

Forage Cultivar Trials

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In cooperation with



FORAGE CULTIVAR TRIALS

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FOREWORD

This report is the seventh for a special series of field trials conducted by the Agriculture Canada Research Station at Beaverlodge in cooperation with Alberta Agriculture.

The objective of this program is to provide relative information on seed production capability and general adaptability of named foreign cultivars of perennial grasses and legumes in northern Alberta. The information assists the Canadian forage seed industry in the development of production contracts and seed export markets. Emphasis is on crops economically suitable for the region and which currently form part of Canada's forage seed export industry.

The following test sites were selected to represent the major agronomic soils of the region.

1. Beaverlodge A. Research Station (SE-1-72-10-W6th)
Dark Gray Solod (Esher clay) to Dark Gray Luvisol (Hythe fine loam).
2. Beaverlodge B. Foster Farm (SE-25-71-10-W6th)
Near Beaverlodge, Alberta. Orthic Humic Gleysol (Goose fine loam to Codner clay).
3. Falher. Beaupre Farm (NW-1-78-21-W5th)
Near Falher, Alberta. Dark Gray Solod (Falher clay) to Solonetzic Gray Luvisol (Nampa clay).

4. Fort Vermilion. Experimental Farm (NW-13-108-13-W5th)
Dark Gray Luvisol (Leith coarse loam) to Orthic Gray Luvisol (Culp coarse loam).
5. Gimle. Driedger Farm (SW-30-72-10-W6th)
Near Beaverlodge, Alberta. Solonetzic Dark Gray Chernozemic (Albright clay) to Solonetzic Gray Luvisol (Hazelmere clay).
6. High Level. Fedeyko Farm (NW-35-109-17-W5th)
Near High Level, Alberta. Orthic Gray Luvisol (Davis fine loam) to Dark Gray Luvisol (Tangent fine loam).

Section A

Data presented in this section has been collected from stands established at the various test sites described above.

Plots comprise of four rows, 30.5 cm (1 foot) apart, 6.1 metres (20 feet) long, and are replicated 4 times. Weeds are controlled by mechanical and chemical means. Plots are fertilized annually in the autumn.

Seed and herbage (dry matter) yields are expressed as actual production per hectare and as a percent of a designated (*) standard. The Least Significant Difference at the 5% level is also presented for each test. Winter

survival is shown by a hardiness scale of 0 to 9, with 9 being the best.

Section B

Data presented in this section has been collected from screening trials established at the Beaverlodge Research Station. The purpose of these trials is to determine which cultivars should be tested at the various test sites of Part A.

Plots comprise of two rows, 30.5 cm (1 foot) apart, 6.1 metres (20 feet) long, and are replicated 3 times. Plot maintenance is the same as for Part A.

Seed and herbage yields are expressed by a 0 to 5 performance scale, with 5 being best. Winter hardiness is shown by a hardiness scale of 0 to 5, with 5 being best. Cultivars rated above 3 in the above three categories will be considered for further testing in Part A.

Section C

Data presented in this section contains a summary of forage seed yields collected from the various test sites established in northern Alberta. Only those cultivars licensed in Canada and cultivars eligible for certification under the OECD scheme are listed.

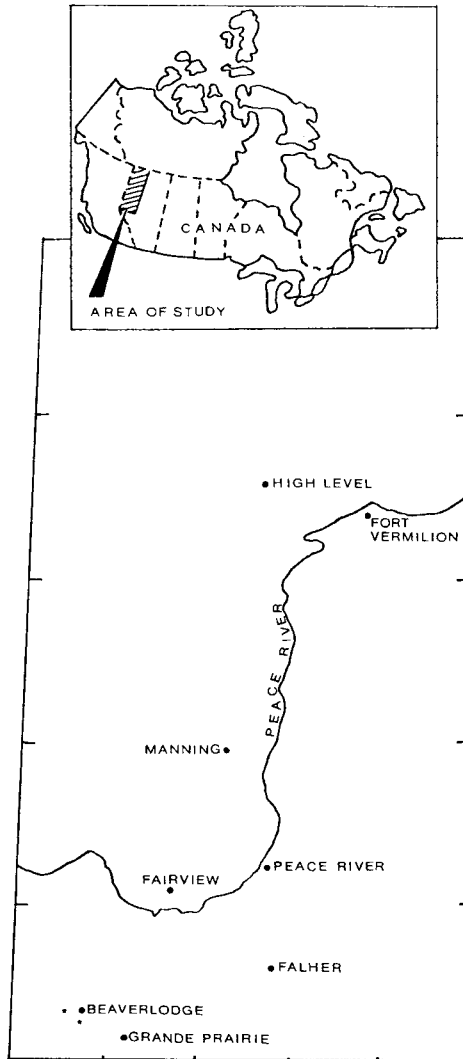
This publication will supplement "Forage Introductions Publication No. 79-16A-1979" which reports on all forages introduced since 1969.

Environmental data prepared by Mr. Peter Mills, Beaverlodge Research Station.

The author acknowledges the contributions of the following people to the program: L. Burgess, T. Cramer, A. Heggelund, R. Martin, M. Matheson and G. O'Neill.

Evaluation of this publication and suggestions for improvements will be greatly appreciated and should be directed to:

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ENVIRONMENTAL DATA FOR SELECTED SITES IN THE STUDY AREA

		Beaverlodge		Fairview		Fort Vermilion	
		1951-80	1984	1951-80	1984	1951-80	1984
Growing Degree Days							
Above 5°C	- May - Aug	988.8	971.8	1078.0	1172.6	1110.3	1105.8
Total Hours	- Annual	2125.5		2059.9		2106.9	
Bright Sun	May - Aug	1111.8	1079.2	1060.3	1104.5	1134.9	1050.4
Total Precip.-	Annual	467.0		446.6		382.5	
(mm)	May - Aug	235.2	206.5	236.8	339.4	201.7	355.9
Temperature (°C)							
Mean	- Annual	1.6		1.3		-1.2	
	May - Aug	13.0	12.8	13.7	14.5	13.9	14.0
Mean Maximum	- Annual	7.0		6.3		4.5	
	May - Aug	19.2	19.4	19.6	21.2	20.5	20.0
Mean Minimum	- Annual	-3.7		-3.6		-6.9	
	May - Aug	6.7	6.3	7.8	7.8	7.4	8.0
Photoperiod	- June 22	17:25		17:38		18:18	
Last Spring Frost	(0°C)	May 24	May 25	May 19	May 11	May 28	May 23
First Fall Frost	(0°C)	Sep 7	Sep 14	Sep 16	Aug 27	Sep 3	Sep 10
Frost Free Period	(days)	105	112	119	108	97	110

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A

Bromegrass		Test Site: Beaverlodge Research Station Seeding Year: 1982							
Cultivar	Origin	Hardiness	Height (cm)	Date Ripe		Seed Yield			
				1983	1984	kg/ha		% of Carlton	
						1983	1984	1983	1984
Beacon	Canada	9.0	116	Aug 12	Aug 9	401	402	47	66
Carlton*	Canada	9.0	113	Aug 12	Aug 9	847	605	100	100
Jubilee	Canada	9.0	109	Aug 12	Aug 9	135	635	16	105
Signal (S-8800)	Canada	9.0	124	Aug 12	Aug 9	1158	853	137	141
Svaja	Sweden	9.0	116	Aug 12	Aug 9	334	639	39	106
Mean						575	627		
L.S.D. (P = .05)						345	124		
		Test Site: Fort Vermilion Experimental Farm Seeding Year: 1982							
Beacon	Canada	9.0	114	Jul 26	Aug 8	374	303	49	40
Carlton*	Canada	9.0	120	Jul 26	Aug 8	758	750	100	100
Jubilee	Canada	9.0	112	Jul 26	Aug 8	283	483	37	64
Signal (S-8800)	Canada	9.0	121	Jul 26	Aug 8	777	1259	103	168
Svaja	Sweden	9.0	116	Jul 26	Aug 8	425	411	56	55
Mean						523	641		
L.S.D. (P = .05)						106	246		

Bromegrass		Test Site: Gimle Seeding Year: 1982				Seed Yield			
Cultivar	Origin	Hardiness	Height (cm)	Date Ripe		kg/ha		% of Carlton	
				1983	1984	1983	1984	1983	1984
Beacon	Canada	9.0	94	Aug 12	Aug 9	93	195	33	90
Carlton*	Canada	9.0	95	Aug 12	Aug 9	279	216	100	100
Jubilee	Canada	9.0	96	Aug 12	Aug 9	136	169	49	78
Signal (S-8800)	Canada	9.0	105	Aug 12	Aug 9	429	339	156	157
Svaja	Sweden	9.0	96	Aug 12	Aug 9	146	167	52	77
Mean						216	217		
L.S.D. (P = .05)						109	52		

Summary of Bromegrass Seed Yields
 1982 Seeding Year
 (Yields are shown as % of Carlton)

Cultivar	Origin	B'lodge A		B'lodge B		Falher		Fort Vermilion		Gimle		High Level		All Locations (Average)	
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Beacon	Canada	47	66	(a)		(b)		49	40	33	90	(b)		43	65
Carlton*	Canada	100	100					100	100	100	100			100	100
Jubilee	Canada	16	105					37	64	49	78			34	82
Signal (S-8800)	Canada	137	141					103	168	156	157			132	155
Svaja	Sweden	39	106					56	55	52	77			49	79
Carlton Yield in kg/ha		847	605					758	750	279	216			628	524

(a) Not seeded in 1982

(b) No stand establishment in 1982

Bromegrass		Test Site: Gimle Seeding Year: 1982											
Cultivar	Origin	1st Herbage Yield						2nd Herbage Yield					
		Day Cut		(DM)	t/ha	% of Carlton		Day Cut		(DM)	t/ha	% of Carlton	
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Beacon	Canada	Jun 22	Jun 14	1.02	1.31	68	131	Aug 18	Aug 16	0.91	0.76	120	103
Carlton*	Canada	Jun 22	Jun 14	1.49	1.00	100	100	Aug 18	Aug 16	0.76	0.74	100	100
Jubilee	Canada	Jun 22	Jun 14	0.88	1.04	59	104	Aug 18	Aug 16	0.80	0.62	105	82
Signal (S-8800)	Canada	Jun 22	Jun 14	1.51	0.99	101	99	Aug 18	Aug 16	0.85	0.84	112	114
Svaja	Sweden	Jun 22	Jun 14	1.16	1.24	78	124	Aug 18	Aug 16	1.03	0.94	136	127
Mean				1.21	1.12					0.87	0.78		
L.S.D. (P = .05)				0.63	0.28					0.43	0.24		

Summary of Bromegrass Herbage Yields
 1982 Seeding Year - 1983 Harvest
 (Yields are shown as % of Carlton)

Cultivar	Origin	B'lodge A		B'lodge B		Falher		Fort Vermilion		Gimle		High Level		All Locations (Average)	
		1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut
Beacon	Canada	83	89	(a)		(b)		82	58	68	120	(b)		78	89
Carlton*	Canada	100	100					100	100	100	100			100	100
Jubilee	Canada	16	58					47	92	59	105			41	85
Signal (S-8800)	Canada	70	100					116	111	101	112			96	108
Svaja	Sweden	58	100					92	103	78	136			76	113
Carlton Yield in (DM) t/ha		2.63	2.31					5.19	0.73	1.49	0.76			3.10	1.27

(a) Not seeded in 1982

(b) No stand establishment in 1982

Summary of Bromegrass Herbage Yields
 1982 Seeding Year - 1984 Harvest
 (Yields are shown as % of Carlton)

Cultivar	Origin	B'lodge A		B'lodge B		Falher		Fort Vermilion		Gimle		High Level		All Locations (Average)	
		1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut	1st Cut	2nd Cut
Beacon	Canada	87	90	(a)		(b)		88	96	131	103	(b)		102	96
Carlton*	Canada	100	100					100	100	100	100			100	100
Jubilee	Canada	71	75					104	115	104	82			93	91
Signal (S-8800)	Canada	90	85					115	108	99	114			101	102
Svaja	Sweden	116	88					109	98	124	127			116	104
Carlton Yield in (DM) t/ha		1.94	1.02					5.14	3.34	1.00	0.74			2.69	1.70

(a) Not seeded in 1982

(b) No stand establishment in 1982

Red Fescue

Test Site: Beaverlodge Research Station
Seeding Year: 1982

Cultivar	Origin	Hardiness	Height (cm)	Date Ripe		Seed Yield			
				1983	1984	kg/ha		% of Boreal	
						1983	1984	1983	1984
Boreal*	(3) Canada	9.0	73	Jul 28	Jul 25	261	1346	100	100
Carlawn	(3) Canada	9.0	71	Jul 28	Jul 25	359	1049	138	78
Fidelimo	(1) Netherlands	9.0	57	Jul 19	Jul 23	19	777	7	58
Leik	(3) Norway	9.0	76	Jul 26	Jul 23	152	1433	58	106
Luster	(1) Netherlands	9.0	60	Jul 22	Jul 19	6	379	2	28
Milda	(3) France	9.0	69	Jul 26	Jul 25	51	530	20	39
Oasis	(2) Netherlands	9.0	69	Jul 19	Jul 19	22	434	8	32
Valaska	(4) Czechoslovakia	9.0	69	Jul 19	Jul 19	203	771	78	57
Zernickower	(3) East Germany	9.0	76	Jul 28	Jul 25	183	813	70	60
Mean						140	837		
L.S.D. (P = .05)						207	270		

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified

Red Fescue

Test Site: Fort Vermilion Experimental Farm
Seeding Year: 1982

Cultivar	Origin	Hardiness	Height (cm)	Date Ripe		Seed Yield			
				1983	1984	kg/ha		% of Boreal	
						1983	1984	1983	1984
Boreal*	(3) Canada	9.0	66	Jul 11	Jul 16	103	1268	100	100
Carlawn	(3) Canada	9.0	72	Jul 11	Jul 16	92	1039	89	82
Fidelimo	(1) Netherlands	9.0	56	Jul 11	Jul 9	2	461	2	36
Leik	(3) Norway	9.0	70	Jul 11	Jul 16	104	701	101	55
Luster	(1) Netherlands	9.0	55	Jul 11	Jul 16	3	335	3	26
Milda	(3) France	9.0	65	Jul 11	Jul 16	1	427	1	34
Oasis	(2) Netherlands	9.0	61	Jul 11	Jul 9	7	175	7	14
Valaska	(4) Czechoslovakia	9.0	67	Jul 11	Jul 9	42	488	41	38
Zernickower	(3) East Germany	9.0	67	Jul 11	Jul 16	96	829	93	65
Mean						50	636		
L.S.D. (P = .05)						78	274		

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified

Red Fescue		Test Site: Gimle Seeding Year: 1982				Seed Yield			
Cultivar	Origin	Hardiness	Height (cm)	Date Ripe		kg/ha		% of Boreal	
				1983	1984	1983	1984	1983	1984
Boreal*	(3) Canada	9.0	76	Jul 23	Jul 24	412	775	100	100
Carlawn	(3) Canada	9.0	74	Jul 23	Jul 24	335	657	81	85
Fidelimo	(1) Netherlands	9.0	66	Jul 18	Jul 24	58	374	14	48
Leik	(3) Norway	9.0	77	Jul 23	Jul 24	262	868	64	112
Luster	(1) Netherlands	9.0	60	Jul 18	Jul 19	49	498	12	64
Milda	(3) France	9.0	71	Jul 22	Jul 24	122	408	30	53
Oasis	(2) Netherlands	9.0	64	Jul 18	Jul 24	72	361	17	47
Valaska	(4) Czechoslovakia	9.0	72	Jul 18	Jul 19	141	418	34	54
Zernickower	(3) East Germany	9.0	76	Jul 23	Jul 24	346	702	84	91
Mean						200	562		
L.S.D. (P = .05)						128	128		

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified

Summary of Red Fescue Seed Yields
1982 Seeding Year
(Yields are shown as % of Boreal)

Cultivar	Origin	B'lodge A		B'lodge B		Falher		Fort Vermilion		Gimle		High Level		All Locations (Average)	
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Boreal*	(3) Canada	100	100	(a)		(b)		100	100	100	100	(b)		100	100
Carlawn	(3) Canada	138	78					89	82	81	85			103	82
Fidelimo	(1) Netherlands	7	58					2	36	14	48			8	47
Leik	(3) Norway	58	106					101	55	64	112			74	91
Luster	(1) Netherlands	2	28					3	26	12	64			7	39
Milda	(3) France	20	39					1	34	30	53			17	42
Oasis	(2) Netherlands	8	32					7	14	17	47			11	31
Valaska	(4) Czechoslovakia	78	57					41	38	34	54			51	50
Zernickower	(3) East Germany	70	60					93	65	84	91			82	72
Boreal Yield in kg/ha		261	1346					103	1268	412	775			259	1130

(1) Rhizomes absent or rudimentary
(2) Slender rhizomes

(3) Strong rhizomes
(4) Unclassified

(a) Not seeded in 1982
(b) No stand establishment in 1982

Red Fescue

Test Site: Beaverlodge Research Station
Seeding Year: 1982

Cultivar	Origin	1st Herbage Yield						2nd Herbage Yield					
		Day Cut		(DM)	t/ha	% of Boreal		Day Cut		(DM)	t/ha	% of Boreal	
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Boreal*	(3) Canada	Jun 16	Jun 14	0.39	2.33	100	100	Aug 11	Aug 16	1.90	0.76	100	100
Carlawn	(3) Canada	Jun 16	Jun 14	0.43	1.80	110	77	Aug 11	Aug 16	1.38	1.00	73	132
Fidelimo	(1) Netherlands	Jun 16	Jun 14	0.12	2.46	31	106	Aug 11	Aug 16	0.29	0.76	15	100
Leik	(3) Norway	Jun 16	Jun 14	0.72	2.88	185	124	Aug 11	Aug 16	1.05	0.82	55	108
Luster	(1) Netherlands	Jun 16	Jun 14	0.03	2.05	8	88	Aug 11	Aug 16	0.26	0.88	14	116
Milda	(3) France	Jun 16	Jun 14	0.11	1.29	28	55	Aug 11	Aug 16	0.86	0.85	45	112
Oasis	(2) Netherlands	Jun 16	Jun 14	0.06	1.80	15	77	Aug 11	Aug 16	1.01	1.12	53	147
Valaska	(4) Czechoslovakia	Jun 16	Jun 14	0.35	3.61	90	155	Aug 11	Aug 16	0.69	0.71	36	93
Zernickower	(3) East Germany	Jun 16	Jun 14	0.28	1.72	72	74	Aug 11	Aug 16	1.27	1.09	67	143
Mean				0.28	2.22					0.97	0.89		
L.S.D. (P = .05)				0.32	0.68					0.50	0.27		

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified

Red Fescue

Test Site: Fort Vermilion Experimental Farm
Seeding Year: 1982

Cultivar	Origin	1st Herbage Yield						2nd Herbage Yield					
		Day Cut		(DM)	t/ha	% of Boreal		Day Cut		(DM)	t/ha	% of Boreal	
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984
Boreal*	(3) Canada	Jun 27	Jun 11	0.40	3.62	100	100	(a)	Aug 13		2.65		100
Carlawn	(3) Canada	Jun 27	Jun 11	0.30	3.31	75	91		Aug 13		2.68		101
Fidelimo	(1) Netherlands	Jun 27	Jun 11	0.06	1.34	15	37		Aug 13		0.75		28
Leik	(3) Norway	Jun 27	Jun 11	0.54	3.07	135	85		Aug 13		2.46		93
Luster	(1) Netherlands	Jun 27	Jun 11	0.07	2.03	18	56		Aug 13		0.78		29
Milda	(3) France	Jun 27	Jun 11	0.16	1.88	40	52		Aug 13		1.97		74
Oasis	(2) Netherlands	Jun 27	Jun 11	0.07	1.60	18	44		Aug 13		2.65		100
Valaska	(4) Czechoslovakia	Jun 27	Jun 11	0.16	3.38	40	93		Aug 13		1.58		60
Zernickower	(3) East Germany	Jun 27	Jun 11	0.54	3.39	135	94		Aug 13		2.53		95
Mean				0.25	2.62						2.01		
L.S.D. (P = .05)				0.27	0.54						0.45		

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified

(a) Second cut not taken

Red Fescue			Test Site: Gimle Seeding Year: 1982											
Cultivar	Origin	1st Herbage Yield						2nd Herbage Yield						
		Day Cut		(DM)	t/ha	% of Boreal		Day Cut		(DM)	t/ha	% of Boreal		
		1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	1983	1984	
Boreal*	(3) Canada	Jun 22	Jun 14	0.69	1.88	100	100	Aug 19	Aug 16	0.57	0.48	100	100	
Carlawn	(3) Canada	Jun 22	Jun 14	0.81	1.48	117	79	Aug 19	Aug 16	0.56	0.58	98	121	
Fidelimo	(1) Netherlands	Jun 22	Jun 14	0.23	1.82	33	97	Aug 19	Aug 16	0.15	0.42	26	87	
Leik	(3) Norway	Jun 22	Jun 14	0.90	2.14	130	114	Aug 19	Aug 16	0.32	0.41	56	85	
Luster	(1) Netherlands	Jun 22	Jun 14	0.31	2.18	45	116	Aug 19	Aug 16	0.18	0.36	32	75	
Milda	(3) France	Jun 22	Jun 14	0.56	1.44	81	77	Aug 19	Aug 16	0.80	0.67	140	140	
Oasis	(2) Netherlands	Jun 22	Jun 14	0.36	1.45	52	77	Aug 19	Aug 16	0.45	0.53	79	110	
Valaska	(4) Czechoslovakia	Jun 22	Jun 14	0.68	2.84	99	151	Aug 19	Aug 16	0.32	0.31	56	65	
Zernickower	(3) East Germany	Jun 22	Jun 14	0.75	1.72	109	91	Aug 19	Aug 16	0.59	0.51	104	106	
Mean				0.59	1.88					0.44	0.48			
L.S.D. (P = .05)				0.20	0.31					0.24	0.14			

- (1) Rhizomes absent or rudimentary
(2) Slender rhizomes
(3) Strong rhizomes
(4) Unclassified