

1983 Forage Cultivar Trials

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In cooperation with



FORAGE CULTIVAR TRIALS

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FOREWORD

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

The objective is to provide relative information on seed production capability and general adaptability of named foreign cultivars of perennial grasses and legumes to assist 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 Solonchic 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. Solonchic Dark Gray Chernozemic (Albright clay) to Solonchic 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).

Part A

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

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

Seed and Herbage (dry matter) yields are expressed both 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.

Part 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 two rows, 30.5 cm (1 foot) apart, 6.1 metres (20 feet) long, and 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.

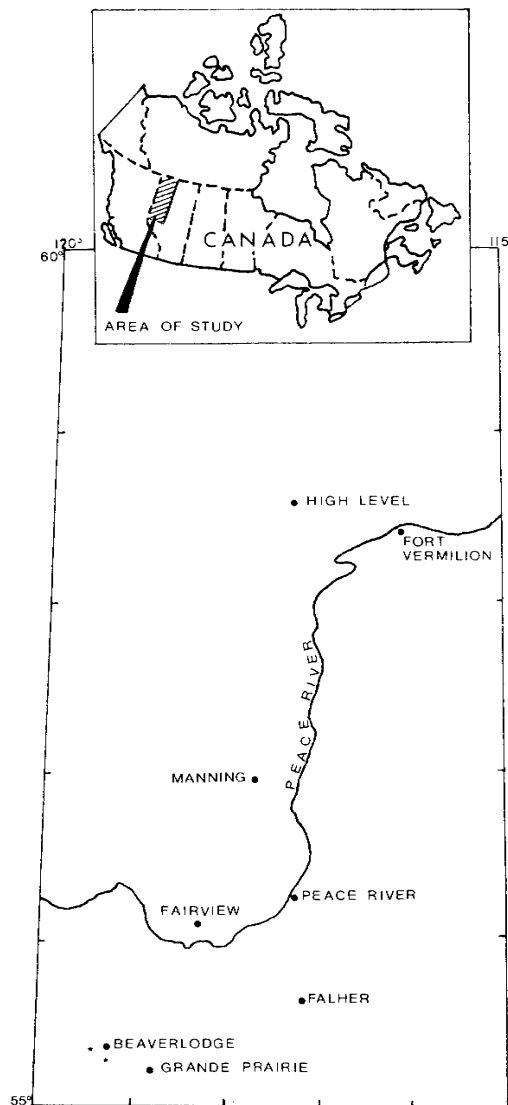
This publication will supplement "Forage Introductions Publication No. 79-16A-1979" which reports on all forages introduced since 1969.

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

The author acknowledges the contributions of the following people to the program: L. Burgess, T. Cramer, M. Howe, H. Klein-Gebbinck, S. Powers, H. Thomas, K. Wallan, and D. Wieliczko.

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	1983	1951-80	1983	1951-80	1983
Growing Degree Days (5°C)	1137.5	1143.3	1234.7	1233.8	1237.2	M*
Total Hours	Annual		Annual		Annual	
Bright Sun	2125.5		2059.9		2106.9	
	May - Sep		May - Sep		May - Sep	
	1275.6	1312.1	1225.8	1332.1	1284.9	1146.6E*
Total Precip. (mm)	Annual		Annual		Annual	
	467.0		446.6		382.5	
	May - Sep		May - Sep		May - Sep	
	277.2	354.7	271.3	313.8	236.4	195.8E
Temperature ($^{\circ}\text{C}$)	Annual		Annual		Annual	
Mean	1.6		1.3		-1.2	
	May - Sep		May - Sep		May - Sep	
	12.3	12.3	12.9	12.8	12.9	12.4E
Mean Maximum	Annual		Annual		Annual	
	7.0		6.3		4.5	
	May - Sep		May - Sep		May - Sep	
	18.4	18.2	18.7	18.1	19.3	18.7E
Mean Minimum	Annual		Annual		Annual	
	-3.7		-3.6		-6.9	
	May - Sep		May - Sep		May - Sep	
	6.1	6.4	7.1	7.5	6.5	6.0E
Photoperiod	June 22		June 22		June 22	
	17:25		17:38		18:18	
Last Spring Frost (0°C)	May 24	May 12	May 19	May 24	May 28	M
First Fall Frost (0°C)	Sep 7	Sep 8	Sep 16	Aug 17	Sep 3	M
Frost Free Period (days)	105	119	119	85	97	M

M*: Missing data - unable to estimate

E*: Estimated value adjusted for missing data

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PART A

Bromegrass

Test Site: Beaverlodge Research Station
Seeding Year: 1982

Cultivar	Origin	Hardi- ness	Height (cm)	Date Ripe 1983	Seed Yield	
					kg/ha 1983	% of Carlton
Beacon	Canada	9.0	115	Aug 12	401	47
Carlton*	Canada	9.0	114	Aug 12	847	100
Jubilee	Canada	9.0	100	Aug 12	135	16
Signal (S-8800)	Canada	9.0	124	Aug 12	1158	137
Svaja	Sweden	9.0	113	Aug 12	334	39
Mean					575	
L.S.D. (P = .05)					345	

Test Site: Fort Vermilion Experimental Farm
Seeding Year: 1982

Beacon	Canada	9.0	104	Jul 26	374	49
Carlton*	Canada	9.0	109	Jul 26	758	100
Jubilee	Canada	9.0	101	Jul 26	283	37
Signal (S-8800)	Canada	9.0	105	Jul 26	777	103
Svaja	Sweden	9.0	104	Jul 26	425	56
Mean					523	
L.S.D. (P = .05)					106	

Bromegrass

Test Site: Gimle
Seeding Year: 1982

Cultivar	Origin	Hardi- ness	Height (cm)	Date Ripe	Seed Yield	
					kg/ha 1983	% of Carlton
Beacon	Canada	9.0	96	Aug 12	93	33
Carlton*	Canada	9.0	99	Aug 12	279	100
Jubilee	Canada	9.0	94	Aug 12	136	49
Signal (S-8800)	Canada	9.0	108	Aug 12	429	156
Svaja	Sweden	9.0	96	Aug 10	146	52
Mean					216	
L.S.D. (P = .05)					109	

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

Cultivar	Origin	Beaverlodge A	Beaverlodge B	Falher	Fort Vermilion	Gimle	High Level	All Locations (Average)
Beacon	Canada	47	(a)	(b)	49	33	(b)	43
Carlton*	Canada	100			100	100		100
Jubilee	Canada	16			37	49		34
Signal (S-8800)	Canada	137			103	156		132
Svaja	Sweden	39			56	52		49
Carlton Yield in kg/ha		847			758	279		628

(a) Not seeded in 1982

(b) No stand establishment in 1982

Bromegrass

Test Site: Beaverlodge Research Station
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
Beacon	Canada	Jun 23	2.17	83	Aug 11	2.06	89
Carlton*	Canada	Jun 23	2.63	100	Aug 11	2.31	100
Jubilee	Canada	Jun 23	0.43	16	Aug 11	1.35	58
Signal (S-8800)	Canada	Jun 23	1.84	70	Aug 11	2.31	100
Svaja	Sweden	Jun 23	1.52	58	Aug 11	2.31	100
Mean			1.72			2.09	
L.S.D. (P = .05)			0.59			0.52	

Test Site: Fort Vermilion Experimental Farm
Seeding Year: 1982

Beacon	Canada	Jun 27	4.27	82	Aug 15	0.42	58
Carlton*	Canada	Jun 27	5.19	100	Aug 15	0.73	100
Jubilee	Canada	Jun 27	2.45	47	Aug 15	0.67	92
Signal (S-8800)	Canada	Jun 27	6.00	116	Aug 15	0.81	111
Svaja	Sweden	Jun 27	4.75	92	Aug 15	0.75	103
Mean			4.53			0.68	
L.S.D. (P = .05)			0.87			0.26	

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
Beacon	Canada	Jun 22	1.02	68	Aug 18	0.91	120
Carlton*	Canada	Jun 22	1.49	100	Aug 18	0.76	100
Jubilee	Canada	Jun 22	0.88	59	Aug 18	0.80	105
Signal (S-8800)	Canada	Jun 22	1.51	101	Aug 18	0.85	112
Svaja	Sweden	Jun 22	1.16	78	Aug 18	1.03	136
Mean			1.21			0.87	
L.S.D. (P = .05)			0.63			0.43	

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

Cultivar	Origin	Beaverlodge A		Beaverlodge 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

Red Fescue

Test Site: Beaverlodge Research Station
Seeding Year: 1981

Cultivar	Origin	Hardi- ness	Height (cm)	Date Ripe		Seed Yield				Herbage Yield			
				1982	1983	kg/ha		% of Boreal		(DM) t/ha		% of Boreal	
						1982	1983	1982	1983	1982†	1983†	1982	1983
Boreal*	(3) Canada	9.0	67	Jul 20	Jul 25	315	680	100	100	4.29	4.96	100	100
Carlawn	(3) Canada	9.0	64	Jul 20	Jul 28	252	616	80	91	3.82	5.38	89	108
Chiwago	(2) West Germany	9.0	64	Jul 20	Jul 22	67	289	21	43	2.44	4.47	57	90
Eboli	(1) Denmark	9.0	53	Jul 12	Jul 19	48	106	15	16	2.33	4.22	54	85
Falter	(1) West Germany	9.0	55	Jul 16	Jul 19	18	80	6	12	2.28	3.73	53	75
Futuro	(3) West Germany	9.0	70	Jul 20	Jul 28	80	128	25	19	3.75	5.33	87	107
Gavotte	(1) Netherlands	8.9	52	Jul 14	Jul 19	57	125	18	18	2.03	3.17	47	64
Hawk	(3) United Kingdom	9.0	65	Jul 20	Jul 28	169	575	54	85	3.71	5.18	86	104
Lirota	(1) West Germany	8.9	51	Jul 12	Jul 19	44	87	14	13	2.23	2.87	52	58
Lobi	(1) West Germany	8.9	50	Jul 12	Jul 19	70	290	22	43	2.33	2.53	54	51
Oasis	(2) Netherlands	9.0	53	Jul 12	Jul 19	24	30	8	4	2.73	4.16	64	84
Solfège	(1) France	8.7	55	Jul 19	Jul 28	8	238	3	35	1.61	3.03	38	61
Tridano	(3) Denmark	9.0	66	Jul 20	Jul 27	215	336	68	49	4.23	5.38	99	108
Mean						105	275			2.91	4.19		
L.S.D. (P = .05)						35	119			0.66	0.95		

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

† Two cuts combined

Red Fescue

Test Site: Beaverlodge Research Station
Seeding Year: 1982

Cultivar	Origin	Hardi- ness	Height (cm)	Date Ripe	Seed Yield	
					kg/ha 1983	% of Boreal
Boreal*	(3) Canada	9.0	64	Ju1 28	261	100
Carlawn	(3) Canada	9.0	66	Ju1 28	359	138
Fidelimo	(1) Netherlands	9.0	45	Ju1 19	19	7
Leik	(3) Norway	9.0	76	Ju1 26	152	58
Luster	(1) Netherlands	9.0	48	Ju1 22	6	2
Milda	(3) France	9.0	65	Ju1 26	51	20
Oasis	(2) Netherlands	9.0	49	Ju1 19	22	8
Valaska	(4) Czechoslovakia	9.0	56	Ju1 19	203	78
Zernickower	(3) East Germany	9.0	71	Ju1 28	183	70
Mean					140	
L.S.D. (P = .05)					207	

- (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	Hardi- ness	Height (cm)	Date Ripe	Seed Yield	
					kg/ha 1983	% of Boreal
Boreal*	(3) Canada	9.0	59	Jul 11	103	100
Carlawn	(3) Canada	9.0	66	Jul 11	92	89
Fidelimo	(1) Netherlands	9.0	48	Jul 11	2	2
Leik	(3) Norway	9.0	67	Jul 11	104	101
Luster	(1) Netherlands	9.0	47	Jul 11	3	3
Milda	(3) France	9.0	53	Jul 11	1	1
Oasis	(2) Netherlands	9.0	60	Jul 11	7	7
Valaska	(4) Czechoslovakia	9.0	59	Jul 11	42	41
Zernickower	(3) East Germany	9.0	61	Jul 11	96	93
Mean					50	
L.S.D. (P = .05)					78	

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

Red Fescue

Test Site: Gimle
Seeding Year: 1982

Cultivar	Origin	Hardi- ness	Height (cm)	Date Ripe	Seed Yield	
					kg/ha 1983	% of Boreal
Boreal*	(3) Canada	9.0	71	Jul 23	412	100
Carlawn	(3) Canada	9.0	69	Jul 23	335	81
Fidelimo	(1) Netherlands	9.0	60	Jul 18	58	14
Leik	(3) Norway	9.0	76	Jul 23	262	64
Luster	(1) Netherlands	9.0	48	Jul 18	49	12
Milda	(3) France	9.0	64	Jul 22	122	30
Oasis	(2) Netherlands	9.0	58	Jul 18	72	17
Valaska	(4) Czechoslovakia	9.0	62	Jul 18	141	34
Zernickower	(3) East Germany	9.0	71	Jul 23	346	84
Mean					200	
L.S.D. (P = .05)					128	

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

Summary of Red Fescue Seed Yields
 1982 Seeding Year - 1983 Harvest
 (Yields are shown as % of Boreal)

Cultivar		Origin	Beaverlodge A	Beaverlodge B	Falher	Fort Vermilion	Gimle	High Level	All Locations (Average)
Boreal*	(3)	Canada	100	(a)	(b)	100	100	(b)	100
Carlawn	(3)	Canada	138			89	81		103
Fidelimo	(1)	Netherlands	7			2	14		8
Leik	(3)	Norway	58			101	64		74
Luster	(1)	Netherlands	2			3	12		7
Milda	(3)	France	20			1	30		17
Oasis	(2)	Netherlands	8			7	17		11
Valaska	(4)	Czechoslovakia	78			41	34		51
Zernickower	(3)	East Germany	70			93	84		82
Boreal Yield in kg/ha			261			103	412		259

(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
Boreal*	(3) Canada	Jun 16	0.39	100	Aug 11	1.90	100
Carlawn	(3) Canada	Jun 16	0.43	110	Aug 11	1.38	73
Fidelimo	(1) Netherlands	Jun 16	0.12	31	Aug 11	0.29	15
Leik	(3) Norway	Jun 16	0.72	185	Aug 11	1.05	55
Luster	(1) Netherlands	Jun 16	0.03	8	Aug 11	0.26	14
Milda	(3) France	Jun 16	0.11	28	Aug 11	0.86	45
Oasis	(2) Netherlands	Jun 16	0.06	15	Aug 11	1.01	53
Valaska	(4) Czechoslovakia	Jun 16	0.35	90	Aug 11	0.69	36
Zernickower	(3) East Germany	Jun 16	0.28	72	Aug 11	1.27	67
Mean			0.28			0.97	
L.S.D. (P = .05)			0.32			0.50	

- (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
Boreal*	(3) Canada	Jun 27	0.40	100	+		
Carlawn	(3) Canada	Jun 27	0.30	75			
Fidelimo	(1) Netherlands	Jun 27	0.06	15			
Leik	(3) Norway	Jun 27	0.54	135			
Luster	(1) Netherlands	Jun 27	0.07	18			
Milda	(3) France	Jun 27	0.16	40			
Oasis	(2) Netherlands	Jun 27	0.07	18			
Valaska	(4) Czechoslovakia	Jun 27	0.16	40			
Zernickower	(3) East Germany	Jun 27	0.54	135			
Mean			0.25				
L.S.D.			0.27				

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

+ Second cut not taken