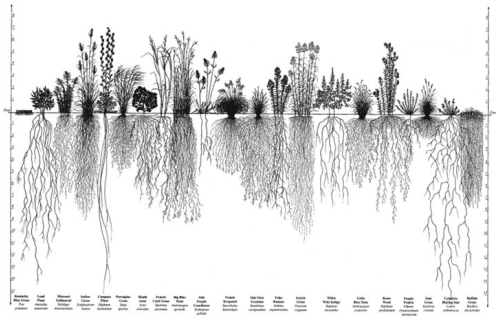
HIGH LEGUME PASTURES

Advantages of High Legume Pastures



Root Systems of Native Plants

Higher quality and quantity of forage over the grazing season.

- Increased profit per acre.
- Increased production from each acre.
- Increased gain per acre per animal.
- Improved cow condition and conception rates.
- Extends the grazing season, and helps manage the summer slump.

Builds soil quality, and is a source of Nitrogen for the pasture. (The highest potential happens when the seed has been inoculated with the correct bacteria).

- Nitrogen that is fixed is a symbiotic bacterial process, and root nodules are formed.
- Fixed Nitrogen is available to other forage plants through legume root cell leakage or fecal transfer.

Biodiversity of organisms above and below ground.

- Legumes with grasses bring more diversity of functional traits, and access various depths in the soil profile to capture and transfer moisture, nutrients, and enhance plant/soil/organism ecological systems.
- A healthy pasture has increased soil organism activity, insects, birds, and wildlife.

Greater stability of yield during drought.

Carbon sequestration can be improved with legumes added to grasses, and increased management.

Increased possibility for family succession on the same land area.

"The fear of bloat costs the livestock industry far more than bloat itself"

- Jim Gerrish

Alfalfa

Sainfoin

Red Clover

Alsike Clover

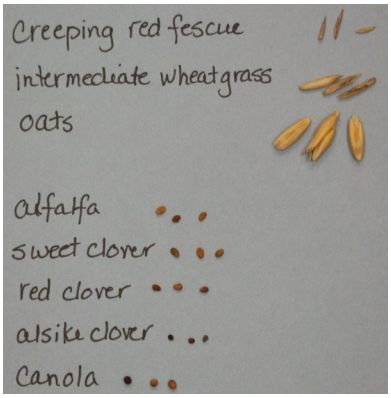
Growing Forward 2
A federal-provincial-territorial initiative

Alberta Government

Canada

Precision seeding will ensure the seeds are placed at the correct depth, and allow for most effective soil to seed contact.

Consider the average forage seed size…



BE PREPARED

Seedbed preparation and firmness prior to seeding is critical to a successful forage establishment. Forage seed cost is not cheap, nor is taking a forage stand out of production and then putting it back. Management to ensure germination is important so that reseeding is not necessary.

Weeds

Control the weeds before you seed, especially if you are using a mixture of grasses and legumes. Make sure there have been no residual herbicides used in the past that will affect your new crop. Watch closely throughout the growing season to ensure weeds are not choking out the forage seedlings as they try to establish.

Seedbed Firmness

If land is tilled prior to seeding, the seedbed should be firm enough PRIOR to seeding so that a footprint in the soil will be no deeper than 0.65 cm. Firm soil will allow uniform, shallow coverage of the seed and prevent it from drying out. A seed bed can never be too firm before seeding. A seedbed that is not firm enough is often the reason for a stand's failure to establish.

Inoculation of Legumes

Legumes require inoculation with specific rhizobia bacteria to more greatly fix nitrogen from the atmosphere. Ensure the inoculant or pre-inoculated seed has not expired, is specific to the seed being sown, and is stored in a cool place out of sunlight prior to use.

Timing of Seeding

Depending on the emergence of weeds, spring seeding can be an effective time to seed forages. Soil temperature for germination ranges from 5°C to 20°C.

Late summer seeding is best suited to irrigation land. Timing must ensure that there is sufficient root development before freeze up so 6 to 8 weeks of growth (3+ leaf stage) is usually required.

Very late fall seeding can also work. It is important that the soil temperature is below 2°C so that germination will not occur until the following spring.

Seed Placement

Seed placement is determined by seedbed firmness, seed size, soil texture, and moisture conditions. As shown above, seed size varies.

Typically forage seed size is quite a bit smaller than most cereal grains, or even canola, so shallow placement is crucial. Smaller seeds do not have the energy to emerge from a deep planting, and is often the reason for establishment failures.

Once the seeds have germinated, it is crucial to monitor the stand throughout the growing season to ensure the young forage seedlings are not stressed by plant competition for moisture, nutrients, or most importantly lack of sunlight.

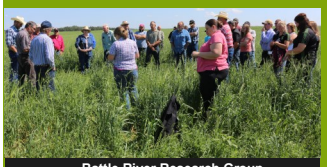
Forage and Research Association Field Days 2016

Thank you to the forage/research associations for their part in planning and hosting the High Legume Field Days during July/August 2016.

There are 14 high legume pasture sites being established across the province. 2016 was year one of this *Growing Forward 2 (GF2)* two year project. The main emphasis of year one was the establishment of the high legume pasture sites.

The producer/cooperators were on hand at their site for the local field day to provide first hand experiences of seeding and monitoring the stand to date. Some had challenges with seeding depth and germination. Weed control also proved to be a concern to some. Thankfully rain arrived province wide by the end of June, and the forage stands look promising for grazing in 2017.

A huge thank you is extended to the producer mentors who attended the various field days to provide their input on high legume pastures. Learning from those who have "been there, done that, and got the T-shirt" is always appreciated!



Battle River Research Group
August 2

North Peace Applied Research Association
August 25

Gateway Research Organization
August 16

Chinook Applied Research Association
August 18

Foothills Forage & Grazing Association
August 24

Stand Establishment as of August 24, 2016—Longview. Seeded June 6, 2016. Grazed lightly/quickly July for weed control.

Keep An Eye on the Stand

While the prospect of establishing a pasture was looking bleak the early part of June 2016 in Alberta, province wide moisture throughout the summer has changed everyone's perspectives.

Once the seeds have germinated, it is just as crucial to monitor the stand throughout the growing season to ensure the young forage seedlings are not too stressed by plant competition for moisture, nutrients, or most importantly—sunlight. Monitor for weeds, insects, and leaf diseases. Refer to the Alberta Forage Manual (pages 247-330) for more information on forage insects and pests.

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/agdex16/$FILE/120_20-1_2009.pdf

Patience is a virtue when it comes to establishing forages. Depending on the year, it will take some time to get a firm establishment of the forage stand. It is important to continue to keep an eye on the site to know when issues arise. If the seedlings have started, and then die off due to a cut worm infestation, or lack of sun/moisture, then it will be important to know, and reseed as necessary. If the seeds have not germinated because of lack of moisture, the seeds are still there, and when the rains resume, forage growth should follow.

Successful Establishment of High Legume with Grass Pasture

Economically Viable Yield	Fair	Poor
3-5 plants/ft^2 	2 plants/ft^2 	1 plant/ft^2 

Divide plant count 1/4m^2 by 2.7 to get plants/ft^2

Frequently Asked Questions...

What is the *Growing Forward 2* funded High Legume Pasture project all about?

The High Legume Pasture project is a continuation from previous team projects on extending the grazing season, and thereafter small plot trials with new sainfoin genetics. The basis of all this leadership came with key grazer cooperators who depended on high yielding and animal performing, soil enhancing pastures to "put a haystack on a cow's back". (Comment-Dick Diven).

Ten forage/research associations got onboard with this new project, found producers willing to establish, and in year two, graze the high legume pasture. It was based on thinking, "If you were seeding an ideal pasture? What would that look like? If you were managing that pasture to be the best pasture, what would that look like?" (Comments-Doug Wray, Rancher, Forage leader and Grazing mentor, Irricana). The high legume pasture project addresses the goal of a high performing, more stable yielding (even in drought) longer active growing season (summer slump and later into fall), higher profit, and higher soil health/carbon capture pasture.

When the new sainfoin variety, AC Mountainview was bred by Dr. Surya Acharya at Agriculture and Agri-Food Canada, Lethbridge, Dr. Acharya wanted to give the grazers what they were asking for. This is a non-bloating, hardy, higher yielding legume that can regrow at a rate equal to alfalfa.

This *Growing Forward 2* funded project follows through on taking Dr. Acharya's research to the forage industry. Alberta Agriculture and Forestry, the Agricultural Research and Extension Council of Alberta, forage and applied research associations, producer cooperators, and several experienced high legume grazing mentors make up this team who are taking "science to practice" for testing, demonstration, discussion, learning, and consideration.

There are 13 ten acre sites establishing in 2016 and 2017, all across Alberta and into the Peace Region of British Columbia. They were each seeded to a mixture of AC Mountainview (20%), alfalfa (40%), and grass (40%) for grazing in 2017. Field days and seminars started in the summer of 2016 and will continue throughout the project. These are opportunities to see local/regional results, and to have discussions with fellow grazers who are considering this higher legume pastures, plus discuss with those already doing it with success for many years.

Although this project focusses on AC Mountainview sainfoin and alfalfa, there are several other legumes that may be good options or can be used in combination such as: newer cicer milkvetches, Birdsfoot Trefoil, Yellow Blossomed alfalfa, clovers (Alsike, Red, Kura, Sweet, Purple Prairie).

How can I get involved?

On the back page of this publication, find the association nearest you, or the one that fits your goals, and contact them. Ask questions, go to information events and field days. The associations will be happy to assist you from there.

These high legume pastures sound good, but what about the risk of bloat?

With the introduction of AC Mountainview Sainfoin into the pasture mix, the risk of bloat decreases. Sainfoin contains tannins that bind with the soluble proteins and inhibit the activity of rumen microbes; thus slowing the rate of digestion of the forages. A rapid rate of forage digestion has been determined to be a major cause of bloat.

By managing the pasture to ensure the sainfoin remains, animals will consume the tannins from the sainfoin and therefore reduce the chances of a bloat incident. The grass also present in the pasture give another non-bloat grazing forage that when consumed will reduce the amount of alfalfa consumed, and therefore also reduce potential for animal bloat.

Further tips, factsheets, and research papers containing higher legume pastures benefits and bloat information are housed on the "made in Canada for forage and beef producers" website: www.foragebeef.ca

Bloat in Pastures - http://www1.foragebeef.ca/$foragebeef/frgebeef.nsf/all/ccf126

Grazing Legumes - http://www1.foragebeef.ca/$foragebeef/frgebeef.nsf/all/frg38

Dale Kaliel and now Anatoliy Oginskyy did an analysis of fellow Alberta beef producers economics of grazing different types of pastures. It is on Ropin' the Web at: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/econ14302

Newer pasture comparison data up to 2015 should be soon added to this site.

Sounds like a lot of work!

Managing the pasture stand over the growing season does require setting up, observation, and planning. With an effective plan that manages the forage based on environmental conditions and the farm operation, the "work" is much more observation based, and moving cattle than the physical feeding of the animals.

By managing the pasture in the summer to be as productive as possible, the livestock herd will have the best chance of increasing their body condition score during the growing season. By going into the winter months with a higher body condition score, they are carrying a hay stack on their backs, and can be fed less to reduce winter feeding costs while still maintaining an adequate plain of nutrition.

It is a change in mind set, so consider this...why not spend your time in the summer managing the forages and cow herd, and work towards a winter feeding system where the livestock do more of the work for you? Not having to start a tractor every day significantly cuts down on feeding costs, and allows you to keep more money in your pocket. Limit swath or corn grazing (using an electric fence to reduce the size of the feeding area) is a terrific way to put your cows to work. The key to swath or corn grazing is not allowing the cows to selectively graze for a long period of time so that their plain of nutrition decreases. Mineral supplementation is also important to ensure the cows receive the required CA:P ration. "It is a 365 day nutritional system with a grazing mentality." (Dale Engstrom and Gerry Taillieu)

Where can I get more information?

Check out the back page for the association nearest you.

In addition, there are a number of other places to find more information on grazing high legumes and other related topics.

ForageBeef.ca Ropin the Web

Feeding Legumes to Cattle: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6516

Body Condition: Implications for Managing Beef Cows: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3450

BCRC's Body Condition Scoring: http://www.beefresearch.ca/research/body-condition-scoring.cfm?utm_source=bodyconditionscoring.ca&utm_medium=redirect&utm_campaign=Body%20Condition%20Scoring

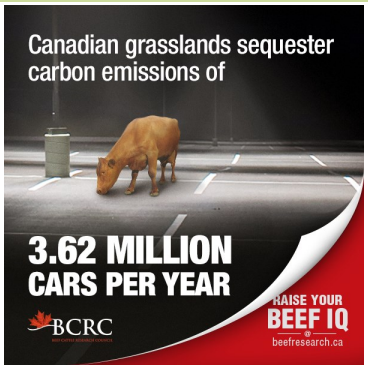
Winter Feeding Programs for Beef Cows and Calves: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex8908

Bloat in Cattle: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex6769

ALBERTA RANCHERS WINTER GRAZING CATTLE VIDEO SERIES

https://www.youtube.com/playlist?list=PLOUwfF01x2YVXr2cBui0KgskBRwZsKwMr

This series of 47 videos shares the personal perspectives and management practices of ranchers from across Alberta discussing their different winter grazing systems.



Keys to Successful Forage Stand Establishment

1) **Carefully choose the grass and legume species/varieties** that will work for your conditions. If the area you are seeding is prone to spring flooding, ensure there is at least one or two varieties in the mix that will tolerate those conditions. The same goes for pH and salinity.

2) **Seedbed preparation** cannot be emphasized enough. Prior to seeding, the seedbed needs to be firm to obtain maximum germination of the forage seeds. If broadcasting is your choice of seeding, the seeding rate should be increased 1.5 times. Weed control prior to seeding and then again during establishment is critical.

3) Although we do not have control of the weather, we can get a good idea of the weather patterns. **Adequate soil moisture** throughout the first year's growth of the seedlings will be important for establishment.

Forage & Research Associations Information about High Legume Pastures

Organization	Headquarters	Website Address	Phone Number
ARECA Agricultural Research & Extension Council of Alberta	Leduc	http://www.areca.ab.ca	780.612.9712
BRRG Battle River Research Group	Forestburg	http://www.battleriverresearch.com/	780.582.7308
CARA Chinook Applied Research Association	Oyen	http://chinookappliedresearch.ca/	403.664.3777
Farming Smarter	Lethbridge	http://www.farmingsmarter.com/	403.381.5118
FFGA Foothills Forage and Grazing Association	Okotoks	http://www.foothillsforage.com/	403.995.9466
GRO Gateway Research Organization	Westlock	http://gatewayresearchorganization.com/	780.349.4546
GWFA Grey Wooded Forage Association	Rocky Mountain House	http://www.greywoodedforageassociation.com/	403.844.2645
LARA Lakeland Agricultural Research Association	Fort Kent	http://www.laraonline.ca/	780.826.7260
MARA Mackenzie Applied Research Association	Fort Vermilion	https://www.mackenzieresearch.ca/	780.927.3776
NPARA North Peace Applied Research Association	Manning	http://npara.ca/	780.836.3354
PCBFA Peace Country Beef & Forage Association	High Prairie	http://peacecountrybeef.ca/	780.523.4033
PRFA - BC Peace River Forage Association of British Columbia	Dawson Creek	http://www.peaceforage.bc.ca/	250-789-6885
WCFA West-Central Forage Association	Entwistle	http://www.westcentralforage.com/	780.727.4447
Ag Info Centre AB Agriculture and Forestry	Stettler	http://www.agriculture.alberta.ca/	310.3276 or 403.742.7901

Cicer Milkvetch | Birdsfoot Trefoil | Kura Clover | Yellow Alfalfa