Evaluation of Kentucky Bluegrass Cultivars

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Introduction

Fifty-two Kentucky bluegrass cultivars were seeded in 2007 for display at the Turf Producers International Conference and Show which was held in Calgary in July of 2008. Many cultivars showed good establishment in year one of the trial. In order to provide a single score for overall quality and colour, data was combined for years two and three. When quality scores were ranked the cultivar Glenmont scored the highest. Nineteen other cultivars: Jacklin 94-1466, AKB 287, Hallmark, Harmonie, , ELT Blend, Jacklin 93-3429, Julia, Cheetah, Ulysses, Princeton 105, SR2284, Shamrock, A00-891, Bewitched, Delight, Shiraz, Nu Destiny, A98-1254 and A00-247 were ranked lower but were not significantly different than Glenmont in overall turf quality. For colour, the following individual varieties rated highest: Jacklin 94-1466, Harmonie, AKB 287, Cheetah, Mallard, Arrowhead, Glenmont, Hallmark, Nu Destiny, Langara and Thermal Blue Blaze. The cultivar Jacklin 93-3429 scored the highest for drought tolerance, although it was not considered statistically better than the other Kentucky bluegrass cultivars.

Materials and Methods

Forty-seven cultivars of Kentucky bluegrass (*Poa pratensis*) were received from Turfgrass Producers International for entry into this trial. In addition, five other grasses were seeded including the Eagle Lake Turf (ELT) Farm standard entry, which was used in their local sod fields.

The trial was established at Eagle Lake Turf Farms in Strathmore, Alberta in the summer of 2007. Plots, that measured 2 by 2 meters, were arranged in a randomized complete block design (RCBD) and replicated three times. The trial was seeded by drop spreader on July 5, 2007 to uniformly distribute the seed over the plots. The Kentucky bluegrasses were seeded at a rate of 0.5kg/100m^2 (1.2 lb/1000ft^2) and then following seeding, each plot was lightly raked to ensure good seed to soil contact. The plots were mowed twice per week at a height of 5.0cm (2”). The plots were fertilized twice over the season at a rate of 0.5kg N/100m^2 (1.2 lb N/1000ft^2).

In year one, the plots were rated for turf establishment on two occasions by determining area cover. Following establishment the plots were evaluated monthly 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 estimate 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 scores from each rating period were combined to give a single value. Data was analyzed using the MSTATC statistical analysis program.

In August of 2009 during a warm, dry period, the irrigation was turned off and after two weeks the grasses were evaluated for their drought tolerance. In order to determine drought tolerance, loss of colour and degree of wilt was assessed. Wilt is described as the first stage of drought stress injury where leaves have reduced water content and lose their turgor (the leave's ability to recover its original shape after traffic has been applied). In order to assess wilt, leaves were stepped on and degree of recovery of its original shape was subjectively assessed. Numeric values were then assigned to individual plots ranging from 1 to 9, where a 9 represents no loss of turf colour or turgor and a 1 represents a completely brown dormant turf with little or no turgor.

Results and Discussion

The results show that there were no significant differences in establishment for any of the three ratings dates (Table 1). However, when the data was combined there were a number of grasses that were significantly better than others. All those with a designation "a" are considered to be similar in their establishment and are better than those that are designated "b" or lower.

Table 1 – Turfgrass Establishment, Strathmore 2007.

Cultivar	Days After Seeding			Turf
	28 Days	60 Days	112 Days	Establishment
	Area Cover			
	——————1-9 scale ——————			Mean
A00-247	2.7a*	6.0a	7.3a	6.6a
Julia	3.3a	6.0a	7.0a	6.5a
Delight	2.7a	6.0a	7.0a	6.5a
Bluestone	2.3a	6.0a	6.7a	6.3ab
Excursion	2.3a	5.3a	7.0a	6.1abc
A98-948	2.3a	5.7a	6.7a	6.1abc
Shamrock	2.7a	6.0a	6.3a	6.1abc
A00-891	2.0a	5.7a	6.3a	6.1abc
Glenmont	3.3a	6.3a	6.0a	6.1abc
Shiraz	2.0a	5.3a	6.7a	6.0abc
Hallmark	2.7a	5.7a	6.3a	6.0abc
A98-1254	2.0a	5.3a	6.3a	5.8abcd
Rhythm	2.3a	5.7a	6.0a	5.8abcd
Bewitched	2.3a	5.3a	6.0a	5.8abcd
SR2284	3.0a	5.7a	5.8a	5.8abcd
Harmonie	2.3a	5.0a	6.3a	5.6abcde
Ulysses	2.7a	5.0a	6.0a	5.6abcde
AKB 287	2.0a	5.3a	6.0a	5.6abcde
A101-349	1.7a	5.3a	6.0a	5.6abcde
Diva	3.0a	5.3a	5.7a	5.6abcde
Cheetah	1.7a	5.3a	6.3a	5.5abcde
A98-999	2.7a	5.0a	6.0a	5.5abcde
Ultra 3-D	1.7a	5.3a	6.0a	5.5abcde
Jacklin 93-3429	2.0a	5.0a	6.0a	5.5abcde
Award	2.3a	5.0a	5.8a	5.5abcde

ELT Blend	2.7a	5.3a	5.7a	5.5abcde
Princeton 105	2.3a	5.3a	5.7a	5.5abcde
Y2K 136	2.3a	5.0a	5.3a	5.5abcde
Mallard	1.7a	4.7a	6.0a	5.3abcdef
Bluetastic	2.3a	5.0a	5.7a	5.3abcdef
Arrowhead	1.7a	5.0a	5.7a	5.3abcdef
Blue velvet	2.3a	5.0a	5.3a	5.3abcdef
Mystere	2.0a	5.0a	5.3a	5.3abcdef
Bandera	2.0a	5.0a	6.0a	5.1bcdef
Argos	1.3a	5.0a	5.7a	5.1bcdef
Blue Riffic	2.0a	5.0a	5.3a	5.1bcdef
Absolute	2.0a	5.0a	5.3a	5.1bcdef
Jacklin 94-1466	2.3a	4.7a	5.3a	5.0bcdef
Courtyard	1.7a	4.7a	5.1a	5.0bcdef
Langara	1.7a	4.7a	5.0a	5.0bcdef
Bedazzled	1.7a	4.3a	6.3a	4.8cdef
Spitfire	2.0a	4.3a	5.7a	4.8cdef
Blackberry	2.0a	4.7a	5.3a	4.8cdef
Moonshadow	1.7a	4.7a	5.3a	4.8cdef
Tsunami	1.0a	4.3a	5.3a	4.8cdef
Nu Destiny	1.7a	4.3a	5.3a	4.8cdef
Zinfandel	1.7a	4.7a	5.0a	4.8cdef
Blueridge	1.3a	4.7a	5.0a	4.8cdef
Thermal Blue Blaze	1.3a	3.7a	5.3a	4.5def
Blueberry	2.3a	4.3a	6.0a	4.3ef
Avalanche	1.3a	4.0a	5.3a	4.3ef
Argyle	1.3a	4.0a	5.3a	4.1f
$LSD_{0.05}$ =	n/s	n/s	n/s	1.3

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

In year two of this study, the grasses established quickly and most appeared as a mature stand by the time of the Turfgrass Producer's International Conference and Show in late July, 2008. Data shown in table 2 are a combined year analysis for 2008 and 2009. In addition, a single rating of drought tolerance is shown.

For colour, the following individual varieties rated highest: Jacklin 94-1466, Harmonie, AKB 287, Cheetah, Mallard, Arrowhead, Glenmont, Hallmark, Nu Destiny, Langara and Thermal Blue Blaze. Although the scores are quite similar from top to bottom, noticeable colour differences between varieties could be detected on many of the rating dates. Typically, those varieties with a rating score of 6.5 would appear as a lighter green colour than those that rated 7.3.

Insert picture #1.

The individual quality ratings for each of the rating dates were combined to produce an overall quality score for each of the cultivars. When the scores were ranked the cultivar Glenmont scored the highest. Nineteen other cultivars: Jacklin 94-1466, AKB 287, Hallmark, Harmonie, , ELT Blend, Jacklin 93-3429, Julia, Cheetah, Ulysses, Princeton

105, SR2284, Shamrock, A00-891, Bewitched, Delight, Shiraz, Nu Destiny, A98-1254 and A00-247 were ranked lower but were not significantly different than Glenmont in overall turf quality.

For drought tolerance, the cultivar Jacklin 93-3429 had the highest rating and many others showed good drought tolerance. Unfortunately, due to the fact that there was only one rating there was no statistical difference in drought tolerance between the grasses. Further evaluations will be necessary to provide a greater level of certainty that the grasses that rated highest are actually the best grasses for drought tolerance.

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Table 2 - Single drought stress and combined year ratings for turf colour and quality.

Cultivar	Overall Turf Colour	Overall Turf Quality	Drought tolerance Rating 2009
		1 – 9 scale	
Glenmont	7.1abc	7.3a	5.6a
Jacklin 94-1466	7.3a	7.2ab	6.6a
AKB 287	7.2ab	7.2ab	6.0a
Hallmark	7.1abc	7.2ab	6.0a
Harmonie	7.3a	7.2ab	5.6a
ELT Blend	7.1abc	7.2ab	5.0a
Jacklin 93-3429	6.8def	7.1abc	7.0a
Julia	7.0bcd	7.1abc	6.3a
Cheetah	7.2ab	7.1abc	6.0a
Ulysses	7.0bcd	7.1abc	5.6a
Princeton 105	6.9cde	7.1abc	5.6a
SR2284	6.9cde	7.1abc	5.6a
Shamrock	7.0bcd	7.1abc	5.3a
A00-891	6.8def	7.1abc	5.3a
Bewitched	6.7efg	7.1abc	5.3a
Delight	6.9cde	7.1abc	5.0a
Shiraz	6.5g	7.1abc	5.0a
Nu Destiny	7.1abc	7.1abc	4.6a
A98-1254	7.0bcd	7.1abc	3.6a
A00-247	6.5g	7.1abc	3.6a
Mallard	7.2ab	7.0bcd	6.3a
Spitfire	7.0bcd	7.0bcd	6.3a
Absolute	7.0bcd	7.0bcd	5.6a
Tsunami	7.0bcd	7.0bcd	5.6a
Argos	6.9cde	7.0bcd	5.6a
Arrowhead	7.1abc	7.0bcd	5.3a
Langara	7.1abc	7.0bcd	5.3a
Blueridge	7.0bcd	7.0bcd	5.3a
Bedazzled	7.0bcd	7.0bcd	5.3a
Ultra3-D	6.7efg	7.0bcd	5.3a
Bluestone	6.5g	7.0bcd	5.3a
Blue Riffic	7.0bcd	7.0bcd	5.0a

Moonshadow	7.0bcd	7.0bcd	5.0a
Mystere	6.8def	7.0bcd	5.0a
Blue Tastic	6.6fg	7.0bcd	5.0a
Rhythm	6.5g	7.0bcd	5.0a
Blackberry	7.0bcd	7.0bcd	4.6a
Blueberry	7.0bcd	7.0bcd	4.6a
Diva	7.0bcd	7.0bcd	4.6a
Y2K 136	6.7efg	7.0bcd	4.6a
A98-999	6.9cde	7.0bcd	4.3a
A98-948	6.8def	7.0bcd	3.6a
Thermal Blue Blaze	7.1abc	6.9cd	5.6a
Excursion	6.5g	6.9cd	5.3a
A101-349	6.6fg	6.9cd	5.0a
Zinfandel	6.9cde	6.9cd	4.6a
Award	6.5g	6.9cd	4.6a
Bandera	6.7efg	6.9cd	4.3a
Argyle	6.9cde	6.8d	6.0a
Blue Velvet	6.8def	6.8d	4.6a
Avalanche	6.7efg	6.8d	4.3a
Courtyard	7.0bcd	6.8d	3.6a
$LSD_{0.05}$ =	0.2	0.2	n/s

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

Discussion

Four grasses in this trial were also included in a Kentucky bluegrass trial that was located on Olds College campus that was completed in the year 2000. At that time, Award was rated third, Absolute was rated four, Shamrock was rated forty-four, and Princeton 105 was seventy-second. Award and Absolute were not in the top rated cultivars in this trial.

This trial will run for at least one more year. Further data should yield greater differences between the individual cultivars.

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