

Evaluation of Kentucky Bluegrass and Fine Leaf Fescue Cultivars

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Summary

A regional turfgrass variety trial was established in May of 2004 to evaluate new grass cultivars under prairie growing conditions. Twenty-eight cultivars of Kentucky bluegrass and seven other grasses were selected from submissions received. Grasses were rated for three turf quality factors: colour, density and area cover. The trial was evaluated on a monthly basis from early May through to mid October. This is the final report for this trial.

In the first season of the trial *Fulca alkaligrass* showed very good establishment as it rapidly developed a dense turf. *Poa supina* was also quick to become established, but lost quality points due to its light green colour. The Kentucky bluegrass cultivars were slower to germinate but improved steadily over the course of the 2004 growing season and were generally better in quality than the fine leaf fescues.

The cultivars with the best overall colour ratings were: Total Eclipse, Rugby II, Nuglade, and Northstar, while Washington, Touchdown and Limousine had the poorest colour. The two cultivars that were the highest ranked overall were Odyssey and Chateau. For the fine leaf fescues, Victory chewing and was the best fescue for turf colour. For overall quality there were no significant differences.

For a comparison of the species, the Kentucky bluegrass had the highest colour and quality ratings.

Introduction

The National Turfgrass Evaluation Program evaluates turfgrasses at various sites throughout North America. However, being able to access regional turfgrass varietal data proves very valuable in identifying turf varieties that are better adapted to the prairie environment. This trial was established in 2004 to evaluate various Kentucky bluegrass in comparison to other grasses that might be used as turfgrass.

Materials and Methods

Twenty-eight cultivars of Kentucky bluegrass (*Poa pratensis*) along with seven other grasses were selected for entry into this trial from submissions received from local, national and international turf seed suppliers (Table 1).

The plot area was prepared at the Prairie Turfgrass Research Centre (Olds, Alberta) in the late summer of 2003. The existing sod was removed and a firm seed bed was prepared. Volunteer grass species were controlled with Roundup which was applied both in the fall of 2003 and again in the spring of 2004 prior to seeding.

Plots that measured 1 by 5 meters were arranged in a randomized complete block design (RCBD) and replicated four times. The trial was seeded by hand on May 26, 2004 using a small holed shaker bottle to uniformly distribute the seed over the plots. The Kentucky bluegrasses were seeded at a rate of 0.5kg/100m², while a rate of 1.6kg/100m² was used for the fescue species. The very small seeded alkali grass required only 0.2 kg/100m² to meet the recommended plant density of 2.3 plants/cm² (15 plants/inch²). After seeding, each plot was lightly raked to bury the seed and ensure good contact with the soil.

In year one the grasses were rated for their rate of establishment, while in year two and three, the grasses were rated for their colour and overall turf quality. The plots were mowed twice per week at a height of 1.8cm (¾ inch). The plots were fertilized at a rate of 0.5kg N/100m² (1 lb N/1000ft²) per growing month.

Table 1 – Grass species and varieties in the trial, Olds.

Grass Species	Cultivar
Kentucky bluegrass	Rambo
Kentucky bluegrass	Touchdown
Kentucky bluegrass	Award
Kentucky bluegrass	Rugby II
Kentucky bluegrass	Nuglade
Kentucky bluegrass	Alpine
Kentucky bluegrass	Odyssey
Kentucky bluegrass	Liberator
Kentucky bluegrass	Absolute
Kentucky bluegrass	Allure
Kentucky bluegrass	Chateau
Kentucky bluegrass	Brilliant
Kentucky bluegrass	Unique
Kentucky bluegrass	Blacksburg II
Kentucky bluegrass	North Star
Kentucky bluegrass	Avalanche
Kentucky bluegrass	Midnight
Kentucky bluegrass	Tsunami
Kentucky bluegrass	Limousine
Kentucky bluegrass	Impact
Kentucky bluegrass	Quantum Leap
Kentucky bluegrass	Washington
Kentucky bluegrass	Langara
Kentucky bluegrass	New Destiny
Kentucky bluegrass	Moon Shadow
Kentucky bluegrass	SR2884
Kentucky bluegrass	Total Eclipse
Kentucky bluegrass	P-105
Poa <u>supina</u>	Supranova
Sheep Fescue	Covar
Creeping Red Fescue	Boreal
Chewings Fescue	Treasure
Creeping Red Rescue	Badger
Chewings Fescue	Victory
<i>Puccinellia distans</i>	Fults Alkali Grass

The plots were evaluated on a monthly basis for three quality factors, colour density and area cover. These ratings were based on the National Turfgrass Evaluation Program (NTEP) protocols where numeric values are assigned to individual plots where 9 is best and 1 is poorest, and 6 is considered acceptable. Colour was evaluated by 1 is a brown dormant turf and 9 is a very uniform dark green colour. Turf density, a visual assessment of the number of shoots per unit area, was rated based on 1 is a thin, weak turf stand and 9 is a very dense tight-knit stand. The third factor rated was area cover and values ranged from a 1 for a complete absence of turf to a 9 for complete cover with the desired turf. The presence of weeds or voids in the turf reduced this rating. To compare the overall turf

quality, colour, density and area cover ratings were combined to give a single value. Individual rating date scores during spring, summer and fall were combined to produce a single overall quality value. Data was analyzed using the MSTAT analysis program.

Results and Discussion

Generally, this trial did not produce great differences between the species or the individual cultivars within the species. Some of the reasons for this may have been:

- fertility rates were low for the duration of the trial
- grasses chosen were very similar in their qualities
- nutrient imbalances which created less than ideal growing conditions

Establishment

The initial rating at 35 days after seeding revealed there was a significant difference in establishment of the grasses. Fults alkali grass (*Puccinellia distans*) and *Poa supina* established the best stand of turf and were scored the highest. The area cover ratings of the fescues, even though they scored lower, were not significantly different than the area ratings for the alkali grass or *Poa supina*. The Kentucky bluegrass cultivars, except for the cultivars Absolute and Washington, generally grew in more slowly and had significantly lower area cover ratings than either the alkali grass or *Poa supina* (Table 2).

By mid summer, it was suspected that *Poa annua* had become a well established grassy weed in the plots. An adjacent plot of *Poa annua* (Petersen's Creeping Bluegrass) had been established a number of years earlier and it was thought that seed which lay dormant in the soil or thatch of the previous turf was stimulated to germinate during the renovation of the site. Its light coloured foliage was very noticeable amongst the darker green colour of the Kentucky bluegrasses, while almost non detectable in the *Poa supina* and fescue plots.

By the 70th day after seeding, the grasses had almost completely established. Fults alkali grass and *Poa supina* had significantly higher area cover ratings than the Kentucky bluegrasses and the fine leaf fescues. However, the slower germinating Kentucky bluegrasses had improved dramatically from the previous rating period.

Table 2 - Establishment of the grasses, 2004.

Cultivar	Area Cover		Turf Colour	Turf Quality
	35 days after seeding	70 days after seeding	1 – 9 scale	Mean of 3 quality factors
Kentucky Bluegrass				
Rugby II	2.0d	5.0b	7.0a	5.7ab
Quantum Leap	2.3cd	4.8b	7.0a	5.6abc
Nuglade	2.0d	4.8b	7.0a	5.6abc
Tsumani	2.0d	4.8b	7.0a	5.6abc
Total Eclipse	2.3cd	4.8b	7.0a	5.6abc
New Destiny	2.3cd	5.0b	6.5abc	5.6abc
SR2284	2.3cd	5.0b	6.5abc	5.5abcd
Allure	2.3cd	4.8b	6.5abc	5.5abcd
Avalanche	2.5bd	4.8b	6.5abc	5.4abcde
Unique	2.5bd	4.8b	7.0a	5.4abcde
Moon Shadow	2.3cd	4.5bc	7.0a	5.4abcde
Odyssey	2.0d	4.5bc	7.0a	5.4abcde
Midnight	2.0d	4.8b	6.5abc	5.4abcde
Langara	2.3cd	5.0b	6.3abcd	5.4abcde
Limousine	2.3cd	4.8b	6.5abc	5.4abcde
Alpine	2.3cd	5.0b	6.3abcd	5.4abcde
Rambo	2.0d	4.5bc	6.5abc	5.3abcdef
P-105	2.3cd	4.5bc	6.8ab	5.3abcdef
Touchdown	2.0d	5.0b	6.0bcde	5.3abcdef
North star	2.3cd	4.5bc	6.5abc	5.2bcdef
Brilliant	2.3cd	4.8b	6.5abc	5.2bcdef
Absolute	3.0ab	4.8b	6.3abcd	5.2bcdef
Award	2.3cd	4.5bc	6.3abcd	5.1cdef
Liberator	2.3cd	4.5bc	6.0bcde	5.1cdef
Chateau	2.3cd	4.3bc	6.5abc	5.1cdef
Washington	2.8abc	4.8b	5.5de	5.0defg
Impact	2.5bcd	4.5bc	6.3abcd	5.0defg
Blacksburg II	2.0d	4.3bc	6.3abcd	5.0defg
Fine Leaf Fescue				
Treasure chewings	3.0ab	4.8b	5.8cde	5.1cdef
Badger creeping red	3.3a	4.5bc	5.8cde	5.0defg
Boreal creeping red	3.0ab	4.5bc	5.5de	4.9efg
Victory chewings	3.0ab	4.5bc	5.5de	4.8fg
Covar sheep	3.3a	4.0c	5.3e	4.5g
Other Grasses				
Fults Alkali Grass	3.3 a	6.0a	5.5de	5.8a
<i>Poa supina</i>	3.3 a	5.8a	5.3e	5.7ab
LSD _{0.05} =	0.6	0.7	0.8	0.5

*Within a column, values followed by the same letter are not significantly different at $p=0.05$.

Kentucky Bluegrass Ratings

Colour Ratings

Spring colour is a measure of colour during the transition period from winter dormancy to active spring growth. The highest rated cultivars were: Odyssey, Tsunami, Rugby II, Nuglade, and Impact, while the cultivar: Alpine scored the lowest for spring greenup

(Table 3). However, there were no significant differences between cultivars for spring colour.

Throughout the summer most of the Kentucky bluegrass cultivars were very similar in colour. The three top rated cultivars were: Total Eclipse, Quantum Leap and P-105 (Table 3). They were significantly better than Touchdown, Washington and Limousine.

The best cultivar for fall colour was North Star (Table 3). However, all cultivars were very similar in their rating and were not considered to be significantly different from each other.

The cultivars with the best overall colour ratings were: Total Eclipse, Rugby II, Nuglade, and Northstar (Table 3), while Washington, Touchdown and Limousine had the poorest colour.

Table 3 - Combined year comparison of colour for Kentucky bluegrass, 2005-2007.

Cultivar	Rating Period			Overall Colour
	Spring	Summer	Fall	
	————— 1-9 scale —————			
Total Eclipse	4.9a	6.8a	6.4a	6.2a
North Star	4.9a	6.7ab	6.7a	6.1ab
Rugby II	5.0a	6.7ab	6.5a	6.1ab
Nuglade	5.0a	6.7ab	6.2a	6.1ab
Odyssey	5.0a	6.7ab	6.2a	6.0ab
New Destiny	4.9a	6.7ab	6.4a	6.0ab
Quantum Leap	4.8a	6.8a	6.3a	6.0ab
Moon Shadow	4.8a	6.7ab	6.4a	6.0ab
Chateau	4.8a	6.5abc	6.6a	6.0ab
Absolute	4.8a	6.5abc	6.3a	6.0ab
Blacksburg II	4.7a	6.7ab	6.4a	6.0ab
P-105	4.7a	6.8a	6.3a	5.9ab
SR2884	4.9a	6.6abc	6.4a	5.9ab
Impact	5.0a	6.4abc	6.3a	5.9ab
Tsunami	5.0a	6.5abc	6.2a	5.9ab
Rambo	4.8a	6.6abc	6.3a	5.9ab
Avalanche	4.8a	6.3abc	6.5a	5.8ab
Liberator	4.9a	6.3abc	6.0a	5.8ab
Brilliant	4.8a	6.3abc	6.3a	5.8ab
Midnight	4.8a	6.3abc	6.3a	5.8ab
Allure	4.8a	6.3abc	6.2a	5.8ab
Langara	4.7a	6.5abc	6.3a	5.8ab
Award	4.8a	6.3abc	6.2a	5.7ab
Unique	4.7a	6.3abc	6.4a	5.7ab
Alpine	4.6a	6.3abc	6.3a	5.7ab
Limousine	4.8a	6.1bc	5.9a	5.6b
Washington	4.8a	6.0c	6.3a	5.6b
Touchdown	4.7a	6.2abc	6.3a	5.6b
LSD _{0.05} =	n/s	0.6	n/s	0.5

*Within a column, values followed by the same letter are not significantly different at p=0.05.

Turf Quality

The cultivars which ranked highest for spring turf quality were: Chateau, Rugby II and Avalanche (Table 4). Spring quality was an indication of overwintering capabilities of the individual cultivars. Those Kentucky bluegrass cultivars that rated highest for summer quality were: New Destiny, Blacksburg II and P-105 (Table 4). There was no statistical difference between the cultivars in the fall (Table 4).

The two cultivars that were the highest ranked overall were Odyssey and Chateau (Table 4). It should be noted that for overall quality none of the Kentucky bluegrasses received as high as an acceptable overall quality rating, which is a rating of 6. In past trials, this species is higher ranked, but for the duration of this test they ranked lower and with little separation between top and bottom varieties.

Table 4 – Combined year comparison of turf quality for Kentucky Bluegrass, 2005-2007.

Cultivar	Rating Period			Overall Quality
	Spring	Summer	Fall	
— Mean of 3 quality factors —				
Chateau	4.8a	6.5abc	6.4a	5.9a
Odyssey	4.7a	6.4abc	6.3a	5.9a
Rugby II	4.8a	6.6ab	6.4a	5.8a
Avalanche	4.8a	6.2abc	6.4a	5.8a
Nuglade	4.7a	6.5abc	6.1a	5.8a
North Star	4.7a	6.4abc	6.5a	5.8a
Total Eclipse	4.7a	6.4abc	6.4a	5.8a
Tsunami	4.7a	6.4abc	6.1a	5.8a
Allure	4.7a	6.3abc	6.3a	5.8a
Rambo	4.6a	6.5abc	6.3a	5.8a
Midnight	4.6a	6.3abc	6.2a	5.8a
Moon Shadow	4.5a	6.6ab	6.2a	5.8a
SR2884	4.5a	6.4abc	6.3a	5.8a
Quantum Leap	4.4a	6.6ab	6.4a	5.8a
Touchdown	4.7a	6.3abc	6.2a	5.7a
Liberator	4.7a	6.3abc	6.0a	5.7a
Impact	4.7a	6.2abc	6.3a	5.7a
New Destiny	4.6a	6.7a	6.3a	5.7a
Absolute	4.6a	6.4abc	6.3a	5.7a
Alpine	4.6a	6.3abc	6.2a	5.7a
Award	4.6a	6.2abc	6.2a	5.7a
P-105	4.5a	6.7a	6.2a	5.7a
Limousine	4.5a	6.1bc	6.1a	5.7a
Langara	4.3a	6.4abc	6.0a	5.7a
Washington	4.8a	6.0c	6.1a	5.5a
Brilliant	4.5a	6.3abc	6.1a	5.5a
Blacksburg II	4.3a	6.7a	6.3a	5.5a
Unique	4.3a	6.3abc	6.3a	5.5a
LSD _{0.05} =	n/s	0.5	n/s	n/s

*Within a column, values followed by the same letter are not significantly different at p=0.05.

Fine Leaf Fescue

Colour Ratings

An analysis of the turf colour data for the spring and summer rating periods showed no significant difference between the cultivars (Table 4). The fescue cultivars showed good colour retention under the cooler and frost-prone conditions of the fall. The creeping red fescue cultivar: Badger, scored the highest with Victory and Treazure chewings fescue close behind. Overall Victory chewings fescue was the best fescue for turf colour.

Table 5 - Combined year comparison of turf colour for fine leaf fescue, 2005-2007.

Cultivar	Rating Period			Overall Colour
	Spring	Summer	Fall	
	————— 1-9 scale —————			
Victory	4.8a	5.9a	5.8ab	5.6a
Treazure	4.8a	5.5a	5.8ab	5.3ab
Badger	4.7a	5.8a	5.9a	5.3ab
Boreal	4.7a	5.5a	5.5bc	5.2b
Covar	4.5a	5.8a	5.4c	5.2b
LSD _{0.05} =	n/s	n/s	0.3	0.3

^aWithin a column, values followed by the same letter are not significantly different at p=0.05.

Turf Quality

For spring quality the chewings fescue varieties Treazure and Victory were the best fescues although there were no significant differences (Table 6). During the summer, although there were differences, they were not significant. During the fall Badger, Victory and Treazure were significantly better than Covar and Boreal. For overall quality, there was no significant difference between fescues.

Table 6 - Combined year comparison of turf quality for fine leaf fescue, 2005-2007.

Cultivar	Rating Period			Overall Quality
	Spring	Summer	Fall	
	————— Mean of 3 quality factors —————			
Treazure	4.6a	5.5a	5.8ab	5.3a
Covar	4.3a	5.8a	5.4bc	5.3a
Victory	4.7a	5.8a	5.8ab	5.2a
Badger	4.4a	5.8a	5.9a	5.2a
Boreal	4.5a	5.4a	5.5b	5.1a
LSD _{0.05} =	n/s	n/s	0.3	n/s

^aWithin a column, values followed by the same letter are not significantly different at p=0.05.

Comparing the Grass Species

When it comes to evaluating turf solely based on colour and turf quality the general rule is that comparing cultivars within species is relative, while comparing the various species is not. This report will compare species but it should be made clear that each species will have its own specific qualities which were not taken into account in this trial.

Turfgrass Colour

An analysis of the turf colour data revealed no significant difference between species for spring colour (Table 7). The summer colour data indicates that there was a significant difference in turf colour between the species. The genetically darker green colour of the Kentucky bluegrass cultivars allowed it to consistently score higher. Under the fall conditions the Kentucky bluegrass and the fescues were the best. Overall, the Kentucky bluegrass showed the best colour but it was not significantly better.

Table 7 - Combined year comparison of various species for turf colour, 2005-2007.

Cultivar	Rating Period			Overall Colour
	Spring	Summer	Fall	
	1-9 scale			
Kentucky Bluegrasses	5.0a	6.5a	6.0a	6.0a
Fescues	5.0a	6.0ab	6.0a	5.0a
Fults Alkali Grass	5.0a	5.5bc	5.3b	5.0a
Poa supina	5.0a	5.0c	5.0b	5.0a
LSD _{0.05} =	n/s	0.5	0.4	n/s

^aWithin a column, values followed by the same letter are not significantly different at p=0.05.

Turf Quality

There was no significant difference between the species for either spring, summer or fall but overall Kentucky bluegrass was the best species when considering quality (Table 8).

Table 8 - Combined year comparison of various species for turf quality, 2005-2007.

Cultivar	Rating Period			Overall Quality
	Spring	Summer	Fall	
	Mean of 3 quality factors			
Kentucky Bluegrasses	5.0a	6.3a	6.0a	6.0a
Fults Alkali Grass	5.0a	6.0a	6.0a	5.3b
Poa supina	5.0a	6.0a	5.8a	5.0b
Fescues	4.5a	5.8a	5.8a	5.0b
LSD _{0.05} =	n/s	n/s	n/s	0.4

^aWithin a column, values followed by the same letter are not significantly different at p=0.05.

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