Saline Tolerant Grass Trial

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Summary

A saline tolerant grass trial was established late in the summer of 1999 at the Olds Central Highlands Golf Club. The EC (Electroconductivity) readings of the soil were 7 mS/cm. At this level only salt tolerant species would survive. All the grasses tested demonstrated some salt tolerance. The Creeping Red Fescues, Hard Fescue and Reflexed Saltgrass were the top performers throughout the summer of 2000 while Idaho Bentgrass, RS Hydrid Wheatgrass, and Idaho Fescue ranked low overall

Introduction

Grass species and cultivars exist that are tolerant to moderate salinity and are capable of producing and maintaining satisfactory vegetative growth. However, with the continued use of irrigation and development on marginal land, golf course managers are encountering an ever-increasing problem with salinity throughout the prairies. For this reason salt tolerant species must be coupled with a sound understanding and utilization of management techniques to maintain a healthy turfgrass canopy.

Salt tolerance is considered a critical aspect in the establishment of a high quality turfgrass stand in saline conditions. However, characterizations of several cool season turfgrass species available within the industry have shown sensitivity in the presence of salts.

Varietal trials focusing on saline tolerance are important to ensure the necessary groundcover on fairways and roughs where salt concentrations pose a problem. This trial was established to evaluate grass species or cultivars for their ability to establish and grow in areas prone to high salt levels.

Materials and Methods

Twelve cultivars of saline tolerant grasses were seeded on August 29, 1999. The plots were laid out in a Randomized Complete Block Design (RCBD) and replicated four times. The plots measure 1.5 x 2 m. An industry standard salt tolerant grass, Dawson Creeping Red Fescue, will act as the control for this trial. The outside perimeter of the plots was seeded with Reflexed Saltgrass cv Fults. The plot area will be maintained the same as the surrounding turf.

Soil tests to determine electroconductivity (EC) values were taken in the fall of 1999 and 2000. The results of 7 mS/cm and 6.5 mS/cm respectively categorized the soil as only being able to sustain salt tolerant plant material.

Evaluations of colour, density and area cover were conducted on a monthly basis from April to October. These ratings will be based upon the National Turfgrass Evaluation Program (NTEP) rating scale. In this rating system, 1 is poorest, 9 is exceptional and 5 is considered acceptable quality. The overall rating is a composite of all ratings taken over the year and represents the performance of each grass throughout the growing season. Species and cultivars selected for the trial are listed in Table 1.

Table 1. Grasses used in the 1999/2000 Salt Trial.

Species	**Cultivar**
Alkali Grass	R9-208 (Nuttal's)
Reflexed Saltgrass	Fults
Kentucky Bluegrass	Absolute
Idaho Bentgrass	Golfstar
RS Hybrid Wheatgrass	Newhy
Crested Wheatgrass	Kirk
Hard Fescue	Warwick
Idaho Fescue	N/A
Creeping Red Fescue	Boreal
Creeping Red Fescue	Aruba
Creeping Red Fescue	Dawson
Creeping Red Fescue	Seabreeze

Results and Discussion

Creeping Red Fescue cv. Dawson demonstrated the best overall performance in the "Grow-In"(first year) phase of the trial. Dawson was ranked consistently high throughout all ratings during 2000 (Table 2.0).

Very few of the species and/or cultivars demonstrated ratings throughout the year that were acceptable (above 5) and no species produced an overall acceptable rating. The plots were established with little supplemental irrigation. This may have resulted in drought stress and salt levels within the rootzone which were exceptionally high due to the inability to leach salts out of the rootzone. This affected the performance of the species during germination and juvenile growth stages.

Table 2.0. Area cover and color ratings during the establishment year (2000) of the salinity grass trial at Olds Highlands Golf Club.

Species	**Cultivar**	**Rank**	**Spring**	**Summer**	**Fall**		**Overall**
		Rank	**Area Cover**	**Area Cover**	**Color**	**Area Cover**	**Overall Rating**
Creeping Red Fescue	Dawson	1	2.25	5.25	3.25	4.75	3.88
Hard Fescue	Warwick	2	2.75	4.50	2.75	4.50	3.63
Creeping Red Fescue	Boreal	3	2.25	4.00	3.00	4.75	3.50
Creeping Red Fescue	Seabreeze	4	2.50	4.50	2.00	3.50	3.13
Reflexed Saltgrass	Fults	5	3.25	2.50	1.75	4.75	3.06
Creeping Red Fescue	Aruba	6	1.75	4.25	2.75	3.25	3.00
Crested Wheatgrass	Kirk	7	2.75	2.50	3.25	3.25	2.94
Alkali Grass	R9-208 (Nuttal's)	8	2.00	2.25	1.25	5.00	2.63
Kentucky Bluegrass	Absolute	9	1.50	4.25	2.25	2.50	2.63
Idaho Fescue	N/A	10	1.00	3.75	1.75	2.75	2.31
RS Hybrid Wheatgrass	Newhy	11	1.50	3.00	1.50	3.00	2.25
Idaho Bentgrass	Golfstar	12	1.00	3.25	2.00	2.50	2.19
LSD (0.05)			0.79	1.12	1.35	1.50	0.74

The Creeping Red Fescues, Hard Fescue and Reflexed Saltgrass were the top performers in the first year of the trial. Idaho Bentgrass, RS Hydrid Wheatgrass, and Idaho Fescue ranked low overall. Crested Wheatgrass cv. Kirk ranked 7th overall, suggesting there are grasses that are better suited for highly saline areas during establishment.

The summer of 2000 was dry which influenced the establishment of all the grasses within the trial. In all instances crystallization of salt was evident on the soil surfaces which may have affected turfgrass growth. In these situations careful management of the irrigation regime would have greatly improved turfgrass growth.

Conclusions

During the establishment year very few of the species and/or cultivars demonstrated ratings that were acceptable (above 5) and no species produced an overall acceptable rating. The Creeping Red Fescues, Hard Fescue and Reflexed Saltgrass were the top performers in the first year of the trial. Idaho Bentgrass, RS Hydrid Wheatgrass, and Idaho Fescue ranked low overall.

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