



Which forage varieties are the best options for hay or grazing in different regions of Alberta?

Perennial Forage Variety Evaluation and Demonstration at Multiple Sites in Alberta

Project No. FRG 19.15

Lead Researcher: Dianne Westerlund
(Chinook Applied Research Association)

Collaborators: Martina Alder (*Vicki Heidt*), Battle River Research Group (BRRG), Laura Gibney (*Jennifer Duckering*), Foothills Forage and Grazing Association (FFGA), Sandeep Nain, Gateway Research Association (GRO), Alyssa Krone, Lakeland Agricultural Research Association (LARA), Dr. Jacob Marfo, Mackenzie Applied Research Association (MARA), Nora Paulovich, North Peace Applied Research Association (NPARA), Dr. Akim Omokanye and Liisa Jeffries, Peace Country Beef and Forage Association (PCBFA), Dr. Kabal S. Gill, Smokey Applied Research and Demonstration Association (SARDA), Fito Zamudio, West Central Forage Association (WCFA), Barry Yaremicio, Beef Nutrition Specialist (Alberta Agriculture and Forestry).

Background: The majority of the annual feed requirement of Alberta's cow herd comes from perennial forages, including both grass and legume species. 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. Selection of high yielding varieties for hayland and pastures in different areas of the province can reduce production costs for Alberta's cattle ranchers.

Forage producers in Alberta have had limited access to information on new perennial crops in recent years. This project includes

evaluation of cultivars which were developed in recent years but have had limited regional testing beside varieties which are commonly grown in the province.

Objectives:

The species/variety trials targeted the following objectives:

1. To provide 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.

The demonstration component targeted the following objectives:

1. To demonstrate the regional adaptability of various forage species, varieties and mixes.

Study Procedure: A selection of perennial forages species and varieties were seeded into cereal stubble or chem fallow at the following sites in 2016: Barrhead, Evansburg, Fort Kent, Fort Vermilion, High Prairie, Manning, Sedalia and Sedgewick. Trial treatments were divided into 3 blocks: Grasses (12 entries), Legumes (15 entries) and Grass/Legume Mixes (9 entries). Four replications were planted within each block in a randomized complete

block design. A common source of seed was used for each entry. Strips of each treatment were also seeded near Cremona for demonstration purposes only. Similar protocols and appropriate agronomic practices were used at each site.

A number of parameters were monitored within each plot at all sites, including ease of establishment, height, botanical composition, dry matter weights and nutritional quality.

Target harvest stage for yield evaluation was early to mid-bloom for the legumes and flowering for the grasses. Harvest yield included the full plot growth clipped to a height of 7.5 cm using a forage harvester in 2017 and 2018. The entire plot area was harvested, weighed and a sub-sample was collected and dried to determine dry matter yield. Samples were submitted to A & L Labs for analysis of basic nutrients.

A partial economic analysis including establishment, seed, chemical and harvest costs and value of the forage, was calculated for each variety.

Sites were grouped by Alberta Ecoregions (*Alberta Agriculture & Forestry Agriculture Ecoregions in Alberta*) for data compilation purposes:

1. Mixed Grassland (Sedalia)
2. Aspen Parkland (Sedgewick)
3. Boreal Transition (Fort Kent, Barrhead and Evansburg)
4. Peace Lowland (Fort Vermilion, High Prairie and Manning)

What was learned:

Adverse conditions such as drought, flooding and/or weed pressure, during the establishment year have a large impact on strength of a forage stand, regardless of variety.

Highest yielding varieties for the Mixed Grassland region over the two years in

southern Alberta included Greenleaf pubescent wheatgrass and AC Success hybrid brome; Yellowhead and Rugged alfalfas and mixes of AC Success hybrid and Fleet meadow bromes with Yellowhead alfalfa. In the Boreal Transition region of central Alberta, AC Success hybrid brome, Rangelander and Yellowhead alfalfas and the AC Knowles/AC Mountainview sainfoin and the AC Success hybrid brome/Yellowhead alfalfa combinations were the top yielding entries. AC Saltlander green wheatgrass, Greenleaf pubescent wheatgrass and AC Admiral meadow brome were top yielding grasses in the Peace Lowland region. There was no significant difference amongst the legume entries in the Peace trials. Fleet meadow brome/Yellowhead alfalfa was the highest yielding grass/legume mix. Average yields at most sites were much less in 2018 versus 2017, most likely due to a cold, dry spring. Yields of the Fojtan Festulolium, Killarney orchard grass and Courtney tall fescue grasses dropped considerably at most sites between 2017 and 2018, indicating a lack of tolerance to winter and other weather stressors. The AC Mountainview sainfoin and the cicer milk vetch varieties do not appear to persist as well as the majority of the alfalfas.

As expected, the leading varieties based on potential economic return typically align with the ranking of yield during the first two years of production. Cost of seed also impacts the economic return.

This project was also supported by the Alberta Agriculture and Forestry (formerly Alberta Livestock and Meat Agency (ALMA)).

