Saskatchewan Forage Council
Variety Performance in Saskatchewan (1992 - 1996)

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This paper summarizes the forage yield and quality data collected at fifteen (15) sites across Saskatchewan between 1992 and 1996. The yield data is expressed as a percentage of the check variety. In addition, forage species were compared in terms of total forage yield.

In this study, a first cut was taken when the alfalfa plants at each site were at 5% bloom. At this stage, most earlier forage species like crested wheatgrass were headed out and often blooming while later maturing species like smooth brome or intermediate wheatgrass were in the early to late boot stage of development. Stage of plant maturity is the single most important factor that determines the quality of forage. In general, as yield increases, neutral detergent fibre (NDF) and acid detergent fibre (ADF) increase. As NDF and ADF increase, intake and digestibility decrease respectively. In addition, forage species differ in morphology and growth characteristics, which often determine whether the species would make a better pasture or forage hay. These factors should be considered when interpreting the data.

Table 1 Relative Yield of Alfalfa Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Regrowth	Brown	Dark Brown	Black/Gray	Irrigation	Average
Heinrichs	Slow	87	99	101	98	98
Rambler	Slow	88	94	100	89	96
Rangelander	Slow	95	93	104	93	99
Apica	Rapid	106	101	99	100	101
OAC Minto	Medium	96	99	103	99	100
Algonquin	Medium	98	95	101	97	100
Anchor	Rapid	93	101	97	104	98
Alouette	Rapid	96	103	99	-	99
Barrier	Rapid	88	98	98	107	96
Vernal	Medium	96	90	98	100	95
Profit	Rapid	96	104	90	-	96
Beaver	Medium	100	100	100	100	100
Check (Kg/Ha)		4120	7000	6280	11000	6130

Table 1 shows the performance of recommended varieties of alfalfa in Saskatchewan. There were many other entries in the trials. Alfalfa yields were the highest in the dark brown soil zone and lowest in the brown soil zone. Variety ranking varied among soil zones. Overall means ranged from 96% (Rambler) to 101% (Apica) of Beaver. The rapid regrowth varieties often out-yielded Beaver under irrigation.

Table 2 Relative Yield of Smooth Bromegrass in Saskatchewan by Soil Zone (1992 to 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Baylor	90	92	92	92
Magna	93	98	99	98
Rebound	94	96	94	95
Signal	102	99	93	97
Carlton	100	100	100	100
Check (Kg/Ha)	3500	6000	4870	4970

Smooth bromegrass yields were also highest in the dark brown soil zone (Table 2). Carlton out performed all other smooth brome varieties in the dark brown and black/gray wooded soil zones and when averaged over soil zones. Signal yielded 102% of Carlton in the brown soil zone.

Table 3 Relative Yield of Meadow Bromegrass Varieties in Saskatchewan by Soil Zone (1992 to 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Paddock	109	105	101	104
Regar	105	90	95	95
Fleet	100	100	100	100
Check (Kg/Ha)	3400	5250	4500	4530

Paddock Meadow bromegrass was consistently higher yielding than all other meadow bromegrass varieties tested (Table 3). Regar was lower yielding than the check, Fleet, in the dark brown and black/gray soil zones.

Table 4 Relative Yield of Crested Wheatgrass Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Fairway	104	88	86	90
Nordan	94	92	98	95
Parkway	106	93	93	96
Summit	111	92	94	97
Kirk	100	100	100	100
Check (Kg/Ha)	3560	5300	5160	4880

Parkway and Fairway crested wheatgrass yielded 106 and 104% of Kirk in the brown soil zone, respectively (Table 4). However, Kirk showed the highest relative yield in the dark brown, black/gray soil zone and when the data were averaged over soil zones.

Table 5 Relative Yield of Intermediate Wheatgrass Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Clarke	100	96	88	94
Greenleaf	91	94	99	96
Chief	100	100	100	100
Check (Kg/Ha)	4100	5560	5500	5230

Clarke intermediate wheatgrass performed similar to Chief in the brown soil zone (Table 5). However, Chief outperformed all other intermediate wheatgrass varieties in the dark brown, black/gray soil zones and when the data was averaged over soil zones.

Table 6 Relative Yield of Native Wheatgrass Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Type	Brown	Dark Brown	Black/Gray	Average
Elbee	Northern	89	61	70	70
Sodar	Streambank	76	61	65	64
Walsh	Western	72	57	68	65
Adanac	Slender	102	105	106	105
Revenue	Slender	100	100	100	100
Check (Kg/Ha)		3060	4490	5110	4490

Adanac Slender wheatgrass outperformed all native wheatgrass varieties in all soil zones (Table 6).

Table 7 Relative Yield of Altai Wildrye Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Eejay	101	91	96	95
Pearl	90	95	90	92
Prairieland	100	100	100	100
Check (Kg/Ha)	2540	5160	4550	4340

Eejay Altai wildrye yielded 101% of Prairieland in the brown soil zone (Table 7). However, Prairieland outperformed all other varieties in the dark brown and black/gray soil zones.

Table 8 Relative Yield of Russian Wildrye Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Cabree	96	91	103	98
Mayak	107	97	103	102
Tetracan	100	94	96	96
Swift	100	100	100	100
Check (Kg/Ha)	2170	4670	3810	3750

Russian wildrye variety ranking varied markedly among soil zones. Mayak was clearly superior in the Brown soil zone and had the highest average yield across soil zones (Table 8).

Table 9 Relative Yield of Dahurian Wildrye Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Arthur	92	96	95	95
James	100	100	100	100
Check (Kg/Ha)	2950	5470	5460	4990

James Dahurian wildrye consistently outperformed Arthur Dahurian wildrye in all soil zones and when averaged over soil zones (Table 9).

Table 10 Relative Yield of Reed Canarygrass Varieties in Saskatchewan by Soil Zone (1992 - 1996)

Variety	Brown	Dark Brown	Black/Gray	Average
Palaton	97	98	96	96
Rival	89	95	94	93
Venture	97	98	95	96
Vantage	100	100	100	100
Check (Kg/Ha)	1490	5000	5000	4390

Vantage reed canarygrass outperformed all reed canarygrass varieties in all soil zones and when the data were averaged over soil zones (Table 10). Rival was consistently the lowest yielding variety.

Table 11 Relative Yield of Grass Species Conducted Under Irrigation at Outlook and Swift Current (1992 - 1995)

Variety	Swift Current	Outlook	Average
Champ Timothy	97	103	100
Basho Timothy	94	105	100
Troy Kentucky Bluegrass	75	90	83
Kay Orchardgrass	74	84	79
Boreal Creeping Red Fescue	71	81	76
Climax Timothy	100	100	100
Check (Kg/Ha)	10200	13200	11700

Under irrigation, timothy markedly out-yielded kentucky bluegrass, orchardgrass and creeping red fescue (Table 11). Climax was the highest yielding at Swift Current, while, Champ and Basho timothy were the top yielders at Outlook. The three timothy varieties were similar in performance when the data was averaged over the two locations.

Table 12 Comparison of Forage Species for Forage Yield (kg/ha) by Soil Zones (1992 - 1996)

Variety	Species	Brown	Dark Brown	Black/Gray	Irrigation
Carlton	Smooth brome	3500 (4)	6000 (2)	4900 (5)	11100 (3)
Fleet	Meadow brome	3400 (5)	5300 (4)	4500 (6)	9600 (6)
Chief	Intermediate wheatgrass	4100 (1)	5600 (3)	5500 (2)	12000 (1)
Kirk	Crested wheatgrass	3600 (3)	5300 (4)	5200 (3)	12000 (1)
Revenue	Slender wheatgrass	3100 (6)	4500 (6)	5100 (4)	10400 (5)
Beaver	Alfalfa	4100 (1)	7000 (1)	6300 (1)	11100 (3)

Table 12 is a comparison of the yield of different forage species involved in the forage trials. Beaver alfalfa was the highest yielding forage in all three soil zones. Chief intermediate wheatgrass was equal to alfalfa in the brown soil zone and, together with Kirk crested wheatgrass, was the highest yielder under irrigation. Meadow bromegrass and slender wheatgrass were consistently among the lowest yielding species in all soil zones.

Table 13 Quality of Forage Species in Saskatchewan (1993-1996)

Variety	%CP	%NDF	%ADF	%TDN
Alfalfa	22	39	23	75
Smooth Brome	14	58	27	70
Meadow Brome	15	60	31	66
Intermediate Wheatgrass	11	59	30	67
Crested Wheatgrass	12	60	34	62
Tall Wheatgrass	11	60	30	68
Slender Wheatgrass	11	66	30	66
Northern Wheatgrass	13	60	32	64
Stream Bank Wheatgrass	13	62	33	62
Western Wheatgrass	14	58	30	67
Russian Wildrye	14	58	30	67
Altai Wildrye	12	60	29	67
Dahurian Wildrye	11	63	33	63
Reed Canarygrass	13	59	31	65

CP – crude protein
NDF – neutral detergent fibre
ADF – acid detergent fibre
TDN – total digestible nutrients

The data indicates that forage quality was quite variable among species. However, at the time of harvest, there was considerable variation in the stage of maturity among forage species (Table 13). As mentioned previously, the stage of maturity at harvest plays a major role in the quality of forage and would account for some of the variation in quality among forage species in this study. The data indicates alfalfa had a consistently higher quality than all of the grass species. Among the grasses, smooth brome was one of the higher quality species in this study, showing a lower ADF%.

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