Perennial Forage Variety Evaluation at multiple Alberta sites

2016 – 2018 West-Central Forage Association

Project Lead: Dianne Westerlund, Chinook Applied Research Association (CARA)
Co-Investigators:

- Akim Omokanye, Peace Country Beef and Forage Association (PCBFA)
- Alyssa Krone, Lakeland Agricultural Research Association (LARA)
- Barry Yaremcio, Alberta Agriculture and Forestry (AAF)
- Fito Zamudio Baca, West Central Forage Association (WCFA)
- Vance Yaremko, Smokey Applied Research and Demonstration Association (SARDA)
- Khalil Ahmed, Battle River Research Group (BRRG)
- Laura Gibney, Foothills Forage and Grazing Association (FFGA)
- Mackenzie Applied Research Association (MARA)
- Nora Paulovich, North Peace Applied Research Association (NPARA)
- Sandeep Nain, Gateway Research Association (GRO)

Objectives

A. The species/variety trials will target the following objectives:
   1. To provide unbiased, current and comprehensive regional data regarding the establishment, winter survival, yield and economics of specific species and varieties of perennial forage crops.
   2. To identify perennial crop species/varieties that demonstrate superior establishment, hardiness, forage yield and nutritional quality characteristics in different eco-regions of Alberta.
   3. To assess any benefits from growing mixtures of selected species.

B. The demonstration component will target the following objectives:
   1. To demonstrate the regional adaptability of various forage species and varieties.
   2. To demonstrate the regional adaptability of various grasses and legumes when planted in mixed stands.

Background

The majority of the annual feed requirement of Alberta's cow herd comes from perennial forages, including both grass and legume. Two thirds of the total cost of maintaining the cow herd is comprised of pasture, stored feed and bedding (Alberta Agriculture's Agriprofits Benchmarks). Therefore managing the supply of perennial forage is very important. Identification of high yielding varieties for different areas of the province will contribute to a positive economic return.

Rachael performing plant heights, summer 2017.

Forage producers in Alberta have had limited access to information on new perennial crops in recent years. This project is intended to bridge the information gap by evaluating a number of species and varieties at several locations in Alberta. It includes test cultivars which have been developed in recent years but have had limited regional evaluation beside varieties which are commonly grown in the province. Producers will have access to data applicable to regional conditions from the eight test sites in the province.

Forage varieties

Cultivars on this trial, include 11 kinds of grass and 14 kinds of legumes and 9 grass/legume mixtures.

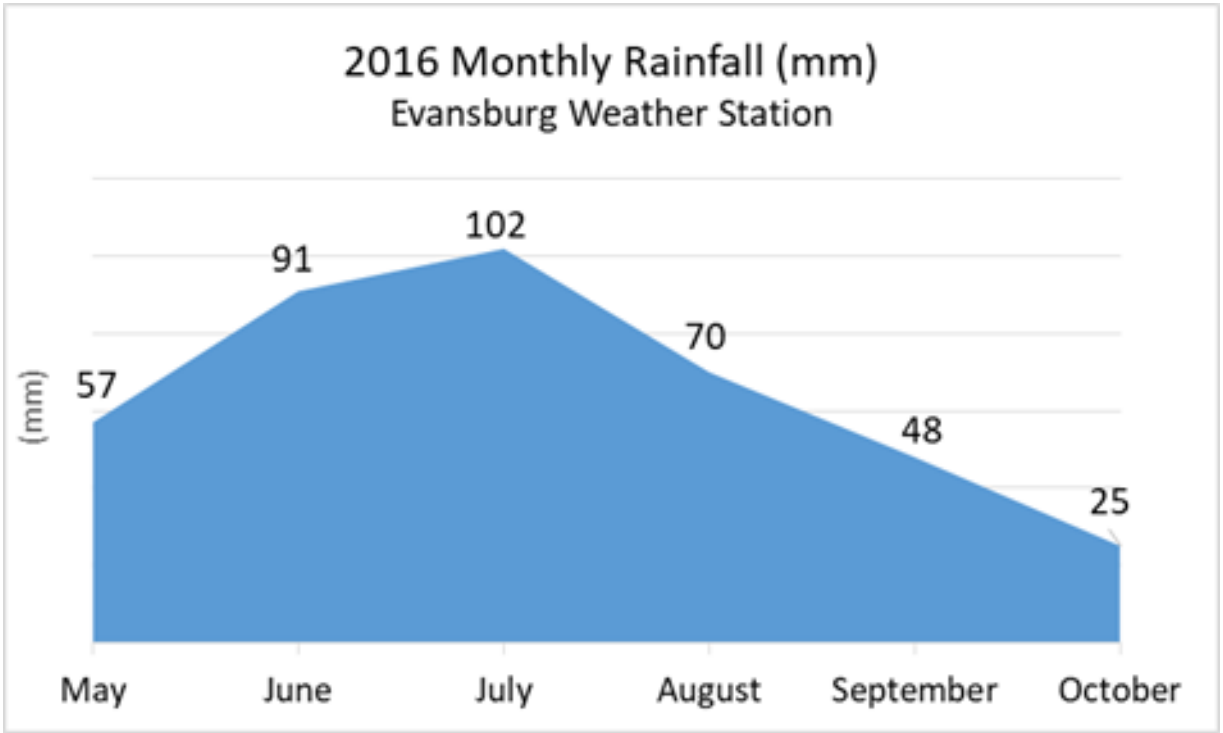
	Species	Variety	Seeding Rate (lbs/ac)
Grasses	**Meadow Brome**	AC Armada	14
	Meadow Brome	Fleet	14
	Meadow Brome	AC Admiral *(low germ)*	18
	Hybrid Brome	Success	12
	Hybrid Brome	Knowles	12
	Wheatgrasses		
	Pubescent	Greenleaf	10
	Intermediate	Chief	10
	Crested	Kirk	6
	Green Wheatgrass	AC Saltlander	9
	Russian Wildrye	Tom	8
	Fojtan Festulolium		20
	Orchard Grass	Killarney *(low germ)*	10
	Tall Fescue	Courtney	8
	Timothy	Grinstad	4
Legumes	**Alfalfa**	AC Grazeland	8
	Alfalfa	Dalton	8
	Alfalfa	20-10	8
	Alfalfa	Halo	8
	Alfalfa	Rangelander	8
	Alfalfa	Rugged	8
	Alfalfa	Spredor 4	8
	Alfalfa	Spredor 5	8
	Alfalfa	Yellowhead	8
	Alfalfa	PV Ultima	8
	Alfalfa	44-44,	8
	Sainfoin	AC Mountainview	30
	Sainfoin	Nova	30
	Cicer Milk Vetch	Veldt	13
	Cicer Milk Vetch	Oxley 2	13
Mixes	Mix 1	Fleet Meadow Brome	7
		Yellowhead Alfalfa	4
	Mix 2	Success Hybrid Brome	7
		Yellowhead Alfalfa	4
	Mix 3	AC Armada Meadow Br	7
		Yellowhead Alfalfa	4
	Mix 4	Fleet Meadow Brome	7
		Spredor 5 Alfalfa	4
	Mix 5	Success Hybrid Brome	7
		Spredor 5 Alfalfa	4
	Mix 6	AC Armada Meadow Brome	7
		Spredor 5 Alfalfa	4
	Mix 7	Fleet Meadow Brome	7
		AC Mountainview Sainfoin	15
	Mix 8	Success Hybrid Brome	7
		AC Mountainview Sainfoin	15
	Mix 9	AC Armada Meadow Brome	8
		AC Mountainview Sainfoin	15

Perennial Forage Variety Trial was partially funded by Alberta Beef Producers and Yellowhead County.

2016 WCFA activities

Pre-seed tillage and pre-burn herbicide was applied. Forage varieties were seeded on July 2016, with a small Fabro disc drill in 5 rows at 22.5 cm row spacing, (9 meters by 1.14 meters plot area). Soil moisture was good. 2016 was an extraordinary year with excessive amount of precipitation early in the season, then later in the year dry and hot. Grasshopper damage prevented data collection this year, see graphic 1. For weed control one application of Tropotox Plus at 1.72 lbs/acre on July 13th 2016 was applied, and then one light mowing later that month. Despite the effort to keep the plots clean of weeds, the excessive weed pressure prevented us from performing emergence counts. The legume plots were overtaken by the high weed pressure.

Perennial forage site at Wildwood, each flag indicated the beginning of each plot. July 2016



Graphic 1. – Month to month precipitation, Evansburg weather station, 2016 establishment year
Source: Alberta Climate Information Service (ACIS)

2017 WCFA activities

Plant counts were performed in June and plant height and maturity assessments were performed in July. Weed management at the site included mowing and hand weeding. Yield and quality samples were collected during the summer. Stand establishment was good for the perennial grasses and grass/legume mixes, despite pest and weed pressure and lack of moisture early in the summer.

Sickle mower next to plot and 2 flags that indicated the area that was cut, collected and weighted. Summer of 2017

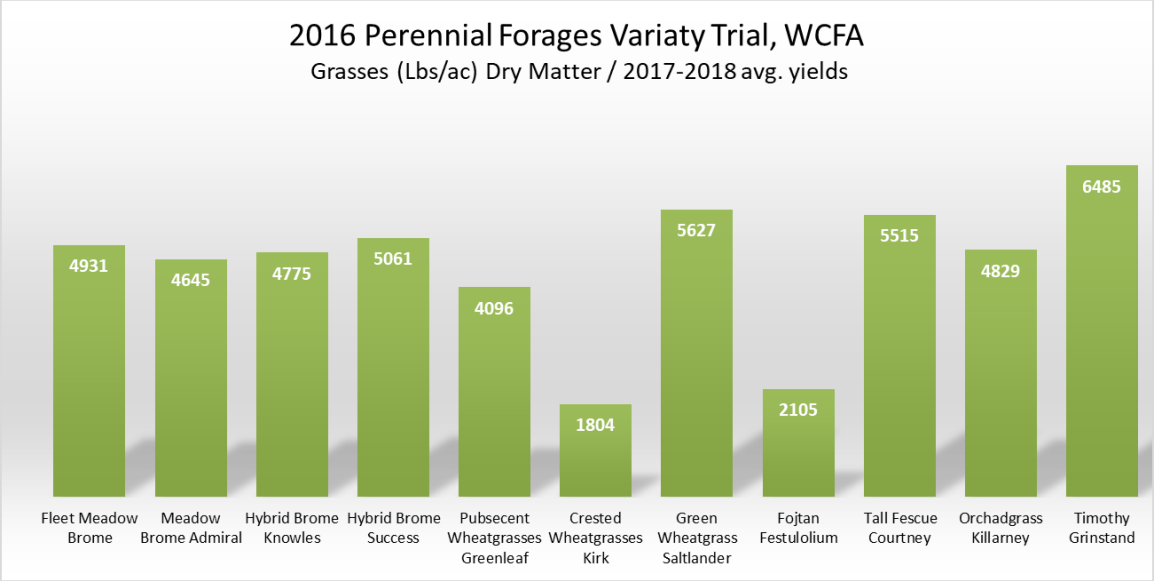
2018 WCFA activities

Plant counts took place in May, and height and maturity assessments in July. It is worth mentioning that sainfoin plants weren't found at the plots. Yield and quality samples were collected during the summer of perennial grasses and grass/legume mixes.

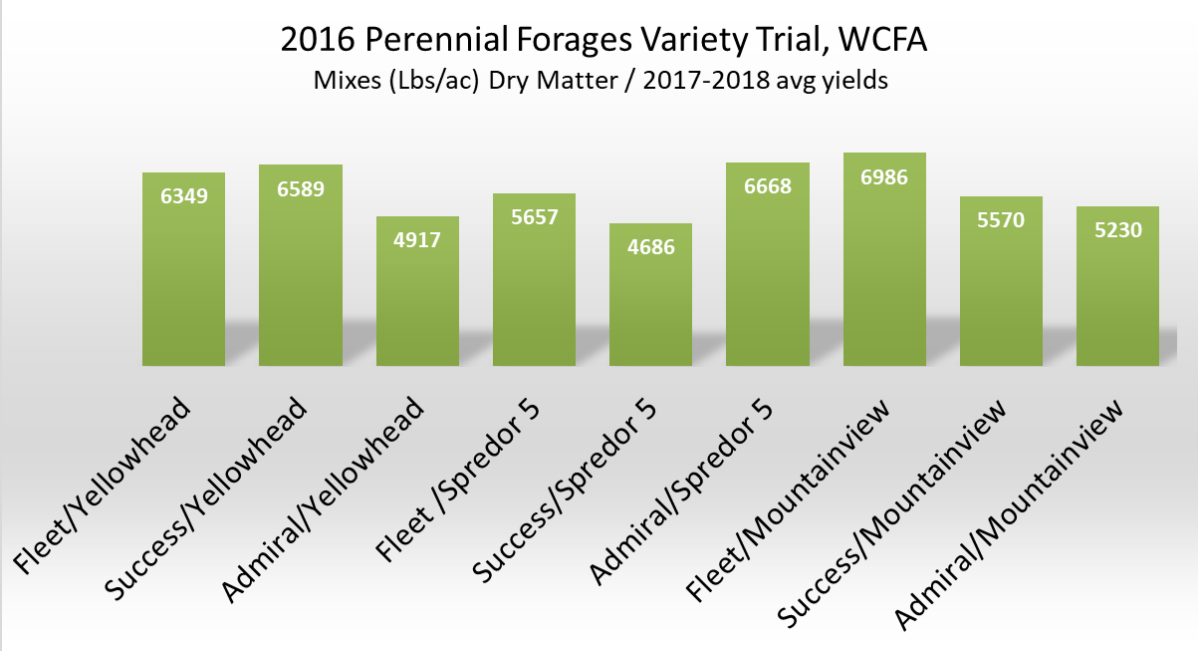
Dylan performing plant counts. Summer of 2018

Forage yield:

Timothy Grinstand was the highest yielding variety with 6,485 Lbs/ac of dry matter. The second highest was Green Wheatgrass Saltander with 5,600 pounds per acre of dry matter. However, the lowest was Crested Wheatgrass Kirk with 1,804 pounds per acre of dry matter. See graphic 3. For the Mixes (Grasses-Legumes) the highest yield was Fleet/Mountainview with 7,000. The second highest varieties were Fleet/Yellowhead, Success/Yellowhead and Admiral/Spredor 5 with over 6,300 each, and the lowest was Success/Spredor 5 with 5,000 pounds per acre of dry matter. See Graphic 4.



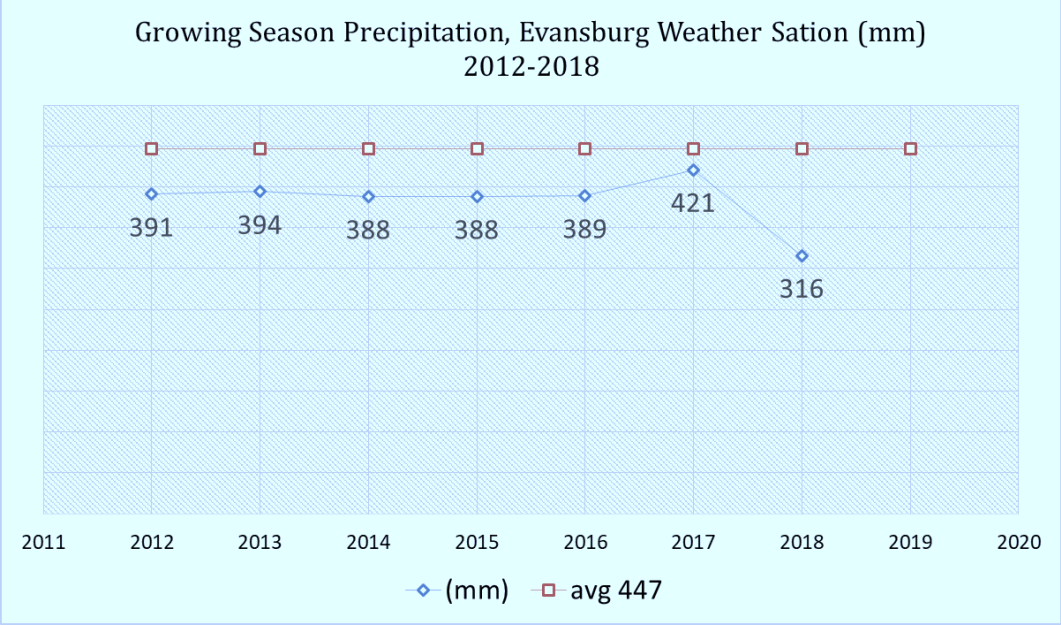
Graphic 3. – Average dry matter forage yield for various grasses from Wildwood AB, 2018



Graphic 4. – Average dry matter forage yield for various grass/legume mixtures from Wildwood AB, 2018

Environmental Conditions

Historical annual total precipitation of the gray wooded soil zone from 1971 to 2000 was 526mm on average and the growing season precipitation (May until October) is 447mm on average (Alberta Weather Data Viewer, 2016). Graphic 2 shows the accumulative precipitation for the growing season from the Evansburg weather station.



Graphic 2. – Growing season precipitation for Evansburg weather station from 2012 to 2018.
Source: Alberta Climate Information Service (ACIS)

From Left to Right. Rain gauge from June 2016, 2017 and 2018 at Wildwood