Forage Cultivar Trials

Northern Research Group Canada Agriculture Research Branch Research Station, Beaverlodge, AB

> 1988 Bulletin In cooperation with



FORAGE CULTIVAR TRIALS

G.M. Howe

1988

FOREWORD

3.

This report is the eleventh 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 grass'es 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 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).

Fort Vermilion. Experimental Farm (NW-13-108-13-W5th)

Dark Gray Luvisol (Leith coarse loam) to Orthic Gray Luvisol (Culp coarse loam).

A - Replicated Trials

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

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.

B - Screening Trials

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 yields are expressed as actual production per hectare. Winter hardiness is shown by a hardiness scale of 0 to 9, with 9 being best. Cultivars rated above 5 in hardiness will be considered for further testing in Part A.

C - Summary of Seed Yields

This section contains a summary of forage seed yield data collected from the various test sites established in northern Alberta. Only those cultivars registered in Canada and cultivars eligible for certification under the OECD scheme are listed.

Environmental data prepared by Mr. Peter Mills, Beaverlodge Research Station. The author acknowledges the contributions of the following people to the program: T. Cramer, A. Heggelund, C. Martin, C. Probst, F. Swanson, K. White and J. Woods.

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

G.M. Howe Agriculture Canada, Research Station Box 29 Beaverlodge, AB Canada TOH OCO Telephone (403) 354-2212

Cover Photo: Farm scene courtesy of the Alberta Photograph Library



ENVIRONMENTAL DATA FOR SELECTED SITES IN THE STUDY AREA

118.		Beave 1951-80	erlodge) 1988	Fair 1951-80		Fort Ve 1951-80	rmilion 1988
	Growing Degree Days Above 5°C - May - Aug	988.8	1038.8	1078.0	1116.9E	1110.3	1143.0
_	Total Hours _ Annual Bright Sun May - Aug	2125.5 1111.8	1044.8	2059.9 1060.3	977.8	2106.9 1134.9	776.7E
	Total Precip Annual (mm) May - Aug	467.0 235.2	239.6	446.6 236.8	412.3	382.5 201.7	419.5
N	Temperature (°C) Mean _ Annual May - Aug	1.6 13.0	13.4	1.3 13.7	13.8	-1.2 13.9	14.1
	Mean Maximum _ Annual May - Aug	7.0 19.2		6.3 19.6	19.2	4.5 20.5	-
	Mean Minimum _ Annual May - Aug	-3.7 6.7	6.8	-3.6 7.8	8.4	-6.9 7.4	8.6
	Photoperiod - June 22	17:25		17:38		18:18	
	Last Spring Frost (0°C)	May 24	May 15	May 19	May 4	May 28	May 10
	First Fall Frost (0°C)	Sep 7	Sep 10	Sep 16	Sep 17	Sep 3	Sep 10
-	Frost Free Period (days)	105	117	119	135	97	122
				,		57	12

E = Estimated Data

TABLE OF CONTENTS

A - Replicated Tri	als	Page		Page
			Red Clover (<u>Trifolium pratense L.</u>)	
Red Fescue (Festuc	a <u>rubra</u> L.)			
			Beaverlodge A 1987 - herbage	18
Beaverlodge A	1986 - seed	1	Beaverlodge B 1987 - herbage	19
Beaverlodge B	1986 - seed	2	Ft. Vermilion 1987 - herbage	20
Beaverlodge B	1987 - seed	6		
Ft. Vermilion	1987 - seed	7	<u>B - Screening Trials 1987- 1988</u>	
Beaverlodge A	1986 - herbage	3	Alfalfa (<u>Medicago sativa</u> L.)	22,28
Beaverlodge B	1986 - herbage	4	Birdsfoot Trefoil (Lotus corniculatus L.)	29
Beaverlodge B	1987 - herbage	8	Sainfoin (<u>Onobrychis viciifolia</u> Scop.)	22
Ft. Vermilion	1987 - herbage	9	Bromegrass (Bromus inermis Leyss.)	29
Summary	1986 - herbage	5	Meadow Fescue (Festuca pratensis Huds.; F. elatior auct.)	23
	0		Miscellaneous Fescue (Festuca ovina L., etc.)	23
			Red Fescue (Festuca rubra L.)	24
Timothy (Phleum pr	atense L.)		Tall Fescue (Festuca arundinacea Schreb.)	24
· · · · · · · · · · · · · · · · · · ·			Orchardgrass (Dactylis glomerata L.)	25,29
Beaverlodge A	1986 - seed	10	Redtop (Agrostis gigantea Roth.)	25
Beaverlodge B		11	Hybrid Ryegrass (Lolium x Boucheanum Kunth;	
			L. x hybridum Hausskn.)	25
Beaverlodge A	1986 - herbage	12	Perennial Ryegrass (Lolium perenne L.)	26,30 ·
Beaverlodge B	1986 - herbage	13	Timothy (Phleum pratense L.)	30
Summary	1986 - herbage	14	Crested Wheatgrass (Agropyron cristatum L.)	32
5 dilling F			Tall Wheatgrass (Agropyron elongatum Host)	32
Red Clover (Trifo)	lium pratense L.)			•
			C - Summary of Seed Yields	
Beaverlodge A	1987 - seed	15		
Beaverlodge B		16	Bromegrass (<u>Bromus inermis</u> Leyss.)	34
Ft. Vermilion		17	Red Fescue (Festuca rubra L.)	34
			Timothy (Phleum pratense L.)	37
			Red Clover (Trifolium pratense L.)	38
			and a state of the	

REPLICATED TRIALS

Red Fesc	ue	Test Site: Seeding Year:	0	Research Station
ltiver	Oninin	Wandiasaa	Voicht	

							Seed	Yield	
Cultivar	Orîgin	Hardiness	Height Da (cm) 198		Ripe 1988	kg/ 1987	ha 1988	7 of 1987	Boreal 1988
Accent	(3) Netherlands	***** 9.0 ***** ****	60	Jul 13	Jul 17	506	289	51	. 37
в 7733	(3) Canada	9.0	59	Jul 13	Jul 18	1019	866	102	112
Boreal *	(3) Canada	9.0	60	Jul 13	Jul 18	999	771	100	100
Ceres	(3) Netherlands	9.0	58	Jul 14	Jul 15	349	309	35	40
Claudia	(3) Netherlands	9.0	54	Jul 11	Jul 17	440	252	44	33
Logro	(4) Ireland	9.0	48	Jul 10	Jul 14	73	346	7	45
Szarvasi 58	(2) Hungary	9.0	63	Jul 13	Jul 18	540	666	54	86
Terhi	(3) Finland	9.0	64	Jul 13	Jul 18	765	806	77	105
Victor	(3) Netherlands	9.0	58	Jul 13	Jul 17	700	668	70	87
Mean L.S.D. (P = .05)						613.9 198.8	552.5 306.9		

-

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

(2) Strong rhizomes(3) Strong rhizomes(4) Unclassified

					Seed	Yield
Cultivar	Origin	Hardiness	Height	Date Ripe	kg/ha	Z of Boreal
			(cm)	1987 1988	1987 1988	1987 1988
Accent	(3) Netherlands	9.0	53	Jul 14 Jul 18	424 153	54 31
B 7733	(3) Canada	9.0	50	Jul 13 Jul 13 Jul 18	751 571	96 114
Boreal *	(3) Canada	9.0	51	Jul 13 Jul 20	781 493	100 100
Ceres	(3) Netherlands	9.0	50	Jul 15 Jul 18	194 100	25 20
Claudia	(3) Netherlands	9.0	48	Jul 12 Jul 18	289 135	37 27
rogto	(4) Ireland	9.0	40	Jul 10 Jul 14	64 188	8 33
Szarvasi 58	(2) Hungary	9.0	56	Jul 13 Jul 17	657 338	84 68
[erhi	(3) Finland	9.0	56	Jul 13 Jul 20	680 364	87 73
lictor	(3) Netherlands	9.0	53	Jul 13 Jul 18	493 334	63 67
lean	 A second sec second second sec	services for product spirit films of the	entrande en transferencia destructura por en	 Distribution of the second structure field of second second structure (second second seco	/03 2 207 0	and a physical contract of the set

Test Site: Beaverlodge B (Foster Farm)

Seeding Year: 1986

Mean L.S.D. (P = .05)

493.2 297.9 214.6 228.8

(1) Rhizomes absent or rudimentary

(2) Slender rhizomes

Red Fescue

(3) Strong rhizomes(4) Unclassified

Red	Fescue
-----	--------

Test Site: Beaverlodge Research Station Seeding Year: 1986

				Herbage Yi	eld (DM)	
		Cut l		Cut 2		Total
Cultivar	Origin	(t/ha)	Z of Boreal	(t/ha)	% of Boreal	X of (t/ha) Boreal
Accent	(3) Netherlands	1.84	74	1.40	99	3.24 83
в 7733	(3) Canada	2.74	110	1.47	104	4.21 108
Boreal *	(3) Canada	2.49	100	1.42	100	3.91 100
Ceres	(3) Netherlands	1.44	58	0.85	60	2.29 59
Claudia	(3) Netherlands	1.88	76	1.34	94	3.22 82
Logro	(4) Ireland	1.44	58	0.71	50	2.15 55
Szarvasi 58	(2) Hungary	2.88	116	1,83	129	4.72 121
Terhi	(3) Finland	3.26	131	1.99	140	5.25 134
Victor	(3) Netherlands	2.45	98	1.07	75	3.52 90
Mean L.S.D. (P = .05)		2.27 0.68		1.34 0.53		3.61 1.01

Herbage Yield (DM)

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

(3) Strong rhizomes(4) Unclassified

Test	Site:	Beaverlodge	В	(Foster	Farm)
Seeding	Year:	1986			

	Origin	Herbage Yield (DM)							
		Cut l		Cu	t 2	Total			
Cultivar		(t/ha)	Z of Boreal	(t/ha)	% of Boreal	(t/ha)	Z of Boreal		
Accent	(3) Netherlands	1.05	93	2.09	107	3.15	102		
в 7733	(3) Canada	1.73	153	2.19	ll12	3.92	127		
Boreal *	(3) Canada	1.13	100	1.95	100	3.08	100		
Ceres	(3) Netherlands	0.77	68	1.71	88	2.48	81		
Claudia	(3) Netherlands	0.95	84	2.31	118	3.25	106		
Logro	(4) Ireland	0.44	39	1.05	54	1.49	48		
Szarvasi 58	(2) Hungary	1.86	165	2.22	114	4.08	132		
Terhi	(3) Finland	1.52	135	2.55	131	4.07	132		
Victor	(3) Netherlands	1.06	94	1.87	96 juli	2.92	95		
Mean L.S.D. (P = .0)5)	1.17 0.52		1.99 0.53		3.16 0.89			

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

Red Fescue

(3) Strong rhizomes

(4) Unclassified