

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 the many submissions received from local, national and international turf seed suppliers. 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.

In the first season of the trial Fults 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 top Kentucky bluegrass cultivars for overall quality in year one were Rugby II, Quantum Leap, NuGlade, Tsunami, Total Eclipse, New Destiny, SR2284, Allure, Avalanche, Unique, Moon Shadow, Odyssey, Midnight, Langara, Limousine, and Alpine.

In the second season of the trial, the Kentucky bluegrass cultivars; Chateau, SR2884, Limousine, Rambo and Washington scored the highest for spring greenup. The Kentucky bluegrass cultivars: North Star and Quantum Leap were ranked the highest in overall turf quality. The Fults alkali grass produced results that were similar to that of the Kentucky bluegrasses. Despite its apple green turf colour, *Poa supina* had the highest overall quality ratings. The fescues consistently scored lower for density and area cover. The creeping red fescue cultivar, Boreal, was highest ranked fescue for overall turf quality.

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.

Materials and Methods

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

The plot area was prepared at the Prairie Turfgrass Research Centre 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 to ensure good contact with the soil.

For 2005, the trial shifted from the establishment phase to the established turf stage. An earlier experiment to test the cultivars at two different mowing heights was postponed. Instead the plots were regularly mowed at a height of 1.8cm (³/₄ inch). The plots were fertilized at a rate of 0.5kg N/100m² (1 lb N/1000ft²) per growing month.

Moisture was not a limiting factor in 2005, as the Olds area received 387mm of precipitation (20% over the seasonal average) over the growing season.

Table 1. Treatment List

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
<i>Poa supina</i>	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

Following National Turfgrass Evaluation Program (NTEP) protocols, three turf quality factors: colour, density and area cover were assessed on a monthly basis from early May through to mid October.

The colour factor subjectively evaluated the uniformity and intensity of the colour displayed by the turf. To assure that the turf colour was representative of the cultivar's genetic potential and not as a result of an environmental stress on the turf, only actively growing turf was rated. A 1 to 9 scale was used to rate the spring green-up and seasonal colour of each plot. Cultivars with a uniform dark green colour received scores ranging from 6 for an acceptable colour to 9 for turf with outstanding colour. Cultivars displaying weak or chlorotic turf colour were scored lower.

Density, the second quality factor, subjectively evaluated a cultivars' ability to produce shoots and tillers. The 1 to 9 scale was used to rate each plot. Cultivars which developed a thick tight knit turf surface received scores ranging from 6 for an acceptable density to 9 for a superior turf. Cultivars associated with a weak or thin turf stand were scored lower.

The final quality factor, area cover, subjectively evaluated the vigor of the turf. Again the 1 to 9 scale was used to rate each plot. Cultivars with a thick competitive turf cover received scores ranging from 6 for an acceptable area cover to 9 for superior area coverage. Cultivars affected by weed encroachment and/or the presence of bare patches were scored lower.

To compare the overall turf quality of the cultivars, the average of the combined colour, density and area cover scores for each plot was calculated and statistically analyzed.

Results and Discussion

It was not the intended purpose of this trial to make comparisons between the different turf species, but rather to provide a set of observations to assist the turf manager in the cultivar selection process. Every cultivar has attributes and weaknesses which the turf manager must consider when selecting the best combination of grasses for a specific application.

Kentucky Bluegrass Ratings

Spring Greenup

Two separate spring rating dates, May 5 and 18, measured the transition from winter dormancy to active spring growth or spring greenup (Table 2). An analysis of the turf colour data for the two rating dates revealed that the cultivars; Chateau, SR2884, Limousine, Rambo and Washington were scored the highest spring greenup, while the cultivars: Allure and Brilliant scored the lowest for initial spring turf colour. By the second rating date most of the cultivars displayed an acceptable spring colour.

Summer Colour

Throughout the summer most of the Kentucky bluegrass cultivars were very similar in colour ratings. However there was a statistical difference between the higher scoring cultivars: North Star and Moon Shadow and the lighter coloured Cultivars: Washington and Liberator (Table 2).

Fall Colour

The Kentucky bluegrass cultivars showed good colour retention under the cooler and frost-prone conditions of fall. Even though the cultivars: Chateau, North Star, Rugby II and Touchdown scored the highest for fall colour, there was no significant difference colour between the cultivars (Table 2).

Table 2 Kentucky bluegrass turf colour, Olds, 2005

Cultivar	Rating Period				Seasonal Average
	Early Spring	Spring	Summer	Fall	
	1-9 scale				
Chateau	5.0a	5.0a	6.3ab	6.3a	5.9
North Star	4.5a	5.0a	6.4a	6.3a	5.9
SR2884	5.0a	5.0a	6.3ab	6.0a	5.8
Odyssey	4.8a	5.3a	6.2abc	6.0a	5.8
Tsunami	4.8a	5.3a	6.0abc	6.0a	5.8
Unique	4.8a	5.0a	6.3ab	6.0a	5.8
Avalanche	4.8a	5.0a	6.3ab	6.0a	5.8
Langara	4.5a	5.0a	6.3ab	6.0a	5.8
New Destiny	4.5a	5.0a	6.3ab	6.0a	5.8
Rugby II	4.5a	5.0a	6.2abc	6.3a	5.8
Total Eclipse	4.3a	5.0a	6.3ab	6.0a	5.8
Limousine	5.0a	5.0a	6.0abc	6.0a	5.7
Rambo	5.0a	5.0a	6.0abc	6.0a	5.7
Midnight	4.8a	5.0a	6.1abc	6.0a	5.7
Award	4.8a	5.0a	6.1abc	6.0a	5.7
Moon Shadow	4.5a	5.0a	6.4a	5.8a	5.7
Nuglade	4.5a	5.0a	6.2ab	6.0a	5.7
Blacksburg II	4.5a	5.0a	6.2ab	6.0a	5.7
Absolute	4.5a	5.0a	6.1abc	6.0a	5.7
Impact	4.5a	5.0a	6.2abc	6.0a	5.7
P-105	4.5a	5.0a	6.2abc	6.0a	5.7
Quantum Leap	4.3a	5.0a	6.2abc	6.0a	5.7
Touchdown	4.3a	4.8a	6.3ab	6.3a	5.7
Allure	4.0a	5.3a	5.9abc	6.0a	5.7
Brilliant	4.0a	5.0a	6.2abc	6.0a	5.7
Washington	5.0a	5.3a	5.7c	5.8a	5.6
Liberator	4.5a	5.0a	5.8bc	5.8a	5.5
Alpine	4.5a	4.8a	5.9abc	5.8a	5.5
LSD _{0.10} =	n/s	n/s	0.5	n/s	

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

Turf Density

Shoot density can vary greatly over the course of the growing season. While the scores improved from the spring to the summer rating period, no significant difference in overall turf density between the cultivars was detected (Table 3).

Area Cover

With a general infestation of *Poa annua* throughout the site in the establishment year, the initial spring area cover rating was generally lower than expected. By the summer rating period, the many voids left by the troublesome weed were healed resulting in overall higher area cover assessments. An analysis of the area cover data revealed that the Kentucky bluegrasses were not significantly different from each other (Table 3).

Table 3 Kentucky bluegrass turf density and area cover (AC), Olds, 2005

Cultivar	Rating Period						Turf Quality Mean of the 3 Factors for the Season
	Spring		Summer		Fall		
	Density	AC	Density	A C	Density	AC	
	1-9 scale						
North Star	5.0a	4.8a	6.0a	6.0a	6.3a	6.0a	5.8
Quantum Leap	4.8a	5.0a	6.0a	6.0a	6.3a	6.0a	5.8
Chateau	5.0a	5.0a	6.0a	6.0a	6.3a	6.0a	5.7
Limousine	5.0a	5.0a	6.0a	6.0a	6.3a	6.0a	5.7
Nuglade	5.0a	5.0a	6.0a	6.0a	6.3a	6.0a	5.7
Avalanche	5.3a	5.0a	6.0a	6.0a	6.0a	6.0a	5.7
Touchdown	5.0a	5.0a	6.0a	6.0a	6.0a	6.3a	5.7
New Destiny	5.0a	5.0a	6.0a	6.0a	6.0a	6.0a	5.7
Odyssey	5.0a	5.0a	6.0a	6.0a	6.0a	6.0a	5.7
Total Eclipse	5.0a	5.0a	6.0a	5.8a	6.0a	6.0a	5.7
Moon Shadow	5.0a	5.0a	6.0a	6.0a	5.8a	6.0a	5.7
Tsunami	5.0a	5.0a	6.0a	5.8a	6.0a	6.0a	5.7
Rugby II	5.0a	5.0a	6.0a	6.0a	6.0a	5.8a	5.7
P-105	5.0a	4.8a	6.0a	6.0a	6.0a	6.0a	5.7
SR2884	4.8a	4.8a	6.0a	6.0a	6.3a	6.0a	5.7
Midnight	5.0a	5.3a	6.0a	5.5a	6.0a	6.0a	5.6
Allure	5.0a	4.8a	6.3a	5.8a	6.0a	6.0a	5.6
Rambo	5.0a	4.8a	6.0a	5.8a	5.8a	6.3a	5.6
Langara	5.0a	4.8a	6.0a	5.8a	6.0a	6.0a	5.6
Brilliant	4.8a	5.0a	6.0a	5.5a	6.0a	5.8a	5.6
Impact	4.8a	5.0a	5.8a	5.8a	6.0a	6.0a	5.6
Blacksburg II	4.8a	4.8a	6.0a	5.8a	6.3a	6.0a	5.6
Unique	5.0a	4.5a	6.0a	5.5a	6.0a	6.0a	5.6
Absolute	5.0a	4.3a	5.8a	6.0a	6.0a	6.0a	5.6
Award	5.0a	5.0a	5.8a	6.0a	5.8a	6.0a	5.5
Alpine	5.0a	5.0a	5.8a	5.8a	6.0a	6.0a	5.5
Liberator	4.8a	5.0a	5.8a	5.8a	6.0a	6.0a	5.4
Washington	4.8a	4.8a	5.8a	5.5a	5.8a	6.0a	5.4
LSD _{0.10} =	n/s	n/s	n/s	n/s	n/s	n/s	

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

Turf Quality

The scores awarded for the three quality factors over the course of the season were tabulated into a single quality value for each of the cultivars. The cultivars were ranked from highest to lowest based on overall seasonal quality (Table 3).

Fine Leaf Fescue Ratings

Spring Greenup

An analysis of the turf colour data for the early spring revealed a significant colour difference between the higher scoring cultivars: Treasure and Badger and the lowest scoring cultivar: Boreal. By the second rating date most of the cultivars displayed an acceptable spring colour (Table 4).

Summer Colour

Throughout the summer, the chewings fescue cultivar: Victory, scored the highest and was significantly better in colour when compared to the other fescues (Table 4).

Fall Colour

The fescue cultivars also showed good colour retention under the cooler and frost-prone conditions of the fall. The creeping red fescue cultivar: Badger, scored the highest and was significantly better for fall colour than the other fescues (Table 4).

Table 4 – Fine leaf fescue turf colour, Olds, 2005

Cultivar	Rating Period				Seasonal Average
	Early Spring	Spring	Summer	Fall	
	1-9 scale				
Badger	5.0a	5.0	5.3b	5.8a	5.4
Victory	4.8ab	5.0	5.8a	5.3b	5.4
Treasure	5.3a	5.0	5.3b	5.3b	5.2
Covar	4.8ab	5.0	5.0b	5.0b	5.0
Boreal	4.3b	5.0	5.0b	5.0b	5.0
LSD _{0.10} =	0.6	n/s	0.5	0.5	

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

Turf Density

For most of the spring and summer the stands of fescue were thin and not tight knit. The turf density data indicates that the fescue cultivars were only significantly different from each other in the spring, when the higher scoring cultivars, Boreal and Victory, had generated more tiller production than the cultivars, Treasure and Badger (Table 5).

Area Cover

In the early spring the fescue plots showed signs of winter damage. Numerous bare patches were present in the turf cover. The turf required most of the season to fill-in. By the fall evaluation, the area cover produced by most of the fescue cultivars was scored as acceptable (Table 5).

An analysis of the fall data revealed a significant lower rating for area cover between the chewings fescue cultivar, Treasure, and the other fescues (Table 5).

Table 5 Fescue turf density and area cover (AC), Olds, 2005

Cultivar	Rating Period						Turf Quality Mean of the 3 Factors for the Season
	Spring		Summer		Fall		
	Density	AC	Density	A C	Density	AC	
	1-9 scale						
Boreal	5.0a	4.8a	5.3a	5.0a	5.8a	6.0a	5.3
Victory	5.0a	4.5a	5.5a	5.3a	5.3a	6.0a	5.2
Badger	4.5ab	4.3a	5.5a	5.5a	5.3a	6.0a	5.2
Covar	3.8c	4.3a	5.5a	5.0a	6.0a	6.0a	5.1
Treasure	4.3bc	4.5a	5.3a	5.3a	5.3a	5.5b	5.0
LSD _{0.10} =	0.6	n/s	n/s	n/s	n/s	0.3	

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

Turf Quality

The scores awarded for the three quality factors over the course of the season were tabulated into a single quality value for each of the cultivars. The cultivars were ranked from highest to lowest based on overall seasonal quality (Table 5).

Comparing the Grass Species

When it comes to evaluating turf solely based on turf quality the general rule is that comparing ratings within species is relative, while comparing ratings between species is not. Hopefully, the strengths of each species will become more apparent after a head to head comparison is made for each of the three turf quality factors.

Spring Greenup

An analysis of the turf colour data for the two sampling dates revealed no significant difference in spring colour between the species (Table 6).

Summer Colour

The summer colour data indicates that there was a significant difference in turf colour between the species (Table 6). The genetically darker colour of the Kentucky bluegrass cultivars consistently scored higher for turf colour than the other grasses.

Fall Colour

All the turf species showed good colour retention under the fall conditions. Even though, the bluegrasses continued to score higher for colour there was no statistical difference in fall colour between the species (Table 6).

Table 6 - Comparison of species for turf colour, Olds, 2005.

Cultivar	Rating Period				Seasonal Average
	Early Spring	Spring	Summer	Fall	
	1-9 scale				
Kentucky Bluegrasses	4.8a	5.0a	6.0a	6.0a	5.7
Fescues	5.0a	5.0a	5.3b	5.0a	5.1
Poa supina	4.0a	5.3a	5.0b	5.0a	5.1
Fults Alkali Grass	4.5a	5.0a	5.0b	5.0a	5.0
LSD _{0.10} =	n/s	n/s	0.3	n/s	

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

Turf Density

Despite its tendency to be a slower starter in the spring, *Poa supina* produced the best turf density for both the summer and fall evaluations (Table 7).

While the Fults alkali grass and the Kentucky bluegrasses had similar turf densities throughout the growing season, the fescues lagged behind. The fescue plots tended to be not as dense as the other tighter knit turf surfaces (Table 7).

Area Cover

The spring and summer ratings found the area cover of the fescues to be significantly different than the other grass species in the trial (Table 7). Bare patches in the turf required most of the season to fill-in. By fall the fescue plots scored as high as the other grasses (Table 7).

Table 7 Comparison of species turf density and area cover (AC), Olds 2005

Cultivar	Rating Period						Turf Quality Mean of the 3 Factors for the Season
	Spring		Summer		Fall		
	Density	AC	Density	A C	Density	AC	
	-----1-9 scale-----						
Poa supina	4.8b	5.0a	7.0a	6.5a	6.5a	6.0a	5.7
Fults Alkali Grass	5.5a	5.3a	6.2ab	6.3a	6.3a	6.0a	5.6
Kentucky Bluegrasses	5.0ab	5.0a	6.0bc	6.0a	6.0a	6.0a	5.6
Fescues	4.5b	4.3b	5.5c	5.3b	5.3b	6.0a	5.2
LSD _{0.10} =	0.5	0.6	0.7	0.6	0.6	n/s	

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

Turf Quality

The scores awarded for the three quality factors over the course of the season were tabulated into a single quality value for each of the grass species. The species were ranked from highest to lowest based on overall seasonal quality (Table 7).

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