Evaluation of Various Grasses for Use on Putting Greens

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Summary

For overall turf quality, the best creeping bentgrass cultivars were T1, Penn A-4, Penneagle II. Ten of the eleven remaining bentgrasses scored slightly lower but were statistically equal in overall turf quality with the top three varieties. The creeping bentgrass cultivar CY2 did not perform as well as the top three cultivars. Both the velvet bentgrasses and the *Poa trivialis* failed to produce a high quality turf and scored lower in overall turf quality.

Introduction

Many new bentgrasses have been developed for use on cool season putting greens since the last test was completed in 2003 at Red Deer Golf and Country Club. The previous study showed that there was a significant improvement of some of the new creeping bentgrass cultivars over the previous industry standard cultivar, Penncross. At that time, Penn A-4 had the highest quality ratings, while Penn A-4, Penn A-1, Penn G-2, Penn G-6, Imperial and Southshore had higher quality ratings than the industry standard, Penncross.

Velvet bentgrass has never been tested in the cold climate of Alberta. It is generally thought that this species requires less input of fertilizer and water and may have an application in a number of situations. In addition, *Poa trivialis* (rough-stalk bluegrass) was included in this trial. It will withstand close mowing and is very cold tolerant.

Materials and Methods

Fourteen cultivars of creeping bentgrass, two cultivars of velvet creeping bentgrass and two cultivars of *Poa trivialis* were seeded on a bentgrass nursery at the Salmon Arm Golf and Country Club on June 21, 2007. The bentgrass cultivar Penncross was designated as the standard entry for the trial (Table 1).

Plots were replicated four times in a Randomized Complete Block Design (RCBD). The plots measured 1.5m by 2m and the rootzone was a sand/peat mixture. Seed was evenly distributed over the individual plots with small shaker bottles at the rates listed below. Following germination plots were mowed for the first time at a height of 0.50" 43 days after seeding. The first fertilizer application was applied 33 days after seeding and then weekly beginning 50 days after seeding. Fertility applications rates were approximately 0.75kg N/100m^2 (1.5lb N/1000ft^2) per growing month. Plots were irrigated to maintain a moist rootzone during the establishment period.

Table 1 – List of grasses for putting green study, Salmon Arm.

Creeping Bentgrass	Seeding rate
Alpha	0.5kg/100m^2
Cobra 2	0.5kg/100m^2
CY2	0.5kg/100m^2
Declaration	0.5kg/100m^2
Independence	0.5kg/100m^2
Kingpin	0.5kg/100m^2
L-93	0.5kg/100m^2
Memorial	0.5kg/100m^2
Penn G-1	0.5kg/100m^2
Penn A-4	0.5kg/100m^2
Penncross	0.5kg/100m^2
Penneagle II	0.5kg/100m^2
Pennlinks II	0.5kg/100m^2
T1	0.5kg/100m^2
Velvet Bentgrass	
Legendary	0.5kg/100m^2
Vesper	0.5kg/100m^2
Poa trivialis	
Dark Horse	0.75kg/100m^2
Sabre	0.75kg/100m^2

Initially the plots were evaluated for area cover to determine the rate of establishment. Following that, plots were rated for three turfgrass quality factors: colour, density, and area cover. These individual factors were also combined to give a single overall quality rating. These ratings were based on the National Turfgrass Evaluation Program (NTEP) protocols when 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. Rating for turf density, a visual estimate of number of shoots, was 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.

Results

Establishment Data

Weather conditions for germination were hot and dry for the first six weeks and establishment was slow. As far as species were concerned established was better for the creeping bentgrass than either the rough bluegrass or the velvet bentgrass. At the 60 day rating period, rough bluegrass had better establishment than did the velvet bentgrass. The bentgrass cultivars that established the best were Alpha, Pennlinks II, L-93, and Penneagle II (Table 2).

Trial at Salmon Arm showing plots in establishment year

Table 2 - Establishment data for putting green grasses study, Salmon Arm, 2007.

	Days After Seeding				
Cultivar	30 Days	60 Days	90 Days	120 Days	Overall
	Area Cover 1-9 scale				
Alpha	4.8a	7.3ab	8.5a	8.5a	6.0a
Pennlinks II	2.8bcde	8.0a	8.5a	8.5a	5.7ab
L-93	3.8abc	7.5ab	8.3ab	8.3ab	5.7ab
Penneagle II	3.5abcd	7.5ab	8.3ab	8.3ab	5.7ab
Kingpin	4.0ab	7.3ab	7.5bc	7.3cd	5.4bc
Penncross	2.0ef	6.8abc	8.3ab	8.3ab	5.2cd
Memorial	2.8bcde	7.0abc	7.8abc	7.8abc	5.2cd
Penn G-1	2.5cde	7.3ab	7.5bc	7.5bc	5.1cd
CY2	2.3def	7.3ab	7.5bc	7.5bc	5.1cd
Declaration	3.0bcde	7.0abc	7.3c	7.3cd	5.1cd
T1	2.8bcde	7.3ab	7.3c	7.0cd	5.0cd
Cobra 2	3.0bcde	6.8abc	7.3c	7.3cd	5.0cd
Penn A-4	2.0ef	6.3bc	7.3c	7.8abc	4.8de
Independence	2.0ef	5.5c	7.0cd	7.3cd	4.5ef
Sabre	2.0ef	5.5c	6.3de	6.5de	4.2f
Dark Horse	2.0ef	5.5c	6.0e	6.0e	4.1f
Vesper	1.0f	3.5d	5.0f	4.5f	3.0g
Legendary	1.0f	3.0d	5.0f	4.8f	2.9g
$LSD_{0.05}$ =	1.4	1.6	0.9	0.8	0.4

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

Turfgrass Quality Ratings

Quality ratings are not reported for 2008, as the overall quality of the trial was low and there were no statistical differences between the various grasses. For overall turf quality in 2009, the best creeping bentgrass cultivars were T1, Penn A-4, Penneagle II. Ten of the eleven remaining bentgrasses scored slightly lower but were statistically equal in overall turf quality to the top three varieties. The creeping bentgrass cultivar CY2 did not perform as well as the top three cultivars (Table 3). The velvet bentgrass and the *Poa trivialis* failed to produce a high quality turf and were scored lower in overall turf quality.

Table 3 - Overall turf quality, Salmon Arm 2009.

Cultivar	Spring	Early Summer	Summer	Late Summer	Combined Rating
	1-9 scale				Mean
T1	4.5ab	6.2ab	7.2a	8.0a	6.5a
Penn A-4	4.7a	6.5a	7.0a	7.7ab	6.5a
Penneagle II	4.7a	6.7a	6.7ab	7.7ab	6.5a
Declaration	4.2ab	6.2ab	6.5ab	7.2b	6.2ab
Independence	4.5ab	6.0ab	6.5ab	7.5ab	6.2ab
Memorial	4.2ab	6.0ab	6.7ab	7.7ab	6.0ab
Kingpin	4.2ab	6.0ab	6.5ab	7.7ab	6.0ab
Penn G-1	4.2ab	5.7bc	6.7ab	7.5ab	6.0ab
Pennlinks II	4.2ab	5.7bc	6.7ab	7.5ab	6.0ab
L-93	4.0abc	5.7bc	6.7ab	7.5ab	6.0ab
Cobra 2	3.7bc	5.7bc	6.7ab	7.2b	6.0ab
Alpha	4.2ab	5.5bc	6.7ab	7.0b	6.0ab
Penncross	4.0abc	5.2cd	6.5ab	7.2b	6.0ab
CY2	4.0abc	5.5bc	6.2bc	7.2b	5.7bc
Legendary	3.2cd	5.5bc	5.5c	6.2c	5.2cd
Vesper	3.2cd	4.7d	5.5c	6.0c	5.0d
Sabre	2.5de	2.7e	3.5d	3.5d	3.0e
Dark Horse	2.2e	3.2e	3.5d	3.0d	3.0e
$LSD_{0.05}$ =	0.8	0.7	0.7	0.7	0.5

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

Discussion

This trial may not have been a good evaluation of the grasses that were included. First of all, due to hot and dry conditions, establishment was slow. This particularly affected the Velvet bentgrass, which appear to be slower to establish than creeping bentgrass. There also appeared to be some encroachment between plots and it was difficult to determine whether the grasses that were in the plots were the originally seeded grasses. And finally, for the *Poa trivialis* the mowing height may have been too low for this species to proliferate. A new trial will be initiated in 2010.