Annual Forage Dry Matter Trial

Note: Supported by Alberta's Agriculture Initiative Program in 2012 & 2013 and the Alberta Beef Producers in 2009 – 2011.

Background:
This project is part of a provincial initiative developed to evaluate the yield and quality potential of a number of annual crops grown for forage use. 2014 is the sixth year of this project which includes sites at 10 locations in the province. CARA's sites in the Special Areas represent the brown soil zone in east central Alberta. This report includes a summary of the results from 2010 – 2014 (drought conditions in 2009 resulted in no data). Data from previous CARA projects measuring yield of annual crops for forage yield is also included.

Objective:
To evaluate the forage potential of various annual crops when grown under dryland conditions.

Cooperators: James Madge, Stanmore NE 21-30-11-W4 (Special Area 2) (2010-2014)
Barry Redel, Consort NW 12-37-07-W4 (Special Area 4) (2010-2011)

Project Description:
Seeder: Henderson 500 plot drill with Morris contour openers
Seeding Rate: 24 plants per square foot for cereals
7 plants per square foot for peas
Previous Crop: Fallow
Seedbed Preparation: Glyphosate was applied prior to seeding
Seeding Depth: 2 - 2 ½ inches
Seeding Date: June 5
Plot Size: 1.4 m by 5 m, replicated 4 times in randomized block design
Fertilizer: None applied
Herbicides: MCPA Sodium on July 10
Harvest: The target harvest stage for all crops was soft dough.
Barley – September 2; Oats & Triticale – September 3

Site Information:
Table 1 **Soil Analysis**

Nutrient	Madge Site Spring 2014
Nitrogen (0-24)	305 lb/A (optimum)
Phosphorus (0-6)	115 lb/A (optimum)
Potassium (0-6)	1200 lb/A (excess)
Sulfate (0-24)	6434 lb/A (excess)
Soil Salinity (E.C.)	2021 (caution)
pH	7.4 (neutral)

Results:

Table 1 **Summary of Dry Matter Forage Yield**

	Stanmore				Consort (2010-2011)
	2014 Yield (lb/A)	2014 Yield as % Check	Average Yield①	Average Yield as % Check①	Average Yield as % Check②
Oats					
AC Juniper	-	-	7875	102 (2)	104
AC Morgan	6997	87	7373	98 (4)	104
AC Mustang	7799	97	7641	101 (4)	98
CDC Baler	6935	87	7822	105 (4)	102
CDC Haymaker	7849	98	8069	97 (2)	-
CDC Nasser	-	-			119
CDC SO-1	6043	75	6106	74 (2)	95
Derby	-	-	5050	77 (1)	101
Everleaf	-	-	6492	95 (2)	99
Foothills	8033	100	6875	92 (4)	112
Jordan	7434	93	7461	98 (4)	103
Murphy (check)	8009	100	7602	100 (4)	100
Waldern	6949	87	5674	92 (4)	104
Murphy/CDC Cowboy	-	-	7871	100 (2)	-
Murphy/ Pronghorn	-	-	8618	110 (2)	-
Mean	7182				
LSD (.05)	1182				
CV (%)	11.34				
Barley					
AC Lacombe	-	-	4224	121 (1)	94
AC Ranger	7257	110	10506	144 (2)	97
Amisk	6572	100	6572	100 (1)	-
Busby	6341	96	9757	121 (3)	109
CDC Austenson	6953	105	9001	115 (3)	97
CDC Coalition	6417	97	10878	100 (2)	-
CDC Cowboy	7009	106	8986	114 (3)	106
CDC Maverick	6854	104	8860	84 (1)	-
Chigwell	5547	84	8198	104 (3)	104
Conlon	4739	72	8946	85 (1)	-
Gadsby	7599	115	10374	96 (2)	-
Muskwa	7016	106	11537	109 (1)	-
Ponoka	6240	95	9408	121 (3)	98
Seebe	6581	100	8827	111 (3)	98
Sundre	6501	99	7645	99 (3)	96
Trochu	-	-	8570	107 (3)	96
Xena	6077	92	9138	111 (3)	92
Vivar (check)	6591	100	8414	100 (3)	100
Mean	6518				
LSD (.05)	1093				
CV (%)	11.77				

① 2010 - 2014 data combined * One year data only ② 2010 & 2011 data combined

Table 1 con't **Summary of Dry Matter Forage Yield**

	Stanmore				Consort (2010-2011)
	2014 Yield (lb/A)	**2014 Yield as % Check**	**Average Yield①**	**Average Yield as % Check①**	**Average Yield as % Check②**
Triticale					
AC Ultima	-	-	7688	102 (3)	94
CDC Bunker	4223	77	6077	90 (5)	108
Companion	-	-	7470	99 (3)	90
Pronghorn	5464	100	7473	100 (5)	100
Taza	5183	95	6235	92 (5)	87
Tyndal	4943	90	6948	94 (5)	94
Sunray	4237	78	4237	78 (1)	-
Mean	6561				
LSD (.05)	1108				
CV (%)	10.95				
Pulse Combinations					
Murphy	6280	102	7616	88 (3)	115*
Vivar	6178	100	8936	100 (3)	100*
Pronghorn	6083	98	7649	88 (3)	107*
40-10/Murphy	-	-	6855	67 (3)	93*
40-10/ Pronghorn	-	-	6166	61 (3)	81*
40-10/Vivar	-	-	6634	65 (3)	78*
CDC Horizon/ Vivar	5769	93	6114	76 (2)	-
CDC Meadow/ Vivar	5692	92	5692	92 (1)	-
CDC Horizon/ Pronghorn	5234	85	5548	70 (2)	-
CDC Meadow/ Murphy	5180	84	5180	84 (1)	-
CDC Horizon/ Murphy	5083	82	5693	70 (2)	-
CDC Meadow/ Pronghorn	4994	81	4994	81 (1)	-
Mean	5610				
LSD (.05)	1202				
CV (%)	14.68				

① 2010 – 2014 data combined; number of years tested in brackets

* One year data only

② 2010 & 2011 data combined

Table 2 **Feed Quality Analysis 2014 – Stanmore SIte**

	Feed Quality (as % of Check*)						
	Crude Protein	**ADF**	**TDN**	**Ca**	**P**	**K**	**Mg**
Oats							
AC Juniper	111	77	113	67	132	80	87
AC Morgan	110	75	114	76	132	83	73
AC Mustang	118	72	116	73	132	69	87
CDC Baler	108	71	117	88	121	81	87
CDC Haymaker	118	76	114	79	111	88	80
CDC SO-1	119	73	116	79	142	79	100
Foothills	129	76	114	85	116	84	80
Jordan	124	73	115	76	121	82	107
Waldern	94	75	114	82	126	75	73
***Murphy (Check)**	**9.24**	**41.39**	**56.66**	**0.33**	**0.19**	**2.58**	**0.15**
Barley							
Amisk	94	100	100	116	104	109	107
Busby (TR0663)	92	111	97	119	93	105	100
AC Ranger	94	113	96	113	93	111	100
CDC Austenson	85	97	101	69	89	94	86
CDC Coalition	95	97	101	81	107	121	86
CDC Cowboy	83	127	93	94	89	130	100
CDC Maverick	85	117	95	109	93	111	114
Chigwell	98	106	98	125	104	107	100
Conlon	88	94	102	91	115	81	93
Gadsby	88	104	99	119	93	123	100
Ponoka	99	103	99	116	119	120	114
Muskwa	100	97	101	103	100	91	100
Seebe	90	103	99	84	100	105	71
Sundre	103	92	102	94	115	111	100
Xena	92	96	102	81	104	96	93
***Vivar (Check)**	**13.44**	**24.48**	**69.83**	**0.32**	**0.27**	**1.49**	**0.14**
Triticale							
Bunker	108	109	96	80	130	79	107
Sunray	102	102	99	100	130	91	127
Taza (T198)	104	97	102	78	135	72	93
Tyndal	110	100	100	73	115	84	87
***Pronghorn (Check)**	**10.07**	**37.19**	**59.93**	**0.40**	**0.20**	**2.19**	**0.15**

Table 2 con't **Feed Quality Analysis 2014 – Stanmore SIte**

	Feed Quality (as % of Check*)						
	Crude Protein	**ADF**	**TDN**	**Ca**	**P**	**K**	**Mg**
Pulse Crop Block							
Murphy	97	88	106	69	95	168	78
Pronghorn	82	114	93	71	86	178	67
CDC Meadow/Vivar	131	89	105	164	127	129	117
CDC Meadow/ Murphy	96	113	94	131	86	185	106
CDC Meadow/ Pronghorn	126	100	100	114	114	185	94
CDC Horizon/Murphy	112	103	98	121	109	226	106
CDC Horizon/ Pronghorn	118	92	104	136	118	149	100
CDC Horizon/Vivar	112	118	91	219	86	145	128
***Vivar (check)**	**9.73**	**37.36**	**59.80**	**0.42**	**0.22**	**1.17**	**0.18**

Discussion:

Average dry matter production of the cereals included in the Annual Forage Trial in 2014 was generally slightly lower than the long term average yields at the site (Table 1).

Of the oat varieties tested, the Foothills and Murphy were the highest yielding in 2014, but CDC Baler has the highest long term yield. Gadsby and AC Ranger have produced the highest dry matter of the barleys in 2014 as well as ove the past 4 years. Pronghorn leads the triticale varieties in yield. All pea/cereal combinations were out yielded by the Vivar barley, but feed quality tended to be better in the combinations.

Protein levels of the 2014 treatments are typically more than adequate to maintain a beef cow from fall through calving. Supplementation of minerals may be recommended with some of the crops, so review of the analysis with a ration specialist or with the Cowbytes program is advisable.

Regional Silage Project Summaries

Note: The following tables were prepared by Alexander Fedko, Alberta Agriculture's coordinator of the Provincial Variety Testing program. The tables are based on data from various points in the province, including CARA's trial. Use the Yield Category column which best represents the conditions in your area when selecting varieties (for example low, medium or high moisture potential for the year).

BARLEY

Variety	Overall Yield	Overall Station Years of Testing	Area (t/ac)					Yield Category (% Vivar)		
			2	3	4	5	6	Low < 2.0 (t/ac)	Medium 2.0 - 4.0 (t/ac)	High > 4.0 (t/ac)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Vivar)										
Vivar (t/ac)	**4**		**4.7**	**4.8**	**3**	**4.5**	**2.5**	**1.7**	**3.3**	**5.2**
Vivar	**100**	**25**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Busby	100	25	99	101	94	105+	95	96	99	103
CDC Austenson	109+	25	103	105	127	106	109	121	104	110
CDC Coalition	98	25	103	96	104	91	106	102	95	100
CDC Cowboy	109+	25	99	110	120	109	108+	115	107	109
CDC Maverick	106	15	94	97	89	109	116	117	108	100
Chigwell	96-	25	90-	91	100	93-	105	110	92-	96
Conlon	91-	15	78-	92	98	85-	104	104	88	90-
Gadsby	109+	25	102	108	119	108+	111	123	105	109
Muskwa	96	15	108	90	102	90-	102	101	96	95
Ponoka	106	25	102	104	112	107+	104	115	101	108
Ranger	100	15	116	99	90	99	98	97	100	102
Seebe	105+	25	101	106	113	105	102	111	103	105
Sundre	95-	25	88	95	95	95	101	101	94	95
Trochu	97	24	96	92	101	99	94	103	94	96
Xena	103	25	97	108	106	101	107	106	103	103

BARLEY

Variety	Nutritional Data					
	CP (%)	TDN (%)	Ca (%)	P (%)	K (%)	Mg (%)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Vivar)						
Vivar (t/ac)	**10.5**	**66.2**	**0.4**	**0.2**	**1.3**	**0.2**
Vivar	**100**	**100**	**100**	**100**	**100**	**100**
Busby	99	99	97	104	96	88
CDC Austenson	101	100	82	106	102	88
CDC Coalition	100	100	80	107	102	84
CDC Cowboy	95	97	97	108	112	101
CDC Maverick	92	98	94	105	97	99
Chigwell	100	98	109	102	105	98
Conlon	92	99	88	112	94	84
Gadsby	98	99	100	106	99	93
Muskwa	98	99	108	106	116	97
Ponoka	96	99	114	105	102	97
Ranger	96	98	111	106	118	102
Seebe	104	97	102	114	110	87
Sundre	103	99	104	109	115	100
Trochu	99	101	102	109	103	99
Xena	101	100	82	111	97	86

OATS

Variety	Overall Yield	Overall Station Years of Testing	Area (t/ac)					Yield Category (% Murphy)		
			2	3	4	5	6	Low < 2.0 (t/ac)	Medium 2.0 - 4.0 (t/ac)	High > 4.0 (t/ac)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Murphy)										
Murphy (t/ac)	**3.9**		**3.8**	**4.7**	**3.2**	**4.4**	**1.9**	**1.6**	**3.4**	**4.8**
Murphy	**100**	**25**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
AC Juniper	95	20	96	98	95	85-	119	112	90	95
AC Morgan	101	25	101	95	100	97	122	111	99	100
AC Mustang	98	25	106	97	86	98	105	112	94	100
CDC Baler	96	24	85-	100	103	96	93	98	95	97
CDC Haymaker	99	17	98	100	125	95	102	117	99	97
CDC SO-I	94-	25	91	104	79-	95	95	98	90-	97
Everleaf	86	7	XX	98	108	73-	68	68	95	76
Foothills	99	25	95	97	107	98	102	110+	94	102
Jordan	98	25	107	96	84	97	108	107	95	99
Waldern	100	25	93	104	99	99	111	113	99	100

OATS

Variety	Nutritional Data					
	CP (%)	TDN (%)	Ca (%)	P (%)	K (%)	Mg (%)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Murphy)						
Murphy (t/ac)	**8.7**	**58.8**	**0.3**	**0.2**	**1.9**	**0.2**
Murphy	**100**	**100**	**100**	**100**	**100**	**100**
AC Juniper	121	107	100	116	99	108
AC Morgan	112	106	105	115	96	95
AC Mustang	124	105	98	110	98	100
CDC Baler	123	107	106	113	101	102
CDC Haymaker	119	106	104	110	103	99
CDC SO-I	119	107	101	105	99	105
Everleaf	117	104	112	107	100	102
Foothills	120	103	106	109	101	101
Jordan	119	105	100	106	97	112
Waldern	110	105	109	104	93	98

TRITICALE

Variety	Overall Yield	Overall Station Years of Testing	Area (t/ac)					Yield Category (% Pronghorn)		
			2	3	4	5	6	Low < 3.0 (t/ac)	Medium 3.0 - 4.5 (t/ac)	High > 4.5 (t/ac)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Pronghorn)										
Pronghorn (t/ac)	**4.2**		**4.3**	**4.4**	**3.4**	**4.8**	**2.1**	**2.5**	**4**	**5.3**
Pronghorn	**100**	**26**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Bunker	97	26	87	96	98	101	93	93	97	99
Sunray	97	17	85	94	129	99	90	87	101	98
Taza	100	26	96	102	95	102	96	101	97	101
Tyndal	95-	26	91	101	92	96	92	92	97	96

TRITICALE

Variety	Nutritional Data					
	CP (%)	TDN (%)	Ca (%)	P (%)	K (%)	Mg (%)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Pronghorn)						
Pronghorn (t/ac)	**9.3**	**62.8**	**0.2**	**0.3**	**1.4**	**0.1**
Pronghorn	**100**	**100**	**100**	**100**	**100**	**100**
Bunker	101	98	118	95	94	109
Sunray	108	102	111	100	97	102
Taza	99	100	108	103	94	97
Tyndal	96	100	102	99	91	98

PULSE MIXTURES

Variety	Overall Yield	Overall Station Years of Testing	Area (t/ac)					Yield Category (% Vivar)		
			2	3	4	5	6	Low < 2.0 (t/ac)	Medium 2.0 - 4.0 (t/ac)	High > 4.0 (t/ac)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Vivar)										
Vivar (t/ac)	**3.5**		**3.7**	**4.3**	**2.3**	**3.4**	**3.1**	**2.5**	**3.5**	**4.7**
Vivar	**100**	**25**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Murphy	116	24	94	107	157	126+	98	124	117	107
Pronghorn	110	25	98	95	109	119+	112	107	112	108
40-10/Murphy	96	18	55	76	132	102	95	105	97	75
40-10/Pronghorn	95	18	62	78	113	103	97	99	94	92
40-10/Vivar	94	18	70	77-	108	94	116	101	94	83
CDC Horizon/Murphy	108	25	67	97	144	120	97	112	107	106
CDC Horizon/ Pronghorn	106	25	76	91	132+	113	112	108	110	97
CDC Horizon/Vivar	99	25	84	94	112	103	98	95	102	96
CDC Meadow/ Murphy	110	7	84	105	XX	125+	103	84	109	121+
CDC Meadow/ Pronghorn	103	7	81	91	XX	117	106	81	112	101
CDC Meadow/Vivar	104	7	92	94	XX	116	98	92	113	98

PULSE MIXTURES

Variety	Nutritional Data					
	CP (%)	TDN (%)	Ca (%)	P (%)	K (%)	Mg (%)
Varieties tested in the 2012 - 2014 trials (Yield and agronomic data only directly comparable to Vivar)						
Vivar (t/ac)	**9.3**	**63.2**	**0.4**	**0.2**	**1.4**	**0.2**
Vivar	**100**	**100**	**100**	**100**	**100**	**100**
Murphy	90	95	76	101	126	89
Pronghorn	102	101	62	110	101	77
40-10/Murphy	130	98	153	122	119	133
40-10/Pronghorn	125	97	148	117	103	126
40-10/Vivar	143	99	174	112	106	137
CDC Horizon/ Murphy	111	95	125	99	126	111
CDC Horizon/ Pronghorn	124	98	139	106	107	105
CDC Horizon/Vivar	130	98	157	107	105	117
CDC Meadow/ Murphy	104	95	116	101	129	95
CDC Meadow/ Pronghorn	122	99	124	113	111	95
CDC Meadow/Vivar	115	100	197	89	105	129

Perennial Forage Trial

Thank you to SeCan, Hannas, Viterra and Brett Young for providing seed for this trial

Summary:
A number of alfalfa and grasses were planted in late June of 2013 for evaluation of yield and adaptability to conditions in the brown soil zone of the Special Areas. The forage varieties were arranged into blocks for each species and within each block, the varieties were randomized. Four replications of each variety were seeded into chem-fallow at recommended rates for dryland production. Weed control included a pre-seed application of glyphosate plus an application of Pardner in late July. Subsequent weed growth was mowed in late August. Growth of the plots was not sufficient for yield clips in 2013. Limited soil moisture, accompanied by late frost in the spring of 2014 hindered 2014 growth. Weed competition also impacted some plots so the grass and legume (other than alfalfa) blocks were not harvested. The alfalfa block was harvested, but unfortunately the frost had reduced yields and the data was too variable to report. Precipitation received periodically at the site during July and August will have contributed to the health and productivity of the stand. Yield be monitored in 2015 to determine if production variability has improved. Patience tends to be a virtue in the establishment of perennial forages in the Special Areas.

Objective:
To evaluate the yield potential of a number of alfalfa and grass varieties when grown under dryland conditions in east central Alberta.

Cooperator: Aaron Rude, Sedalia SW 14-31-06-W4

Project Details:
Seeder: Fabro double disc plot drill
Previous Crop: Chem fallow
Seedbed Preparation: Glyphosate prior to seeding
Seeding Date: June 27, 2013
Seeding Depth: ½ - ¾ inch
Row Spacing: 14 inches
Plot Size: 7 feet by 15 feet
Fertilizer: 30 lb/A 11-52-0

Species and Varieties Included in the Trial:

			Seeding Rate
Alfalfa:	Able	Heinrichs	7 lb/A
	AC Blue J	Rambler	
	AC Grazeland	Rangelander	
	Beaver	Spredor 4	
	Halo	Spyder	
	Hannas HiTech	Survivor	
	Magnum 38801 Wet	Yellowhead	

Other Legumes:	Oxley Cicer Milk Vetch	14 lb/A
	AC Oxley II Cicer Milk Vetch	14 lb/A
	Sainfoin	30 lb/A
	Bull Birds Foot Trefoil	10 lb/A

Grasses:

Fairway Crested Wheatgrass	7 lb/A
Kirk Crested Wheatgrass	7 lb/A
AC Saltlander Green Wheatgrass	8 lb/A
Greenleaf Pubescent Wheatgrass	10 lb/A
Canada Wild Rye	12 lb/A
Medallion Perennial Rye Grass	10 lb/A
Russian Wildrye Grass	8 lb/A
Dahurian Wildrye Grass	10 lb/A
AC Admiral Meadow Brome	12 lb/A
AC Armada Meadow Brome	12 lb/A
Fleet Meadow Brome	12 lb/A
Carlton Smooth Brome	10 lb/A
Kootenay Orchard Grass	6 lb/A
Killarney Orchard Grass	6 lb/A
Sheep Fescue	8 lb/A
Boreal Creeping Red Fescue	5 lb/A
Common Kentucky Bluegrass	5 lb/A
Western Wheatgrass	16 lb/A
AC SharpTail Needle and Thread Grass	10 lb/A
Tall Wheatgrass	20 lb/A
AC Polar Northern Wheatgrass	10 lb/A

Invasive Weed Control Demonstration

Note: *Funding for this project was provided by Dow AgroSciences and the Commission for Environmental Cooperation*

Background:

Absinth is a shrub-like perennial with a strong sage type odor which can grow up to four feet in height. Plants grow from seed, taking advantage of bare soil around gopher holes or dugout spill piles, and also re-grow annually from existing crowns. The plant flowers from late July until September.

Cattle will not graze absinth by choice and if consumed, milk can be tainted. Absinth began invading ditches near the home yard of Veno Ranches following road construction several years ago and then moved into adjacent native and reseeded pastures. Landowner Marj Veno has battled the weed with mowing and limited spot spraying but it continues to thrive and invade more and more acres each year. Further spread of this competitive plant will reduce the quality and amount of desirable forage.

Cooperator: Veno Ranches, Hanna NW 2-32-12-W4

Description:

Demonstrations consisting of side-by-side applications of various herbicide treatments were established in native and reseeded pastures northeast of Hanna in 2014. Adjacent areas were mowed with a 3 point hitch flail mower. Several points were also spot sprayed with one of the herbicides.

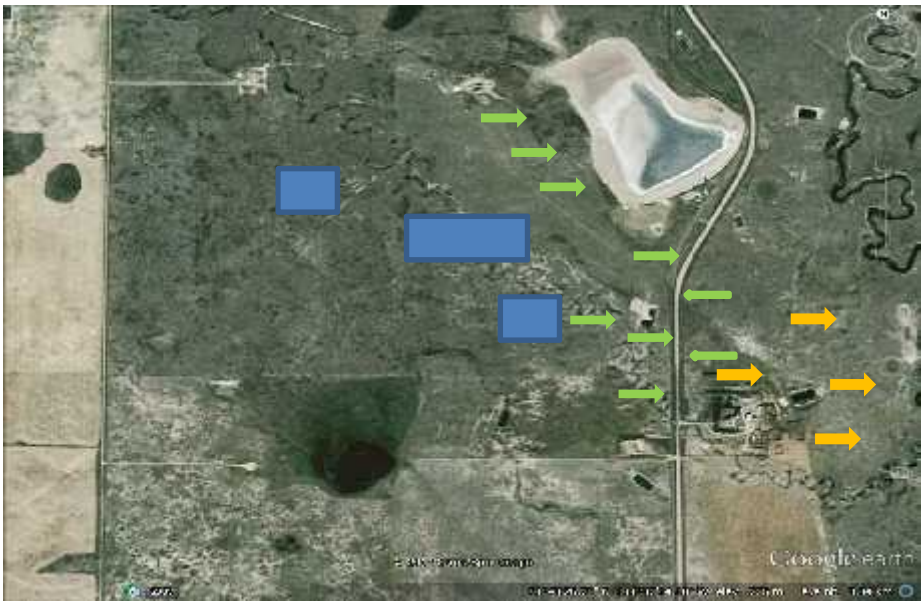
An inventory of plant composition was made on treatment strips in mid June. Photos were taken at various points in the pastures during the summer and early fall to monitor control of the absinth.

Treatments:

.7 L/A of 2,4-D
1 L/A Restore II
.7 L/A Reclaim

June application

July application



Herbicide Demo (Restore II, Reclaim, 2,4-D)

Mowed

Spot sprayed (Restore II)

Observations:

Absinth and other broadleaf plants were found dead two weeks following the June applications of the Restore II, Reclaim and the 2,4-D treatments. Western snowberry also showed considerable damage by the Reclaim.

Marj Veno shared project information in a Producer Panel at the Western Canadian Grazing Conference in Edmonton in December. Further spot spraying and monitoring will be conducted in 2015. Successful treatments will be identified as those with no re-growth from the crowns of plants sprayed in 2014. A Field Day is also planned to share the results with other local producers.

Mowed treatment

Spot sprayed absinth

Winter Grazing Management Demonstrations

Note: Funding from the Commission for Environmental Corporation supported these projects

Background:

Annual grazing systems typically include a combination of native forage, re-seeded forage and harvested annual and/or perennial crops. Traditionally, cattle were brought home in the winter and fed in confined areas. Many producers are now looking at options to extend the grazing season and thereby reduce yardage costs. Various methods can be used to keep the cattle out in the fields in the fall or winter such as swath or bale grazing or using stockpiled forage. While native forage is a valuable feed resource during the growing season, retention of nutritive qualities make stockpiling of some native species a choice for fall or winter grazing. Maintaining quality of these native pastures may require extra management, however, to ensure overgrazing of specific areas does not occur, that natural shelter (shrubs and trees) are not damaged, and that manure does not accumulate in undesirable amounts.

A side benefit to extended grazing practices is the value of nutrients which the cattle spread onto the fields. Perennial forage areas typically receive the least fertilizer inputs in most operations. The cows are a natural fertility machine as the manure that they create has nutritional qualities that are beneficial to the soil – all at no cost. Urine typically has a high concentration of nitrogen, and manure contributes a number of minerals plus organic matter. Habitat for beneficial bugs and micro-organisms is also enhanced. Strategic selection of grazing areas can improve soil nutrient levels which can be very beneficial to subsequent crops. While bale grazing may be the most convenient method of placing nutrients in specific areas (eg. knolls or other areas which are typically low in soil available nutrients), any practice which keeps cows on the field rather than in confined areas can improve soil conditions.

A few cautions must also be kept in mind in relation to extended grazing systems. Importing feeds into perennial or cultivated fields can also bring along new weed species, resulting in poorer quality forage or increased costs for weed control. If the cattle aren't cleaning up the feed they are allowed access to, the excess waste may have to be managed so the perennials will still grow or in order to provide a good seed bed for next year's annual crop. Extreme manure build-up in bedding or loafing areas can also cause excess nutrient accumulation, which is an environmental concern. This isn't often a problem in the brown soil zone, where nutrient levels are typically low. Run-off from these areas can impact surface water quality as well.

Note: see the Water Inventory Report in the Conservation Section.

Objectives:

To demonstrate management practices related to winter grazing options for cattle.
To demonstrate management practices which maintain native forage resources in a grazing system.
To demonstrate improvements in soil qualities from bale grazing.

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Project Cooperators: Gould Ranching Ltd., Consort S 26-25-06-W4
Veno Ranches, Hanna

Gould Ranching Ltd. Project

This project will demonstrate and enhance the use of bale grazing as a late fall or winter grazing resource within the Gould Ranches annual feeding program. Providing a portable windbreak will enable the Gould cows to bale graze during the late fall and early winter months without destroying natural brush and shrubs. Manure from the cows will also remain on the field instead of being concentrated within the natural brush or within a confined feeding facility at the home yard. Nutritional characteristics of native range make it a valuable asset during the late summer through to winter, but overgrazing during this period can jeopardize the health and presence of desirable species. Bale grazing on the hayland will help maintain a healthy range component of the Gould's grazing program.

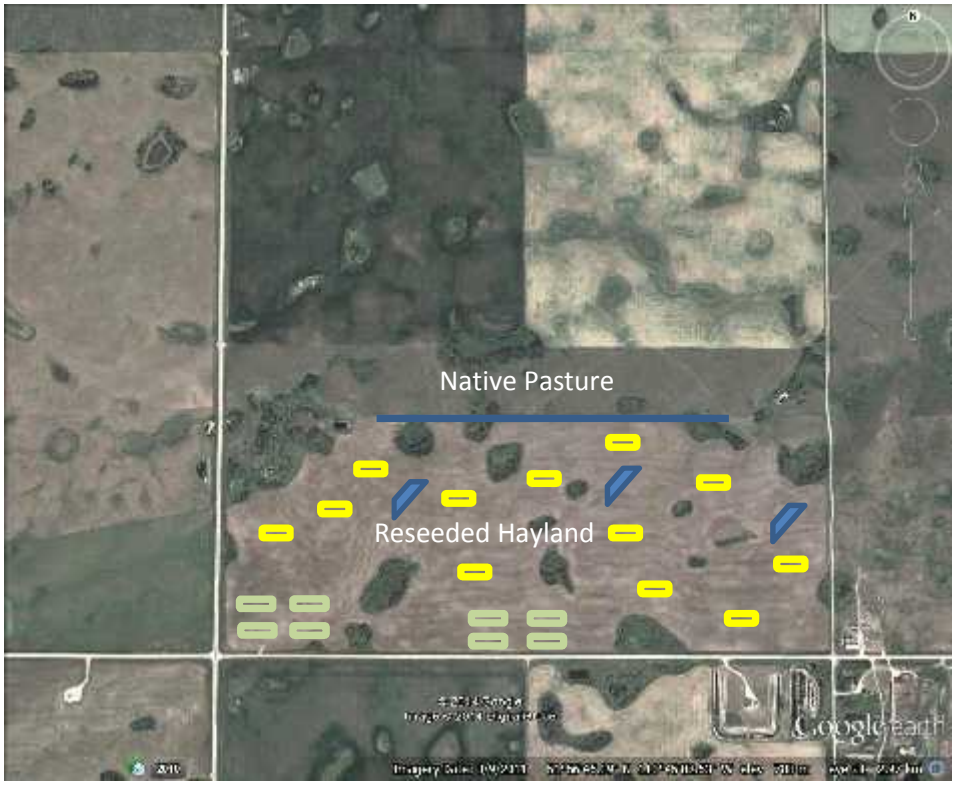
Grazing days achieved at the site is one factor which will be measured, as well as damage to existing shrubs and the distribution of manure. The impact on soil quality will also be monitored and compared to benchmarks established in 2013. Analysis will include basic soil chemistry, organic matter and microbial populations.

Progress to date:

- 2014 forage production was cut and baled into square bales measuring 5 x 3 feet.
- Bales were left where they dropped from the baler
- Bales produced on other hayfields were hauled to the project site and strategically placed to enhance soil deficiencies. The *Wintering Site Assessment and Design Tool* and *ARD's Nutrient Calculator* were consulted when determining the appropriate areas for bale placement.

- Samples were collected from representative groups of bales throughout the field for analysis of feed qualities.
- A dugout located on the property was modified with an energy efficient sundog solar off-site watering source.
- 90 heifers were moved to the site December 27th .
- The grazing herd was increased to 490 head on Jan 30th
- Wind shelters have been moved as the cows have been given access to different areas of the field and to manage the manure accumulation
- Access to bales has been restricted by electric fencing.
- Body condition is monitored
- The cows will be provided with pelleted grain if deemed necessary to maintain the desired body condition.
- It is anticipated the feed will be sufficient for the cows until March 15

- Soil samples will be taken at several points in the field as early as possible in the spring of 2015 to monitor soil changes from the bale grazing and use of portable shelters.
- Matthew presented a summary of the project as part of a Producer Panel at the Western Canadian Grazing Conference in Edmonton in December



Random bale placement (where they dropped from baler)
Planned placement of imported feed
Potential placement of wind shelters

Grazing notes to date:
The bales weighed about 650 lbs. and are 8 by 3 feet, allowing 16 cows to eat around each one. A target consumption of 40 lbs/day was used to determine how many bales the cows have access to for a specific period of time, eg. 215 cows were given access to 75 bales approximately every 6 days. Matthew Gould comments *"the cows are using the square bales efficiently, with less waste compared to that of large round bales".* They have also found large squares easy to prepare for feeding as the 4 large strings come off easy from the bale. Some trouble was experienced with the electric fence once the cows started pushing towards the intensively placed bales, even though there was lots of feed remaining in fenced area of randomly placed bales. It seemed the fencing unit may have been under-powered. They also found the cows preferred the natural bush shelter rather than the windbreaks if they had access to both. The cows seemed more content when grazing the randomly spaced bales rather than those

intensively placed, and they respected the electric fence better when they had more space as well.

Veno Ranches Project

The majority of the forage resources at Veno Ranches is native range, with specific native pastures targeted at different times of the year. Grazing management strategies within the operation must be flexible, and reflect annual production levels, cow numbers and of course the weather. Native range close to the ranch site has often gone under-utilized because a lack of shelter generally brings the cows close to home during the winter even though there is lots of nutritious forage material available.

This project monitors the use of portable windbreaks to better utilize the native pasture in section 2-32-12-W4 while enhancing the long term sustainability of this forage system as well as the soil and water resources in the pasture. Use of the portable wind breaks will help prevent the concentration of manure in or near a confined feeding facility at the home yard as well as preserve the limited natural shelter in the native pasture.

- Concepts documented in *The Wintering Site Extension and Design Tool,* created by AAFC, ARD and ARECA, were used to evaluate alternative locations for winter grazing.
- A target area without natural shelter was selected as a wintering site.
- Soil samples were taken at various points in the section as a benchmark for monitoring soil changes
- Samples were taken of the stockpiled native species within the targeted grazing area
- Late summer rains enhanced the quantity and quality of the native stand for winter feed for pregnant cows
- Historical knowledge of the site and forage availability was noted
- Riparian areas along the Berry Creek which flows through the section were observed to be in excellent condition
- Wind breaks have been moved onto the selected locations and will be moved periodically to prevent excessive nutrient accumulation from the manure.
- A group of approximately 125 young and older cows have been selected for the project and began grazing in the section in December
- The cows will have access to small holding ponds along the Berry Creek.
- These sites will be monitored to ensure access to water is not detrimental to the Creek.
- Body condition of the cows will be evaluated periodically to ensure they are getting adequate nourishment and supplementation will be provided if necessary.
- Soil samples will again be collected at the site in 2015. Quality of forage species will also be monitored.

Excellent quality and supply of native species was available for winter grazing with lots of thatch.

Proposed area for wind break shelters