	6.7b	7 out of 17 weeks	0.5
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.2ab	7 out of 17 weeks	0.6
Polygon 4-month blend	1.5lb N/1000ft ²	16 wks	7.7a	7 out of 17 weeks	0.7
Duration Season-Long	2.5lb N/1000ft ²	single	6.7b	5 out of 17 weeks	0.6
Polygon Season-Long	2.5lb N/1000ft ²	single	7.2ab	12 out of 17 weeks	0.6
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.0ab	4 out of 17 weeks	0.6
SCU (100%)	1.0lb N/1000ft ²	8 wks	6.7b	5 out of 17 weeks	0.4
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.0ab	7 out of 17 weeks	0.5
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.0ab	7 out of 17 weeks	0.5
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.0ab	7 out of 17 weeks	0.5
Uflexx	1.0lb N/1000ft ²	8 wks	7.0ab	8 out of 17 weeks	0.6
Umaxx	1.0lb N/1000ft ²	12 wks	7.0ab	10 out of 17 weeks	0.7
SurfKote	1.5lb N/1000ft ²	16 wks	6.7b	5 out of 17 weeks	0.5

LSD_{0.05} = 0.7

* Values that have the same letter as a suffix are not significantly different from each other.

Those fertilizers that showed the best overall quality (consistently rated an ‘a’) were Uflexx (11 out of 17 weeks), Polygon season long (10 out of 17 weeks), and XCU 50% blend (9 out of 17 weeks). Those fertilizers that showed consistent quality, as measured by mean standard deviation, were urea, XCU 100%, XCU 50% blend, Duration season long, SCU 100% (both rates) and SCU 50% blend (both rates).

Table 4 – Turfgrass quality ratings for Agrium fertilizer trial, 2010.

	Interval	Week 1	Week 2	Week 3	Week 4
		1 – 9 scale			
Untreated control	none	6.7a	7.0d	6.9g	7.0e
Urea 0.5lb n/1000ft ²	4 wks	6.7a	7.5ab	7.6bcd	7.5c
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	6.7a	7.2bcd	7.5cd
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	6.7a	7.3abcd	7.6bcd
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	6.7a	7.0d	7.0fg
Polygon 4-month blend	1.5lb N/1000ft ²	16 wks	6.7a	7.0d	7.6bcd
Duration Season-Long	2.5lb N/1000ft ²	single	6.7a	7.1cd	7.1efg
Polygon Season-Long	2.5lb N/1000ft ²	single	6.7a	7.2bcd	7.8abc
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	6.7a	7.0d	7.0fg
SCU (100%)	1.0lb N/1000ft ²	8 wks	6.7a	7.4abc	7.4de
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	6.7a	7.5ab	7.8abc
SCU (100%)	0.85lb N/1000ft ²	8 wks	6.7a	7.1cd	7.3def
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	6.7a	7.5ab	7.3def
Uflexx	1.0lb N/1000ft ²	8 wks	6.7a	7.4abc	7.9 ab
Umaxx	1.0lb N/1000ft ²	12 wks	6.7a	7.5ab	7.5 cd
SurfKote	1.5lb N/1000ft ²	16 wks	6.7a	7.6a	8.0a
		LSD _{0.05} =	n/s	0.3	0.3
					0.2
	Interval	Week 5	Week 6	Week 7	Week 8
		1 – 9 scale			
Untreated control	none	7.0c	7.0d	7.0a	7.0f
Urea 0.5lb n/1000ft ²	4 wks	7.5a	7.6a	7.9ab	7.6bcd
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	7.4a	7.4abc	7.2fg
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	7.4a	7.5ab	7.3ef
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.1bc	7.3bc	7.5cde

Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	7.4a	7.4abc	7.3ef	7.3def
Duration Season-Long	2.5lb N/1000ft ²	single	7.3ab	7.4abc	7.4def	7.5cd
Polyon Season-Long	2.5lb N/1000ft ²	single	7.5a	7.6a	8.0a	8.0a
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.1bc	7.2cd	7.4def	7.1ef
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.3ab	7.3bc	7.6cd	7.5cd
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.3ab	7.3bc	7.3ef	7.6bcd
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.3ab	7.3bc	7.4def	7.5cd
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.4a	7.4abc	7.4def	7.6bcd
Uflexx	1.0lb N/1000ft ²	8 wks	7.4a	7.4abc	7.7bc	7.9ab
Umaxx	1.0lb N/1000ft ²	12 wks	7.3ab	7.3bc	7.6cd	7.0f
SurfKote	1.5lb N/1000ft ²	16 wks	7.5a	7.4abc	7.7bc	7.5cd

LSD_{0.05} = 0.2 0.2 0.2 0.3

	Interval	Week 9	Week 10	Week 11	Week 12
		1 – 9 scale			
Untreated control	none	6.7g	6.7e	6.7d	6.6e
Urea 0.5lb n/1000ft ²	4 wks	7.6bcd	8.0bc	7.8abc	7.7cd
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	7.7abcd	8.1ab	8.0a
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	8.0ab	8.1ab	8.0a
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.8abcd	8.0bc	7.8abc
Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	7.1efg	7.7d	7.6bc
Duration Season-Long	2.5lb N/1000ft ²	single	7.6bcd	8.0bc	7.7abc
Polyon Season-Long	2.5lb N/1000ft ²	single	8.1a	8.0bc	7.9ab
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.5cde	7.7d	7.5c
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.8abcd	8.1ab	7.8abc
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.9abc	7.9bcd	8.0a
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.9abc	7.9bcd	7.8abc
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.9abc	7.9bcd	7.9ab
Uflexx	1.0lb N/1000ft ²	8 wks	8.0ab	8.3a	8.0a
Umaxx	1.0lb N/1000ft ²	12 wks	7.0fg	7.7d	7.5c
SurfKote	1.5lb N/1000ft ²	16 wks	7.4def	7.8cd	7.5c

LSD_{0.05} = 0.4 0.2 0.3 0.2

	Interval	Week 13	Week 14	Week 15	Week 16
		1 – 9 scale			
Untreated control	none	6.5d	6.6d	6.5c	6.8d
Urea 0.5lb n/1000ft ²	4 wks	7.7c	7.7bc	7.7b	7.7abc
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	7.7c	7.7bc	7.7b
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	7.7c	7.7bc	7.7b
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	7.7c	7.9b	7.8ab
Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	8.0b	7.9b	8.0a
Duration Season-Long	2.5lb N/1000ft ²	single	7.7c	7.6c	7.7b
Polyon Season-Long	2.5lb N/1000ft ²	single	7.7c	7.8bc	7.8b
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.7c	7.8bc	8.0ab
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.6c	7.7bc	7.7b
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.6c	7.7bc	7.7b
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.7c	7.6c	7.8ab
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.7c	7.8bc	7.6b
Uflexx	1.0lb N/1000ft ²	8 wks	7.7c	7.7bc	7.7b
Umaxx	1.0lb N/1000ft ²	12 wks	8.3a	8.2a	8.0a
SurfKote	1.5lb N/1000ft ²	16 wks	7.5c	7.7bc	7.7b

LSD_{0.05} = 0.2 0.2 0.2 0.3

	Interval	Week 17	Superior Turf Quality Rating	Standard Deviation	
		1 – 9 scale	mean of three quality factors		
Untreated control	none	6.3c	2 out of 17 weeks	0.2	
Urea 0.5lb n/1000ft ²	4 wks	7.6b	7 out of 17 weeks	0.3	
XCU 43-0-0 (100%) 0.85lb N/1000ft ²	8 wks	7.6b	7 out of 17 weeks	0.3	
Blend with 50% XCU 0.85lb N/1000ft ²	8 wks	7.6b	9 out of 17 weeks	0.3	
Duration 4-month blend 1.5lb N/1000ft ²	16 wks	7.7ab	6 out of 17 weeks	0.4	
Polygon 4-month blend 1.5lb N/1000ft ²	16 wks	7.9ab	7 out of 17 weeks	0.4	
Duration Season-Long 2.5lb N/1000ft ²	single	7.7ab	6 out of 17 weeks	0.3	
Polygon Season-Long 2.5lb N/1000ft ²	single	7.7ab	10 out of 17 weeks	0.4	
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	7.7ab	4 out of 17 weeks	0.4
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.7ab	8 out of 17 weeks	0.3
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.7ab	8 out of 17 weeks	0.3
SCU (100%)	0.85lb N/1000ft ²	8 wks	7.7ab	7 out of 17 weeks	0.3
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.7ab	7 out of 17 weeks	0.3
Uflexx	1.0lb N/1000ft ²	8 wks	8.0a	11 out of 17 weeks	0.4
Ummax	1.0lb N/1000ft ²	12 wks	8.0a	9 out of 17 weeks	0.5
SurfKote	1.5lb N/1000ft ²	16 wks	7.6b	6 out of 17 weeks	0.3

LSD_{0.05} = 0.3

* Values that have the same letter as a suffix are not significantly different from each other.

The highest initial growth as measured by clipping yield was achieved by Uflexx, Ummax, SurfKote, and urea. As far as total yield was concerned, the urea had the highest clipping yield followed by Uflexx and Polygon season long. Urea produced the highest yields from week to week, while Uflexx was the next highest. The fertilizer that showed the least fluctuation in clipping yield was Duration 4-month blend, while those that showed the greatest fluctuation in clipping yield was Urea and Uflexx.

Table 4 – Clipping yield for Agrium fertilizer trial, 2010.

	Interval	Week 1	Week 2	Week 3	Week 4	
		g/m ²				
Untreated control	none	9.4a	7.3g	3.7h	1.6e	
Urea 0.5lb n/1000ft ²	4 wks	11.6a	14.2abc	11.8bcde	6.2bc	
XCU 43-0-0 (100%) 0.85lb N/1000ft ²	8 wks	10.9a	12.7bcd	12.7bcd	6.4b	
Blend with 50% XCU 0.85lb N/1000ft ²	8 wks	10.2a	11.2cdef	10.6bcdefg	4.7bcd	
Duration 4-month blend 1.5lb N/1000ft ²	16 wks	8.4a	7.7g	7.1gh	3.8bcde	
Polygon 4-month blend 1.5lb N/1000ft ²	16 wks	9.7a	8.9efg	9.3cdefg	5.5bcd	
Duration Season-Long 2.5lb N/1000ft ²	single	10.9a	8.3fg	7.7fgh	3.0de	
Polygon Season-Long 2.5lb N/1000ft ²	single	8.3a	9.7defg	10.3cdefg	6.1bc	
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	9.1a	8.5fg	6.9gh	3.1de
SCU (100%)	1.0lb N/1000ft ²	8 wks	9.9a	10.2defg	8.8defg	3.0de
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	11.2a	11.7cde	11.6bcdef	6.3b
SCU (100%)	0.85lb N/1000ft ²	8 wks	8.3a	9.7defg	8.5efg	3.5cde
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	12.9a	13.6abc	13.1bc	6.0bc
Uflexx	1.0lb N/1000ft ²	8 wks	12.9a	16.3a	14.4ab	9.3a
Ummax	1.0lb N/1000ft ²	12 wks	11.4a	15.4ab	11.4bcdef	6.0bc
SurfKote	1.5lb N/1000ft ²	16 wks	12.6a	15.2ab	18.2a	10.3a

LSD_{0.05} = n/s 3.0 4.0 2.7

		Interval	Week 5	Week 6	Week 7	Week 8
			g/m^2			
Untreated control		none	2.4c	3.5g	1.9d	3.0g
Urea	0.5lb n/1000ft ²	4 wks	14.3a	27.1a	14.8a	33.9a
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	4.2c	12.0bcde	4.3bcd	13.4de
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	3.1c	10.3defg	4.3bcd	15.6cd
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	1.6c	8.3cdef	5.6b	10.3ef
Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	3.9c	13.3defg	4.7bcd	8.9ef
Duration Season-Long	2.5lb N/1000ft ²	single	2.4c	8.8fg	5.3bc	13.3de
Polyon Season-Long	2.5lb N/1000ft ²	single	10.2b	23.6a	14.9a	22.2b
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	1.8c	8.0defg	5.1bcd	10.4ef
SCU (100%)	1.0lb N/1000ft ²	8 wks	2.0c	5.8fg	2.0cd	10.1ef
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	3.8c	9.2cdef	4.8bcd	15.1cd
SCU (100%)	0.85lb N/1000ft ²	8 wks	1.8c	6.0fg	1.8d	10.2ef
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	3.7c	7.2efg	3.3bcd	13.1de
Uflexx	1.0lb N/1000ft ²	8 wks	4.5c	12.2bcd	4.4bcd	19.0bc
Umaxx	1.0lb N/1000ft ²	12 wks	3.5c	7.5defg	3.5bcd	7.2fg
SurfKote	1.5lb N/1000ft ²	16 wks	8.7b	16.0b	6.0b	11.6def

LSD_{0.05} = 3.2 4.9 3.3 4.6

		Interval	Week 9	Week 10	Week 11	Week 12
			g/m^2			
Untreated control		none	1.7j	3.1i	2.0f	1.9f
Urea	0.5lb n/1000ft ²	4 wks	24.4a	28.0ab	11.5a	19.8a
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	15.5cd	21.8bc	10.1ab	17.2ab
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	18.8bc	27.5ab	10.6a	17.9ab
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	6.1ghi	6.1ghi	3.2def	8.8de
Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	4.3hij	4.2hi	1.9f	7.7e
Duration Season-Long	2.5lb N/1000ft ²	single	10.1efg	11.9defg	6.0cd	12.5cd
Polyon Season-Long	2.5lb N/1000ft ²	single	13.9de	18.0cd	9.0ab	17.0ab
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	5.0hij	6.1ghi	2.8ef	9.2de
SCU (100%)	1.0lb N/1000ft ²	8 wks	10.0efg	10.4efgh	4.2def	10.7cde
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	13.8de	16.8cde	7.3bc	14.7bc
SCU (100%)	0.85lb N/1000ft ²	8 wks	8.0fgh	8.4fghi	3.3def	9.1de
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	12.3def	13.6def	5.6cde	10.5cde
Uflexx	1.0lb N/1000ft ²	8 wks	21.2ab	28.7a	11.7a	18.0ab
Umaxx	1.0lb N/1000ft ²	12 wks	2.6ij	2.8i	2.4f	10.6cde
SurfKote	1.5lb N/1000ft ²	16 wks	7.1gh	8.3fghi	3.1def	8.5de

LSD_{0.05} = 4.3 6.5 2.9 4.2

		Interval	Week 13	Week 14	Week 15	Week 16
			g/m^2			
Untreated control		none	2.5h	1.8g	2.4d	1.8h
Urea	0.5lb n/1000ft ²	4 wks	16.5a	12.5cde	8.7a	9.5ab
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	13.6abcd	7.9cde	3.8cd	9.2ab
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	12.2bcde	8.7bcd	4.1cd	6.6cdefg
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	9.7efg	7.9cde	4.5cd	7.6bcde
Polyon 4-month blend	1.5lb N/1000ft ²	16 wks	11.3bcdef	11.4a	8.3ab	11.4a
Duration Season-Long	2.5lb N/1000ft ²	single	10.6cdefg	6.8def	4.2cd	5.4defg
Polyon Season-Long	2.5lb N/1000ft ²	single	14.0abc	8.1bcde	6.1bc	7.2bcdef
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	8.7fg	6.8def	4.3cd	8.6bc

SCU (100%)	1.0lb N/1000ft ²	8 wks	9.1efg	8.1bcde	2.7d	6.0defg
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	10.3defg	6.8def	4.4cd	5.5defg
SCU (100%)	0.85lb N/1000ft ²	8 wks	8.6fg	4.9f	2.3d	4.9fg
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	9.2efg	5.4f	2.3d	5.2efg
Uflexx	1.0lb N/1000ft ²	8 wks	13.4abcd	10.2abc	4.6cd	7.7bcd
Umaxx	1.0lb N/1000ft ²	12 wks	14.6ab	10.4ab	5.5c	9.1ab
SurfKote	1.5lb N/1000ft ²	16 wks	7.6g	5.7ef	2.5d	4.5g
LSD _{0.05} =			3.4	2.4	2.3	2.4

		Interval	Week 17 g/m ²	Total Yield g	Superior Dry Yield weeks	Standard Deviation g
Untreated control		none	3.0g	53	1 / 17	2
Urea	0.5lb n/1000ft ²	4 wks	9.7ab	279	14 / 17	8
XCU 43-0-0 (100%)	0.85lb N/1000ft ²	8 wks	8.1bcdef	183	5 / 17	5
Blend with 50% XCU	0.85lb N/1000ft ²	8 wks	8.5abcdef	184	4 / 17	6
Duration 4-month blend	1.5lb N/1000ft ²	16 wks	9.3abc	116	2 / 17	2
Polygon 4-month blend	1.5lb N/1000ft ²	16 wks	10.2a	134	5 / 17	3
Duration Season-Long	2.5lb N/1000ft ²	single	7.1def	134	1 / 17	3
Polygon Season-Long	2.5lb N/1000ft ²	single	8.7abcde	207	6 / 17	5
Poly-R 1lb n/1000ft ²	1.0lb N/1000ft ²	12 wks	10.5a	135	2 / 17	3
SCU (100%)	1.0lb N/1000ft ²	8 wks	7.4cdef	120	1 / 17	3
Blend with 50% SCU	1.0lb N/1000ft ²	8 wks	7.9bcdef	161	1 / 17	4
SCU (100%)	0.85lb N/1000ft ²	8 wks	6.7ef	106	1 / 17	3
Blend with 50% SCU	0.85lb N/1000ft ²	8 wks	7.2def	144	2 / 17	4
Uflexx	1.0lb N/1000ft ²	8 wks	9.1abcd	217	11 / 17	6
Umaxx	1.0lb N/1000ft ²	12 wks	9.3abc	133	6 / 17	4
SurfKote	1.5lb N/1000ft ²	16 wks	6.6f	152	4 / 17	4
LSD _{0.05} =			2.0			

* Values that have the same letter as a suffix are not significantly different from each other.