The Evaluation of Various Controlled Release Fertilizers for Use on Turf

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Summary

The objective of this trial was to evaluate various fertilizers for their effect on the growth of Kentucky bluegrass/fescue turf. The summer of 2003 was not considered typical for the Canadian Prairie Provinces. May was cold and wet, while June, July, August and September had above normal temperatures and below normal precipitation. Colour ratings were determined in order to evaluate initial green-up following application of the fertilizers. In addition, colour ratings provided an evaluation of how consistently the fertilizer released its nitrogen when compared with the untreated control. Those fertilizers that consistently showed superior green-up after each fertilizer application were AGI #1, AGI #2, AGI #3, AGI #4, AGI #7, AGI #8 and the Poly Plus Fairway Program. Those fertilizers that consistently were the best or equal to the best for colour over all the rating dates were AGI #1, AGI #3, AGI #4, AGI #7 and the Poly Plus Fairway Program. Quality ratings were determined on a weekly basis. The fertilizers that consistently were the best or equal to the best were AGI #3, AGI #4, and AGI #8. In addition, AGI #7 and the Poly Plus Fairway Program were the best or equal to the best on 14 out of 15 rating dates. The fertilizers that consistently were the best or equal to the best for clipping yield were AGI #1, AGI #4 and AGI #8. The fertilizers that produced the greatest amount of clippings over the 15 week period were in descending order, AGI #8, AGI #4, and AGI #1.

Introduction

Previous research conducted at the Prairie Turfgrass Research Centre has shown that temperature is one of the greatest factors in determining the nitrogen release pattern of fertilizers. The research has shown that, because of our cool climate, fertilizers may react very differently than what is reported from other areas of North America. This trial was initiated in order to evaluate various fertilizers for their effects on growth within the cool climate of Alberta.

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 1.5 by 5 metres and laid out in a Randomized Complete Block Design. Individual treatments were replicated four times and were compared against an unfertilized control. Applications of the fertilizers were made approximately six weeks apart on May 26, July 2 and August 13. Application rates were 0.4kg N/100 m^2. Applications of the granular fertilizers were made using a Gandy drop spreader, which was calibrated for each fertilizer to apply the appropriate amount. The liquid products were applied with a compressed air plots sprayer. The sprayer was equipped with TeeJet 8004 nozzles and was calibrated to apply 5.7 litres/100m^2.

Colour and quality, as well as clipping yields, were rated weekly. The National Turfgrass Evaluation Program system of rating was used for colour and quality. In this study, 1 indicated a brown dormant turf and 9 indicated a dark green turf colouration. Density and area cover were combined with colour to determine quality ratings. Density ratings are 1 is poor density and 9 is superior density. Density is a subjective rating of shoots per unit area. The area cover rating is described as the area covered by turf and is rated on a 1-9 basis where 9 equals complete cover and 1 indicates a complete lack of cover. Bare areas and/or weed encroachment reduced the rating values. Clippings were collected with a reel mower that made one pass down the centre of each plot. Clippings were dried for 48 hours and weighed to give a value for clipping yield.

Results were evaluated based on those fertilizers that consistently performed the best. 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.

In addition, the data that shows superior colour, quality and clipping yield was evaluated by determining how many weeks the particular fertilizer was either the best or equal to the best fertilizer. This is indicated by the frequency of superior ranking or superior clipping yield. Total clipping yield was determined by adding clipping yields from all 15 weeks.

Table 1- Treatment schedule for fertilizer trial, 2003.

Product Name	Nutrient analysis
Unfertilized control	N/A
AGI Turf Formulation #1	12-2-10
AGI Turf Formulation #2	12-2-10
AGI Turf Formulation #3	12-2-10
AGI Turf Formulation #4	12-2-10
AGI Turf Formulation #7	20-2-3
AGI Turf Formulation #8	20-2-6
AGI Turf Formulation #9	25-2-4
AGI Turf Formulation #10	25-2-4
Scott's Fairway Builder	24-6-12
Scott's Super Fairway	25-4-10
Nu-Gro Fairway	20-10-15
Par-Ex Fairway	24-4-12
Ground Keeper	10-3-3
Evergro GTO w/Meso	24-4-20
Poly-Plus Fairway Program	1st and 2nd app. 24-5-11 3rd app. 21-3-21

Results

The summer of 2003 was not typical for the Canadian Prairie Provinces. May was cold and wet, while June, July, August and September had above normal temperatures and below normal precipitation. Normally, the turf greens up in mid-April and minimal growth occurs until a flush of growth occurs in late May to early June. After a three to four week flush of growth, plants will reduce their growth until the cool periods of fall when growth slows further. This year the growth flush was late in the spring.

Colour ratings were determined in order to evaluate initial green-up following application of the fertilizers. In addition, colour ratings provided an evaluation of how consistently the fertilizer released its nitrogen when compared with the untreated control (Table 2). Those fertilizers that consistently showed superior green-up after each fertilizer application were AGI #1, AGI #2, AGI #3, AGI #4, AGI #7, AGI #8 and the Poly Plus Fairway Program. Those fertilizers that

consistently were the best or equal to the best were AGI #1, AGI #3, AGI #4, AGI #7 and the Poly Plus Fairway Program.

Table 2 – Kentucky bluegrass/fescue trial colour ratings, 2003.

Turf Colour	June 3	June 10	June 17
Untreated	6.50 E	5.75 F	6.00 F
AGI Turf 1	7.75 AB	7.75 AB	7.75 AB
AGI Turf 2	8.00 A	7.50 ABC	7.50 ABC
AGI Turf 3	8.00 A	8.00 A	8.00 A
AGI Turf 4	8.00 A	8.00 A	8.00 A
AGI Turf 7	8.00 A	7.75 AB	8.00 A
AGI Turf 8	8.00 A	8.00 A	8.00 A
AGI Turf 9	7.75 AB	7.75 AB	7.50 ABC
AGI Turf 10	7.75 AB	7.75 AB	7.25 BCD
Scott's Fairway Builder	7.75 AB	7.50 ABC	7.50 ABC
Scott's Super Fairway	7.50 ABC	7.00 CD	7.00 CDE
Nu-Gro Fairway	7.00 CDE	7.25 BCD	6.75 DE
Par-Ex Fairway	7.50 ABC	6.75 DE	6.75 DE
Ground Keeper	6.75 DE	6.25 EF	6.00 F
Evergro GTO W/ Meso	7.00 CDE	7.25 BCD	6.50 EF
Poly Plus Fairway Program	7.50 ABC	8.00 A	8.00 A
LSD_{05} =	0.58	0.67	0.56

*Values followed by the same letter are not significantly different at p=0.05.

Turf Colour	June 24	July 2	July 8
Untreated	5.50 E	5.75 C	5.00 G
AGI Turf 1	7.00 AB	6.50 ABC	7.00 ABC
AGI Turf 2	7.00 AB	6.25 ABC	7.00 ABC
AGI Turf 3	7.00 AB	6.75 AB	7.00 ABC
AGI Turf 4	7.25 A	6.25 ABC	7.25 AB
AGI Turf 7	7.50 A	6.50 ABC	7.50 A
AGI Turf 8	7.25 A	7.00 A	7.50 A
AGI Turf 9	6.50 BC	6.50 ABC	6.25 CDEF
AGI Turf 10	6.50 BC	6.25 ABC	6.00 DEF
Scott's Fairway Builder	7.25 A	6.50 ABC	6.00 DEF
Scott's Super Fairway	6.50 BC	6.25 ABC	6.00 DEF
Nu-Gro Fairway	5.75 DE	6.00 BC	5.75 EFG
Par-Ex Fairway	6.25 CD	5.75 C	6.00 DEF
Ground Keeper	5.25 E	6.00 BC	5.75 EFG
Evergro GTO W/ Meso	5.50 E	6.50 ABC	6.50 BCDE
Poly Plus Fairway Program	7.50 A	7.00 A	6.75 ABCD
LSD_{05} =	0.72	0.76	0.75

*Values followed by the same letter are not significantly different at p=0.05.

Turf Colour	July 15	July 22	July 29
Untreated	5.00 C	5.25 F	5.50 E
AGI Turf 1	7.00 A	6.75 ABCD	8.00 A
AGI Turf 2	7.25 A	6.75 ABCD	7.75 AB
AGI Turf 3	7.75 A	7.25 AB	8.00 A
AGI Turf 4	7.00 A	7.50 A	8.00 A
AGI Turf 7	7.75 A	7.25 AB	8.00 A
AGI Turf 8	7.75 A	7.25 AB	8.00 A
AGI Turf 9	7.25 A	6.50 ABCD	7.50 ABC
AGI Turf 10	7.75 A	6.75 BCDE	8.00 A
Scott's Fairway Builder	7.25 A	6.50 CDE	7.75 AB
Scott's Super Fairway	7.50 A	6.50 EF	7.50 ABC
Nu-Gro Fairway	7.50 A	5.75 F	7.00 BCD
Par-Ex Fairway	5.25 C	6.25 EF	7.50 ABC
Ground Keeper	5.50 BC	5.75 EF	6.75 CD
Evergro GTO W/ Meso	6.75 AB	5.75 EF	7.50 ABC
Poly Plus Fairway Program	7.50 A	6.75 ABCD	8.00 A
LSD_{05} =	1.40	0.93	0.93

*Values followed by the same letter are not significantly different at p=0.05.

Turf Colour	Aug 5	Aug 12	Aug 19
Untreated	6.25 D	5.75 D	5.25 D
AGI Turf 1	8.00 A	6.75 ABC	8.00 ABC
AGI Turf 2	7.75 AB	7.00 AB	8.25 AB
AGI Turf 3	7.25 ABC	7.25 A	8.75 A
AGI Turf 4	7.50 ABC	7.25 A	8.75 A
AGI Turf 7	7.75 AB	7.25 A	8.00 ABC
AGI Turf 8	7.75 AB	6.75 ABC	8.75 A
AGI Turf 9	7.50 ABC	7.00 AB	8.00 ABC
AGI Turf 10	7.75 AB	7.00 AB	8.00 ABC
Scott's Fairway Builder	7.75 AB	6.75 ABC	8.00 ABC
Scott'sSuper Fairway	7.25 ABC	6.25 CD	8.00 ABC
Nu-Gro Fairway	7.00 BCD	6.75 ABC	7.25 C
Par-Ex Fairway	7.75 AB	7.00 AB	8.50 A
Ground Keeper	7.50 ABC	7.25 A	7.25 C
Evergro GTO W/ Meso	7.25 ABC	6.50 BC	7.50 BC
Poly Plus Fairway Program	7.75 AB	7.25 A	8.00 ABC
LSD_{05} =	0.76	0.67	0.81

*Values followed by the same letter are not significantly different at p=0.05.

Turf Colour	Aug 26	Sept 2	Sept 9
Untreated	5.25 D	5.00 F	6.00 E
AGI Turf 1	8.00 A	7.25 ABC	7.50 AB
AGI Turf 2	7.25 B	7.25 ABC	7.25 ABC
AGI Turf 3	8.00 A	7.75 A	7.75 A
AGI Turf 4	8.00 A	7.50 AB	7.75 A
AGI Turf 7	7.75 AB	7.25 ABC	7.75 A
AGI Turf 8	8.00 A	7.50 AB	7.75 A
AGI Turf 9	7.25 B	7.25 ABC	7.25 ABC
AGI Turf 10	7.25 B	7.00 ABCD	7.25 ABC
Fairway Builder	7.75 AB	7.50 AB	7.25 ABC
Super Fairway	7.25 B	7.50 AB	7.75 A
Nu-Gro Fairway	6.25 C	6.50 CDE	6.75 CD
Par-Ex Fairway	7.50 AB	7.75 A	7.75 A
Ground Keeper	6.50 C	6.25 DE	7.25 ABC
Evergro GTO W/ Meso	6.25 C	6.75 BCDE	6.75 CD
Poly Plus Fairway Program	8.00 A	7.25 ABC	7.75 A
LSD_{05} =	0.64	0.75	0.71

*Values followed by the same letter are not significantly different at p=0.05.

Turf Colour	Frequency of Superior Ranking
Untreated	0
AGI Turf 1	15
AGI Turf 2	14
AGI Turf 3	15
AGI Turf 4	15
AGI Turf 7	15
AGI Turf 8	15
AGI Turf 9	12
AGI Turf 10	10
Scott's Fairway Builder	13
Scott's Super Fairway	8
Nu-Gro Fairway	2
Par-Ex Fairway	8
Ground Keeper	2
Evergro GTO W/ Meso	4
Poly Plus Fairway Program	15

Quality ratings were also determined on a weekly basis. The fertilizers that consistently were the best or equal to the best were AGI #3, AGI #4, and AGI #8 (Table 3). In addition, AGI #7 and the Poly Plus Fairway Program were the best or equal to the best on 14 out of 15 rating dates.

Table 3 – Kentucky bluegrass/fescue trial quality ratings, 2003.

Overall Turf Quality	June 3	June 10	June 17
Untreated	6.15 E	5.93 F	6.18 G
AGI Turf 1	6.78 ABC	7.15 ABC	7.23 AB
AGI Turf 2	6.70 ABC	7.078ABCD	7.08 ABC
AGI Turf 3	6.78 ABC	7.23 AB	7.23 AB
AGI Turf 4	6.93 A	7.23 AB	7.23 AB
AGI Turf 7	6.78 ABC	7.23 AB	7.30 A
AGI Turf 8	6.93 A	7.30 A	7.30 A
AGI Turf 9	6.75 ABC	7.00 ABCD	7.00 ABCD
AGI Turf 10	6.78 ABC	7.08 ABCD	7.08 ABC
Scott's Fairway Builder	6.60 ABCD	7.08 ABCD	7.08 ABC
Scott's Super Fairway	6.50 BCDE	6.75 CD	6.83 CDE
Nu-Gro Fairway	6.48 BCDE	6.68 DE	6.58 EF
Par-Ex Fairway	6.40 CDE	6.75 CD	6.78 CDE
Ground Keeper	6.25 DE	6.25 EF	6.25 FG
Evergro GTO W/ Meso	6.48 BCDE	6.83 BCD	6.68 DE
Poly Plus Fairway Program	6.65 ABCD	7.23 AB	7.23 AB
LSD_{05} =	0.41	0.44	0.39

*Values followed by the same letter are not significantly different at p=0.05.

Overall Turf Quality	June 24	July 2	July 8
Untreated	6.00 GH	6.18 C	5.75 G
AGI Turf 1	6.68 ABCD	6.58 ABC	6.93 ABCD
AGI Turf 2	6.78 ABC	6.50 ABC	6.85 ABCD
AGI Turf 3	6.65 ABCD	6.60 ABC	6.83 ABCDE
AGI Turf 4	6.75 ABC	6.43 ABC	7.08 AB
AGI Turf 7	6.85 AB	6.65 AB	7.00 ABC
AGI Turf 8	6.93 A	6.83 A	7.15 A
AGI Turf 9	6.30 DEFG	6.50 ABC	6.75 ABCDE
AGI Turf 10	6.50 BCDE	6.40 ABC	6.53 CDEF
Scott's Fairway Builder	6.75 ABC	6.68 AB	6.43 EF
Scott's Super Fairway	6.50 BCDE	6.40 ABC	6.45 DEF
Nu-Gro Fairway	6.00 GH	6.23 BC	6.25 F
Par-Ex Fairway	6.25 EFG	6.15 C	6.40 EF
Ground Keeper	5.75 H	6.25 BC	6.35 EF
Evergro GTO W/ Meso	6.10 FGH	6.50 ABC	6.58 CDEF
Poly Plus Fairway Program	6.93 A	6.75 A	6.83 ABCDE
LSD_{05} =	0.39	0.45	0.48

*Values followed by the same letter are not significantly different at p=0.05.

Overall Turf Quality	July 15	July 22	July 29
Untreated	5.83 G	6.10 G	6.33 F
AGI Turf 1	6.58 BCDEF	6.93 ABC	7.40 ABC
AGI Turf 2	6.68 BCD	6.93 ABC	7.33 ABCD
AGI Turf 3	7.18 AB	7.08 AB	7.58 AB
AGI Turf 4	7.10 AB	7.15 A	7.58 AB
AGI Turf 7	7.43 A	7.08 AB	7.40 ABC
AGI Turf 8	7.25 AB	7.08 AB	7.60 AB
AGI Turf 9	6.93 AB	6.75 ABCDE	7.33 ABCD
AGI Turf 10	7.00 AB	6.93 ABC	7.50 ABC
Scott's Fairway Builder	6.78 ABC	6.75 ABCDE	7.33 ABCD
Scott's Super Fairway	6.83 AB	6.75 ABCDE	7.25 ABCD
Nu-Gro Fairway	5.90 FG	6.33 EFG	7.10 CDE
Par-Ex Fairway	6.85 AB	6.78 ABCD	7.33 ABCD
Ground Keeper	6.10 CDEFG	6.43 DEFG	6.90 DE
Evergro GTO W/ Meso	6.60 BCDE	6.53 CDEFG	7.15 BCDE
Poly Plus Fairway Program	6.85 AB	6.83 ABCD	7.68 A
LSD_{05} =	0.70	0.44	0.46

*Values followed by the same letter are not significantly different at p=0.05.

Overall Turf Quality	Aug 5	Aug 12	Aug 19
Untreated	6.68 E	6.25 D	6.18 G
AGI Turf 1	7.50 ABC	6.78 ABC	7.50 CDEF
AGI Turf 2	7.33 ABCD	6.78 ABC	7.83 ABCD
AGI Turf 3	7.40 ABCD	6.93 AB	8.15 A
AGI Turf 4	7.33 ABCD	6.85 AB	8.08 AB
AGI Turf 7	7.53 AB	7.00 A	7.60 BCDE
AGI Turf 8	7.33 ABCD	6.83 ABC	8.00 ABC
AGI Turf 9	7.33 ABCD	6.83 ABC	7.48 DEF
AGI Turf 10	7.60 A	6.78 ABC	7.40 DEF
Scott's Fairway Builder	7.33 ABCD	6.60 BC	7.50 CDEF
Scott's Super Fairway	7.25 ABCD	6.68 ABC	7.43 DEF
Nu-Gro Fairway	7.08 CDE	6.75 ABC	7.08 F
Par-Ex Fairway	7.40 ABCD	6.93 AB	7.83 ABCD
Ground Keeper	7.25 ABCD	6.93 AB	7.08 F
Evergro GTO W/ Meso	7.23 ABCD	6.50 CD	7.33 DEF
Poly Plus Fairway Program	7.50 ABC	6.93 AB	7.50 CDEF
LSD_{05} =	0.45	0.35	0.52

*Values followed by the same letter are not significantly different at p=0.05.

Overall Turf Quality	Aug 26	Sept 2	Sept 9
Untreated	5.58 F	6.08 G	6.60 D
AGI Turf 1	7.50 AB	7.08 ABCD	7.25 AB
AGI Turf 2	7.00 CD	7.08 ABCD	7.08 ABC
AGI Turf 3	7.50 AB	7.23 ABC	7.33 A
AGI Turf 4	7.58 A	7.25 AB	7.33 A
AGI Turf 7	7.33 ABC	7.08 ABCD	7.33 A
AGI Turf 8	7.50 AB	7.25 AB	7.23 AB
AGI Turf 9	7.08 CD	7.18 ABC	7.08 ABC
AGI Turf 10	7.08 CD	7.00 BCDE	7.08 ABC
Scott's Fairway Builder	7.15 BC	7.15 ABC	7.078 ABC
Scott's Super Fairway	7.10 BC	7.15 ABC	7.23 AB
Nu-Gro Fairway	6.50 E	6.75 EF	6.93 C
Par-Ex Fairway	7.15 BC	7.33 A	7.33 A
Ground Keeper	6.50 E	6.78 DEF	7.08 ABC
Evergro GTO W/ Meso	6.48 E	6.93 CDEF	6.93 C
Poly Plus Fairway Program	7.30 ABC	7.18 ABC	7.23 AB
LSD_{05} =	0.40	0.33	0.28

*Values followed by the same letter are not significantly different at p=0.05.

Overall Turf Quality	Frequency of Superior Ranking
Untreated	0
AGI Turf 1	13
AGI Turf 2	13
AGI Turf 3	15
AGI Turf 4	15
AGI Turf 7	14
AGI Turf 8	15
AGI Turf 9	12
AGI Turf 10	10
Scott's Fairway Builder	11
Scott's Super Fairway	8
Nu-Gro Fairway	1
Par-Ex Fairway	8
Ground Keeper	3
Evergro GTO W/ Meso	2
Poly Plus Fairway Program	14

The fertilizers that consistently were the best or equal to the best for clipping yield were AGI #1, AGI #4 and AGI #8 (Table 4). The fertilizers that produced the greatest amount of clippings over the 15 week period were in descending order, AGI #8, AGI #4, and AGI #1.

Table 4 – Kentucky bluegrass/fescue trial clipping yields, 2003.

Clippings Dry Wts. g/m^2	June 3	June 10	June 17
Untreated	9.23 DEF	6.65 HI	5.00 H
AGI Turf 1	15.73 ABC	18.90 A	12.68 A
AGI Turf 2	18.00 A	17.03 ABCD	9.25 ABCDEFG
AGI Turf 3	14.45 ABCDE	14.18 BCDEF	10.00 ABCDEF
AGI Turf 4	12.13 ABCDEF	18.38 ABC	12.48 AB
AGI Turf 7	16.80 ABC	15.60 ABCDE	11.63 ABCDE
AGI Turf 8	17.63 AB	18.75 AB	11.95 ABCD
AGI Turf 9	12.43 ABCDEF	13.13 DEFG	8.98 ABCDEFGH
AGI Turf 10	15.90 ABC	13.90 CDEFG	8.95 ABCDEFGH
Scott's Fairway Builder	15.83 ABC	13.23 DEFG	11.08 ABCDE
Scott's Super Fairway	11.90 ABCDEF	10.33 FGHI	8.08 DEFGH
Nu-Gro Fairway	7.85 F	9.48 GHI	6.75 FGH
Par-Ex Fairway	11.38 BCDEF	9.65 FGHI	7.78 EFGH
Ground Keeper	8.90 EF	6.53 I	5.75 GH
Evergro GTO W/ Meso	10.60 CDEF	11.30 EFG	8.35 CDEFGH
Poly Plus Fairway Program	7.25 F	12.00 EFG	12.25 ABC
LSD_{05} =	6.31	4.64	4.11

*Values followed by the same letter are not significantly different at p=0.05.

Clippings Dry Wts. g/m^2	June 24	July 2	July 8
Untreated	4.53 E	2.83 F	2.10 G
AGI Turf 1	12.23 A	9.03 ABC	7.40 AB
AGI Turf 2	9.80 ABCD	7.00 ABCDE	5.98 ABCD
AGI Turf 3	8.60 ABCDE	6.15 BCDE	5.23 BCDEF
AGI Turf 4	12.23 A	9.70 A	7.43 AB
AGI Turf 7	9.00 ABCD	7.08 ABCDE	5.90 ABCDE
AGI Turf 8	12.70 A	9.25 AB	7.23 ABC
AGI Turf 9	9.38 ABCD	6.73 ABCDE	4.85 CDEF
AGI Turf 10	9.95 ABCD	5.83 CDEF	5.78 ABCDE
Scott's Fairway Builder	9.23 ABCD	7.38 ABCDE	5.60 ABCDE
Scott's Super Fairway	7.30 CDE	5.63 DEF	3.53 EFG
Nu-Gro Fairway	6.93 CDE	4.88 EF	4.63 DEF
Par-Ex Fairway	7.28 CDE	5.23 DEF	4.50 DEF
Ground Keeper	6.10 DE	4.95 EF	3.05 FG
Evergro GTO W/ Meso	7.25 CDE	4.88 EF	3.78 DEFG
Poly Plus Fairway Program	10.60 ABC	9.43 AB	6.13 ABCD
LSD_{05} =	4.14	3.31	2.38

*Values followed by the same letter are not significantly different at p=0.05.

Clippings Dry Wts. g/m^2	July 15	July 22	July 29
Untreated	1.70 G	2.13 H	1.45 F
AGI Turf 1	13.778 ABC	10.53 ABCD	10.75 ABC
AGI Turf 2	11.25 BCD	9.43 ABCDE	8.55 ABCDE
AGI Turf 3	9.68 CDE	7.15 CDEFG	7.60 BCDE
AGI Turf 4	15.10 AB	11.78 AB	9.58 ABCDE
AGI Turf 7	11.58 BCD	8.93 ABCDE	7.73 BCDE
AGI Turf 8	16.65 A	12.38 A	13.70 A
AGI Turf 9	10.23 CDE	7.98 BCDEF	7.08 BCDE
AGI Turf 10	9.65 CDE	7.38 CDEF	7.30 BCDE
Scott's Fairway Builder	8.60 DE	7.20 CDEF	7.80 BCDE
Scott's Super Fairway	6.40 EF	4.90 FGH	5.18 DEF
Nu-Gro Fairway	5.88 EFG	5.55 EFGH	5.75 CDEF
Par-Ex Fairway	8.95 DE	7.35 CDEF	7.50 BCDE
Ground Keeper	4.05 FG	5.00 FGH	5.38 CDEF
Evergro GTO W/ Meso	7.95 DE	7.03 DEFG	6.63 CDEF
Poly Plus Fairway Program	9.70 CDE	9.15 ABCDE	8.18 ABCDE
LSD_{05} =	4.39	3.90	5.55

*Values followed by the same letter are not significantly different at p=0.05.

Clippings Dry Wts. g/m^2	Aug 5	Aug 12	Aug 19
Untreated	2.18 G	2.85 I	2.33 J
AGI Turf 1	8.13 ABCDE	5.50 ABCDEFG	12.55 ABCDE
AGI Turf 2	7.13 ABCDEF	5.75 ABCDEF	10.28 BCDEFG
AGI Turf 3	6.05 CDEF	4.50 EFGHI	8.95 DEFGHI
AGI Turf 4	8.45 ABCD	7.38 A	15.35 A
AGI Turf 7	6.25 CDEF	4.73 DEFGHI	10.45 BCDEFG
AGI Turf 8	10.38 A	7.05 ABC	14.23 AB
AGI Turf 9	6.13 CDEF	5.20 ABCDEFGH	11.20 ABCDEF
AGI Turf 10	6.03 CDEF	4.75 CDEFGHI	9.83 CDEFGH
Scott's Fairway Builder	6.30 CDEF	4.80 BCDEFGHI	8.43 EFGHI
Scott's Super Fairway	4.98 EFG	4.78 BCDEFGHI	8.43 EFGHI
Nu-Gro Fairway	4.75 EFG	3.78 FGHI	5.73 HIJ
Par-Ex Fairway	6.90 BCDEF	6.33 ABCDE	13.05 ABCD
Ground Keeper	5.43 DEFG	5.48 ABCDEFGHI	8.03 FGHI
Evergro GTO W/ Meso	5.58 CDEF	4.55 DEFGHI	6.45 GHIJ
Poly Plus Fairway Program	6.48 CDEF	4.80 BCDEFG	8.48 EFGHI
LSD_{05} =	3.52	2.31	4.23

*Values followed by the same letter are not significantly different at p=0.05.

Clippings Dry Wts. g/m^2	Aug 26	Sept 2	Sept 9
Untreated	1.85 K	2.30 H	1.38 G
AGI Turf 1	17.85 ABCD	18.98 A	14.10 AB
AGI Turf 2	12.88 BCDEFG	12.05 CDE	9.18 CDE
AGI Turf 3	12.18 EFGHI	10.78 DEF	8.40 CDEF
AGI Turf 4	19.15 A	18.08 AB	13.98 AB
AGI Turf 7	14.33 ABCDEF	12.33 BCD	8.88 CDEF
AGI Turf 8	18.18 ABC	19.60 A	17.18 A
AGI Turf 9	14.35 ABCDEF	12.60 CDEF	11.35 BC
AGI Turf 10	12.30 CDEFGH	11.35 DEF	10.08 BCD
Scott's Fairway Builder	10.63 EFGHI	11.88 CDEF	10.25 CD
Scott's Super Fairway	11.68 EFGHI	10.40 DEF	8.08 CDEF
Nu-Gro Fairway	4.28 JK	4.45 GH	4.40 FG
Par-Ex Fairway	16.35 ABCDE	18.35 A	14.40 AB
Ground keepers	6.48 HIJK	7.63 DEFGH	6.33 DEFG
Evergro GTO W/ Meso	6.30 IJK	6.25 FGH	5.40 EFG
Poly Plus Fairway Program	9.05 FGHIJK	8.70 DEFG	6.80 CDEF
LSD_{05} =	5.91	5.67	4.64

*Values followed by the same letter are not significantly different at p=0.05.

Clippings Dry Wts. g/m^2	Superior Clipping Yield	Total Clipping Yield
Untreated	0 out of 15 ratings	48.5 g
AGI Turf 1	15 out of 15 ratings	188.2 g
AGI Turf 2	10 out of 15 ratings	153.8 g
AGI Turf 3	3 out of 15 ratings	134.2 g
AGI Turf 4	15 out of 15 ratings	191.4 g
AGI Turf 7	8 out of 15 ratings	151.2 g
AGI Turf 8	15 out of 15 ratings	207.2 g
AGI Turf 9	7 out of 15 ratings	141.7 g
AGI Turf 10	4 out of 15 ratings	139.2 g
Scott's Fairway Builder	5 out of 15 ratings	138.2 g
Scott's Super Fairway	1 out of 15 ratings	111.6 g
Nu-Gro Fairway	0 out of 15 ratings	85.4 g
Par-Ex Fairway	5 out of 15 ratings	145.3 g
Ground Keeper	1 out of 15 ratings	89.2 g
Evergro GTO W/ Meso	0 out 15 ratings	102.6 g
Poly Plus Fairway Program	6 out of 15 ratings	129.2 g

Discussion

Nitrogen release has shown to be the greatest factor in producing a growth response. Nitrogen sources that efficiently are taken up by the plant will produce superior ratings on most occasions. Scott's Fairway and Super Fairway, which were considered industry standard products some years ago, were surpassed by many of the new generation fertilizers in this trial for nitrogen release and performance.

Although the products AGI Turf #1-4 all had an analysis of 12-2-10, their formulations were slightly different. It is common with experimental products to amend or change the individual components of the fertilizer in order to improve performance. These products are a good example how small formulation changes can improve a product's performance. The same was true of AGI #7 and #8, and AGI #9 and #10.

The AGI #4 and AGI #8 were the top two fertilizers in the trial and were superior on each rating date for all three rating criteria. AGI #1 was superior on each rating period except for quality when it was superior on 13 of 15 rating dates. AGI #3 was superior for colour and quality on each rating date, but clipping yield was quite low. AGI #2 and AGI #7 had superior ratings for colour and quality on almost every rating date, but clipping yields were somewhat lower than the top performers. AGI #9 and AGI #10 were very similar to each other in performance, and were comparable to the other fertilizers.

Of the Scott's products, the Fairway Builder was still quite good as it had superior colour and quality on the majority of the rating dates but clipping yields were superior on only 5 of 15 rating dates. The Super Fairway had superior ratings for colour and quality only half the time and clipping yields were low.

The Par-Ex Fairway product had superior colour and quality on half the rating dates, but clipping yields were superior only on the last five rating dates. These were the only occasions when they were superior, which would indicate that the fertilizer performs better after two applications. The Nu-Gro Fairway had low quality and colour and clipping yields were low. The Grounds Keeper product, which was organic in Nature, was also low in all three categories. The Evergro GTO w/Meso 24-4-20 ranked low for colour, quality and clipping yield.

The Poly Plus Fairway program had superior rankings for colour and quality on every rating date except one, however, the clipping yields were quite low in comparison to the other fertilizers.

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