

Evaluation of Various Grasses for Use on Putting Greens

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Summary

Two tests were established in 2007 to evaluate various grasses for use on putting greens. The test undertaken at Salmon Arm established at a slower rate than did the Calgary trial, no doubt as a result of weather conditions. Generally, the creeping bentgrasses established more quickly than did the velvet bentgrasses. At Salmon Arm, the bentgrass cultivars that established the best at the 90 day rating period were Penneagle II, Alpha, L-93, Pennlinks II, Penncross and Memorial. The cultivars with the best overall quality were Penneagle II, Alpha, L-93, Pennlinks II, Penncross, Penn A-4, Declaration, Cobra 2, T1, and Penn G-1. The best creeping bentgrass cultivars for overall quality at Calgary were Cobra 2, Alpha, Declaration, Independence, L-93, Pennlinks II, CY2, Penn A-1, Penncross and T1. This trial will continue for three more years.

Introduction

Many new bentgrasses have been developed for use on cool season putting greens since the last test that 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, A-1, G-2, G-6, Imperial and Southshore had higher quality ratings than the industry standard, Penncross, on each of 17 rating dates.

Velvet bentgrasses have never been tested in the cold climate of Alberta. It is generally thought that these grasses require less input of fertilizer and water and may be a species of grass that may have an application in a number of situations.

Two tests were initiated in 2007, one in Salmon Arm, British Columbia and one in Calgary, Alberta, in order to determine their suitability for use in these two environments. It is expected that data from this trial will be collected for another three years.

Materials and Methods

Fourteen cultivars of creeping bentgrass, two cultivars of velvet creeping bentgrass and two cultivars of *Poa trivialis* (rough stalk bluegrass) were seeded on a bentgrass nursery at the Salmon Arm Golf and Country Club on June 21. In Calgary, 12 creeping bentgrasses and two velvet bentgrassess were seeded on a nursery site at The Canal at Delacour Golf Club on August 7. 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 at both sites. At the Salmon Arm site, plots were initially mowed 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/100m² (1.5lb N/1000ft²) per growing month. At Calgary, mowing commenced 23 days after seeding and the first application of fertilizer was 15 days after seeding. In both tests, plots were irrigated to maintain a moist rootzone during the establishment period. A preventative snow mould fungicide was applied in the fall.

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

Bentgrasses	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 Bentgrasses	
Legendary	0.5kg/100m ²
Vesper	0.5kg/100m ²
Poa trivialis	
Dark Horse	0.75kg/100m ²
Sabre	0.75kg/100m ²

Table 2 – List of putting green grasses in study, Calgary.

Bentgrasses	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
L-93	0.5kg/100m ²
Penn A-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 Bentgrasses	
Legendary	0.5kg/100m ²

Initially the plots were evaluated for area cover on a monthly basis to determine the rate of establishment. In addition, plots were rated at the end of the season 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. Turf density, a visual estimate of number of shoots, 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.

Results

Weather conditions for germination and establishment were quite different at each site. At Salmon Arm, conditions were hot and dry for the first six weeks after seeding, whereas, Calgary was cool and wet for the initial stages of establishment.

At Salmon Arm, as far as species were concerned the creeping bentgrass established more quickly than did the rough bluegrass which established more quickly than the velvet bentgrass. The bentgrass cultivars that established the best at the 90 day rating period were Penneagle II, Alpha, L-93, Pennlinks II, Penncross and Memorial (Table 3).

As far as the year end quality rating was concerned the creeping bentgrasses had better quality than the velvet bentgrasses which were better than the rough bluegrasses. The cultivars with the best overall quality were Penneagle II, Alpha, L-93, Pennlinks II, Penncross, Penn A-4, Declaration, Cobra 2, T1, and Penn G-1.

Table 3 - Establishment data for putting green grasses study Salmon Arm, 2007.

Cultivar	Days After Seeding				Final Seasonal Turf Quality Rating			
	17 Days	30 Days	60 Days	90 Days	October 18 th			Overall Quality Mean
	Area Cover ————— 1-9 scale —————				Area Cover	Colour	Density	
Penneagle II	1.0a	3.5abcd	7.5ab	8.3ab	8.3ab	5.0ab	4.0c	6.0a
Alpha	1.0a	4.8a	7.3ab	8.5a	8.5a	4.5b	4.3b	5.8ab
L-93	1.0a	3.8abc	7.5ab	8.3ab	8.3ab	5.0ab	4.0c	5.8ab
Pennlinks II	1.0a	2.8bcde	8.0a	8.5a	8.5a	4.8ab	4.0c	5.8ab
Penncross	1.0a	2.0ef	6.8abc	8.3ab	8.3ab	4.8ab	4.0c	5.8ab
Penn A-4	1.0a	2.0ef	6.3bc	7.3c	7.8abc	5.5a	4.0c	5.8ab
Declaration	1.0a	3.0bcde	7.0abc	7.3c	7.3cd	5.5a	4.0c	5.5ab
Cobra 2	1.0a	3.0bcde	6.8abc	7.3c	7.3cd	5.3a	4.0c	5.5ab
T1	1.0a	2.8bcde	7.3ab	7.3c	7.0cd	5.5a	4.0c	5.5ab
Penn G-1	1.0a	2.5cde	7.3ab	7.5bc	7.5bc	4.8ab	4.0c	5.5ab

Kingpin	1.0a	4.0ab	7.3ab	7.5bc	7.3cd	4.3b	4.0c	5.3bc
Memorial	1.0a	2.8bcde	7.0abc	7.8abc	7.8abc	4.5b	4.0c	5.3bc
CY2	1.0a	2.3def	7.3ab	7.5bc	7.5bc	4.5b	4.0c	5.3bc
Independence	1.0a	2.0ef	5.5c	7.0cd	7.3cd	4.3b	4.0c	5.3bc
Vesper	1.0a	1.0f	3.5d	5.0f	4.5f	3.3c	6.0a	4.8cd
Legendary	1.0a	1.0f	3.0d	5.0f	4.8f	3.0c	6.0a	4.8cd
Sabre	1.0a	2.0ef	5.5c	6.3de	6.5de	3.0c	3.8c	4.5de
Dark Horse	1.0a	2.0ef	5.5c	6.0e	6.0e	3.0c	3.8c	4.0e
LSD _{0.05} =	n/s	1.4	1.6	0.9	0.8	0.7	0.2	0.6

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

At Calgary, the area cover ratings were all similar 29 days after seeding. Establishment was much more rapid in Calgary than in Salmon Arm, no doubt due to the more favourable weather conditions. Most of the creeping bentgrasses were better than the velvet bentgrasses but the ratings were much more similar than at Salmon Arm. The best creeping bentgrass cultivars for overall quality were Cobra 2, Alpha, Declaration, Independence, L-93, Pennlinks II, CY2, Penn A-1, Penncross and T1 (Table 4).

Table 4 - Establishment data for putting green grasses study, Calgary, 2007.

Cultivar	27 Days After Seeding	Final Seasonal Turf Quality Rating			
	September 5 th	October 10 th			Overall Quality Mean
	Area Cover 1-9 scale	AC	Colour 1-9 scale	Density	
Cobra 2	5.3a	6.3a	6.3a	5.7a	6.3a
Alpha	5.3a	6.0a	6.3a	5.3a	6.0ab
Declaration	5.3a	6.3a	6.0a	5.3a	6.0ab
Independence	5.0a	6.3a	6.0a	5.7a	6.0ab
L-93	6.0a	6.7a	6.0a	5.3a	6.0ab
Pennlinks II	5.3a	6.3a	6.0a	5.3a	6.0ab
CY2	5.0a	6.3a	6.3a	5.0a	5.7abc
Penn A-1	5.7a	6.0a	6.0a	4.3a	5.7abc
Penncross	5.0a	6.0a	5.7a	4.7a	5.7abc
T1	5.0a	6.0a	6.3a	5.3a	5.7abc
Penn A-4	5.3a	6.0a	5.7a	4.7a	5.3bc
Penneagle II	5.0a	5.7a	5.7a	4.3a	5.3bc
Legendary	5.7a	5.3a	5.0b	4.7a	5.0c
Vesper	5.0a	5.3a	5.0b	4.7a	5.0c
LSD _{0.05} =	0.2	n/s	0.6	n/s	0.7

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