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Native verses introduced plant species: which one should I consider for my next pasture expansion?

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The relative merit of native versus introduced plant species for use in rangeland has been a controversial area for producers, researchers and academics. Research studies done in the eighties suggested that native grasses were difficult to establish and had poor productivity compared to introduced grasses. Those conclusions were then extrapolated to all native species relative to introduced grasses for the semiarid region of Western Canada. Unfortunately those earlier research studies were flawed and 90% of the variation in forage production among native and introduced species could be explained by variation in stand establishment. Research has suggested that higher productivity in some stands of seeded introduced species relative to native species is due to site modification by tillage, and not to any, inherent superiority of introduced over native species. Current demonstrations and continuing research projects have successfully established various native grass, legume, shrub and forb species in the southern portions of Saskatchewan.

A recent research study jointly funded by Saskatchewan Agriculture Development Fund, Federal Matching Investment Initiative and seven collaborative partners (cash and in-kind funding) successfully initiated a project to reestablish a mixed native grassland in southwest Saskatchewan. The study consisted of seeding two different native seed mixtures (simple or early successional grass species and a complex of more diverse grass, forb and shrub native mixture) and evaluating forage and grazing potential. Although year 2001 was considered a drought year and ranked as the 2nd driest year on record behind 1937, soil moisture was sufficient for seed germination and to establish a successful native stand. However, proper pre- and post-seeding weed control was critical for native plant establishment, especially in a year where precipitation was limited and any excessive weed competition for moisture and nutrients would have resulted in substandard native establishment. The literature is filled with numerous reports showing the ability of native species to withstand extreme environmental conditions that would kill other non-native plants. Results from 2002 for forage production and grazing performance ranged from 1500 to 2500 lbs per acre (harvested in July) and average daily gains for steers grazing in July and August ranging from 1.6 to 2.2 lbs per day. The successful establishment of the native seed mixtures and the good moisture received in 2002 greatly contributed to the excellent animal performances and forage production. These results are preliminary and additional results and data will be collected till 2005.

The native establishment research study is multi-facet and a number of other areas will also be evaluated, such as:

Longevity - part of the potential benefit of different seed mixture is their performance over the long haul. Evaluating their performance over time helps to determine the cost amortization and the comparison to more traditional pasture mixtures.

Agronomic strategies – determining strategies on how to best establish native seed mixtures and when to seed in the semiarid brown soil zone area to achieve successful establishment.

Carbon Sequestration – the ability to act as a Carbon Sink is a new opportunity for these old species. Our global desire to control greenhouse gas emissions may be aided by the use of native species. Because natives have significant biomass production below ground, they may act as a good mechanism to remove the Carbon from our atmosphere.

Grazing potential of cicer milkvetch and sainfoin: two non-bloating perennial legumes.

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Alfalfa (*Medicago sativa* L.) is the oldest known domesticated forage and historically has been used for more than 3,300 years. The potential benefits of grazing alfalfa are well-documented (high yields and excellent forage quality) and thus many livestock producers are interested in its use. However, proper grazing management and bloat prevention are two of the challenges when grazing alfalfa. Various strategies have been attempted to minimize potential bloat concerns, such as: pasture management and diet manipulation (alfalfa/grass mixture, a stage of maturity etc.), anti-bloating and feed additive compounds (detergents, monensin, etc.), bloat reduced alfalfa cultivar (AC-Grazeland) and non-bloating legumes (cicer milkvetch etc.). The use of alfalfa/grass mixtures has been the most practical bloat prevention measure for beef cattle production in Western Canada but may not always be effective.

Cicer milkvetch (CMV) (*Astragalus cicer* L.) is adapted for use on rangeland, pasture and disturbed land in the Dark Brown and Black soil zones. It is a long-lived, perennial, herbaceous legume with a vigorous, rhizomatous root system and its stems are hollow and succulent. Cicer milkvetch starts growing about three weeks later in the spring than alfalfa and grows best during the summer. At Swift Current, CMV has been successfully established in a mixture with grasses and it has better winter-hardiness than alfalfa throughout Western Canada. In addition, CMV is moderately saline tolerant and drought resistant. Seedling emergence and growth of CMV are slower than that of alfalfa and sainfoin. Cicer milkvetch does not cause bloating and its nutritive value compares favorably with alfalfa as it provides a very nutritious forage late in the grazing season (Table 1).

Sainfoin (*Onobrychis viciifolia* Scop.) is best adapted on Brown, Dark Brown and Black soil zones. Sainfoin has the reputation of being drought-resistant, but yields are generally less than alfalfa on Brown soils. It is a short to medium-lived, perennial, develops a deep branched taproot and hollow stems. Sainfoin begins to grow in the spring before other perennial legumes and starts blooming as much as two weeks before alfalfa. At Swift Current, a sainfoin + alfalfa mixture has been successfully established and it has been found to be less winter-hardiness than alfalfa throughout Western Canada. Sainfoin is sensitive to salinity, spring flooding and water logged

soil conditions. Sainfoin does not cause bloating, compares favorably with alfalfa nutritionally and does not decline as rapidly with maturity as other forages (Table 1).

Because alfalfa is considered the "queen of the forage crops" substantial research effort has been directed toward reducing its bloat potential through breeding selection or mixing with non-bloating species. Alfalfa + sainfoin mixtures (70-80/30-20%) have been reported to provided good bloat protection and research has attempted to also mix alfalfa with CMV. However, alfalfa + sainfoin mixtures have been short lived, lasting as little as two years in some alfalfa or grass mixtures. Whereas, a number of weaknesses have limited the use of CMV, due to a high level of dormancy caused by a hard seed coat. Recently, scientists have dramatically improved yield potential and vigor problems of CMV with a new variety, AC Oxley II. Therefore, this neglected legume may have renewed potential, especially for grazing.
Additional research is needed to determine the best grazing management strategies to optimize the use of alfalfa + grass mixtures and non-bloating legumes. Research is currently starting at AAFC-SPARC to graze non-bloating legumes as monocultures instead of alfalfa + non-bloating mixtures. It is recognized that grazing management for the non-bloating legumes are quite different from alfalfa which is the only factor we often consider. Due to this the agronomic and grazing potential of non-bloating legumes may be hindered and less than optimal. The imbalance of seasonal growth of sainfoin (early spring) and CMV (summer) will require changes in grazing management. Grazing sainfoin in spring-early summer followed by an alfalfa + grass mixture and then CMV for late summer-early fall grazing could provide more uniform and optimal forage production throughout the entire grazing season. In 2004, grazing studies are planned for grazing monocultures of sainfoin and cicer milkvetch and an alfalfa (Spreador IV) and a hybrid bromegrass (AC-Knowles) mixture at different stocking rates and forage utilizations and season of growth.

Table 1. Mean nurtitive value, forage yields and animal performance of alfalfa, cicer milkvetch and sainfoin forages.

Species	Forage characteristics[2]				Animal performance			
	CP%	DMD%	NDF%	Yield[1]	ADG[2]		Bloating	
					C	S	C	S
Alfalfa	14-22	60-65	40-55				+	+
Cicer milkvetch	14-21	61-65	35-37	20-30%< or =	=	=	none	
Sainfoin	15-19	60-64	30-32	20-15%<,= or >	=	=	none	

[1]Compare to average alfalfa forage yields.
[2]Crude protein (CP), dry matter disappearance (DMD), neutral detergent fibre (NDF), average daily gain (ADG), C = cattle and S = sheep, symptoms occurred (+), = to alfalfa, < less than alfalfa and > greater than alfalfa

SHOULD I BE CREEP FEEDING MY CALVES?

Lyle McNichol, Regional Livestock Specialist

This year dry conditions in Northwest area has many producers considering creep feeding their calves. It should be approached with budget analysis to determine potential advantages and

disadvantages. The potential uncertainty of fall calf prices requires careful consideration before creep feeding.

Creep feeding can be defined as the practice of providing supplemental feed to calves before weaning. The feed is provided in a facility designed so that adult animals are unable to consume the creep feed. By providing creep feed it is possible to increase preweaning weight gains and weaning weights. However, the selling price of the calves and the cost of feed must be considered when a producer is making his decision about creep feeding.

Creep feeding has many advantages, but there are also disadvantages which must be considered by the livestock producer. Manitoba Agriculture and Food has a creep feed calculator budgeting program available.

EFFECT ON CALF GROWTH

The extra weight gained as a result of creep feeding is variable. Factors affecting the response are supply and quality of pasture or range, milk production of the dams, growth potential of calves, sex of calves, age of calf at weaning, type of feed, length of creep feeding period, distance travelled to creep feeder and season of birth of calf. Depending on these variables creep fed calves can be expected to gain from 2 - 45 kg (5 to 100 lb) more before weaning than non-creep fed calves. Under most pasture conditions, the average increase in weaning weight is 18 kg (40 lb) with a range from 10 - 27 kg (25 to 60 lb).

Calves sucking good milking dams on good pasture will gain little creep feeding, but if milk and/or pasture are poor, weaning weights can be substantially improved by creep feeding. The cows' milk production decreases in later summer and fall as does available pasture and quality. Thus the gap between the calves' nutrient requirements and the amount of nutrients supplied by milk and pasture tends to increase.

PASTURE AND FEED CONVERSION EFFICIENCY

When calves are on creep feed, they tend to substitute creep feed for forage in their diet. Thus, creep feeding can allow increased pasture stocking rates. It is estimated that each kg (lb) of creep feed consumed will save 0.5 to 1.0 kg (0.5 to 1.0 lb) of forage dry matter. Therefore, if a calf consumers 90 kg (200 lb) of creep feeding throughout the summer, a saving of about 68 kg (150 lb) of forage dry matter would result. Since creep feeds have a higher energy value than forages, a substitution of creep feed for forage dry matter will result in an increased energy intake and a subsequent increase in weight gain by the calf.

CREEP FEEDING AND PRECONDITIONING

Late summer creep feeding is beneficial as part of a preconditioning program. If calves have had access to creep for several weeks before weaning they will have become accustomed to eating grain. Calves that are accustomed to creep feed can be weaned with less stress, are easier to start on feed and regain weaning and shipping losses more quickly.

POST WEANING PEFORMANCE

Some of the disadvantages of creep feeding will be evident after weaning if the calves have received too much creep feed. The extra finish acquired by many calves can result in slower and costlier gain during the subsequent feeding period.

Replacement heifers in extra fat condition at weaning may later perform poorly in the cow herd.

Replacement heifers should only be creep fed to promote skeletal development and subsequent normal sexual development. This will only be necessary under poor pasture conditions or if the cows are poor milkers.

THE CREEP RATION

Locally available grain are good energy sources for creep rations. Oats is the preferred grain in creep rations because of its bulk and energy concentration relative to other grains. The high price of oats recently has producers and feed companies looking at alternative grain sources.

Calves intended for breeding stock should receive creep rations containing at least 50 per cent oats. This will help to keep the calves from getting too fat.

The palatability of creep rations is enhanced by using combinations of two or more grains or the additional bran, molasses and/or trace mineralized salt.

The creep ration should contain 2.9 - 3.1 Mcal/kg digestible energy, 13 - 16 per cent crude protein, 0.7 per cent calcium and 0.5 per cent phosphorous, trace mineral salt and Vitamin A, D, and E.

Example Creep Ration Using Either a Commercial 32% Protein Supplement or Canola Meal

	CRUDE PROTEIN CONTENT *13%*		**CRUDE PROTEIN CONTENT** *16%*	
Oats	27.0	27.0	23.0	23.0
Barley	63.0	61.6	53.0	53.2
32% Supplement	10.0	--	24.0	--
Canola meal	--	9.1	--	22.0
2:1 mineral	--	0.6	--	--
Limestone	--	1.2	--	1.3
Trace mineral salt	--	0.4	--	0.4
Vita. ADE premix	--	0.1	--	0.1
	100.0	100.0	100.0	100.0

Some good sources of supplemental protein for creep rations are soybean meal, canola meal, commercial protein supplements (urea free) and dehydrated alfalfa pellets.

Many feed companies offer a variety of good quality commercial creep rations in several price ranges and which can be medicated if required.

WHEN TO CREEP FEED

Creep feeding may be economically advantageous if one or more of the following situations exist:

- During periods of drought, when pastures are poor or when milk production of cows is lowered
- Two-year old heifers and low producing cows and their calves can be separated from the main herd
- As part of a forage management program to conserve pasture
- Increase the pasture stocking rate
- Calves are fall born
- As part of the precondition program creep feeding 2 to 3 weeks before weaning will help accustom calves to dry feed
- Prices for weaned calves are high and feed grain prices are low
- The market demands calves to be in extra good flesh
- Calves will be slaughtered immediately after weaning
- Late calves are being pushed for a set market date
- Feeding potential replacement heifers from low milk producers in order to get calves to reach puberty by 13 to 15 months of age
- For large cross-bred calves from low milk producing cows

BodyConditionScoring

Heather Froebe, Eastern Livestock Specialist, MAF

Body condition scoring (BCS) is a subjective, "hands on" method for determining the amount of fat an animal is carrying. We use this term at our meetings, but we often find that a hands on approach is necessary to fully understand it. So, in April, we had a hands on body condition scoring clinic for staff members in the Eastern/Interlake region. At this clinic, we talked about how to condition score, the relationship between body condition score and postcalving fertility, feeding strategies in relationship to condition score and the practical application of it all. Then we got out there and tested our skills on the cattle.

We started off with this hands on approach because thick hair coats in cattle can often fool visual evaluation, causing cows to appear in better condition than they really are. We use this scoring system to have a universal method of categorizing cattle, based on the feel of your cows. We use the more common 1 (thin) to 5 (fat) scale and the table shows a description, as well as a conversion into the 1 to 9 scale. The main point on the cow that is used to assess condition is the area we call the short ribs, between the last long rib and the hipbones. Just place your hand on

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the ends of these short ribs and feel. The area around the tailhead is also used to assess fat cover.

US	CAN	
1	1	Emaciated – extremely emaciated and listless
2	1.5	Very thin – appears somewhat emaciated
3	2	Thin – can see individual ribs
4	2.5	Borderline – individual ribs not obvious
5	3	Moderate – can fell fat cover over ribs and tail head
6	3.5	Good –pressure required to feel shortribs
7	4	Very good – some fat in brisket, feels spongy over ribs
8	4.5	Fat – very fleshy, brisket full, cannot feel shortribs
9	5	Very fat -extremely fleshy and blocky

The amount of fat that the cow is carrying, or BCS, is directly related to reproduction. If the cow is in a poor state of nutrition and is thin, when it comes time to rebreed, the hormone system in the cow says no, and the cow does not cycle.

Cows entering the winter feeding period in poor body condition require more energy to maintain condition, and if they calve out in poor condition, other factors such as poor quality colostrum, poorer calf survival rates, and difficult rebreeding begin to surface. First calf heifers may be even more adversely affected, as they must be fed to grow at the same time that they are nursing their calves. These factors will all result in loss of income.

Good BCS targets for cows and heifers:

1) At pregnancy checking or the start of the winter feeding program
    - target a min. of 3.0 for mature cows and first calf heifers
2) At calving
    - optimum BCS for mature cows 3.0
    - optimum BCS for first calf heifers 3.0-3.5
3) One month prior to breeding season
    - target a minimum of 2.5 for mature cows and first calf heifers

Practical application:

It is more important to know what a 2.5 and 3.0 score looks like than to know the whole scale. It is also better to improve BCS when dietary energy is least expensive (usually the summer). Ration balancing should take into account BCS.

For further info, see the fact sheet "Body Condition Score: Managing Beef Cows" http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3450?opendocument

*Stay tuned for a new MAF fact sheet on BCS coming out later this year!

Highlights from Beef and Forage Days

Written by: Val Ominski

The Manitoba Forage Council, in conjunction with a number of government and industry sponsors, assisted with Beef and Forage Days this past winter at Holland, Eriksdale, Ste. Rose du Lac, Rosa, Teulon, Birtle and Rivers. Our major sponsor for Beef and Forage Days 2003 was the Manitoba Rural Adaptation Council (MRAC); funds were provided through Agriculture and Agrifood Canada's Canadian Adaptation and Rural Development (CARD) program.

Following is a sampling of what producers heard at these informative events.

Environmental Scientist Speaks Out

Dr. Jay Lehr, science director for the Heartland Institute, an independent, non-profit research centre in Chicago, gave his analysis of U.S. concerns over soil, water and air quality.

As a very early environmental scientist and a leading authority on groundwater hydrology, he said that many of the past problems of water, air, water, and soil contamination in the U.S. have been fixed. However, individuals and groups with hidden agendas are using environmental concerns to their advantage – and the media is buying the bad news scenarios because they sell.

Dr. Lehr noted that a list of environmental myths include the impact of global warming, pesticides, fertilizers, nitrates, and ozone holes – to name just a few. He did, however, indicate that anything and everything can become dangerous at high concentration levels – but these levels are not properly researched and calculated by the U.S. government and activists.

Researcher Shares BVD Vaccination Info

Dr. Doug Myers, a veterinarian and researcher with Boehringer Ingelheim Vetmedica in Alberta, said bovine viral diarrhea (BVD), traditionally thought of as a feedlot disease, is actually very common in cow-calf herds – up to 80 per cent of cattle over a year old that were tested in a Western College of Veterinary Medicine study had BVD antibodies.

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Traditional vaccination programs are basically ineffective, he said, because the so-called “killed” vaccines used offer poor protection and are administered in the fall – which is the wrong time. He advised that young heifers should receive a “live" vaccine against Type1 and Type 2 BVD once they are weaned, and again pre-breeding. For maximum protection, he advised vaccinating the entire herd – including bulls – three weeks prior to breeding each year.

He told producers to pay particular attention to replacement heifers by quarantining and testing them prior to exposure to the rest of the herd, and by giving them two live vaccine doses prior to breeding.

Forage Specialist Promotes Grazing Plan

Don Green, former forage specialist with Manitoba Agriculture and Food – and now a full-time producer – told participants that a grazing system is like cash in their pockets because it will increase profitability and improve their land base – and its value. A good grazing system will provide rest for the grass, uniform grazing pressure (stock density), healthy plants and soil, and stable production levels, he said.

He advised following five steps to develop a good grazing management plan:

- One: Assess resources during the winter.
- Two: Determine objectives – also during the winter.
- Three: Prepare a grazing plan prior to spring.
- Four: Implement the plan – and make it work by adapting to the season if necessary.
- Five: Assess and amend where necessary.

He stressed controlled grazing through a rotational grazing system as the best way to get more cattle from less pasture. Rotational grazing will prevent overgrazing of select grasses and passing over of less-desirable plants.

Analyst Reviews Beef Markets

Debbie McMillin, a market analyst with Canfax in Calgary, took a long look at the beef industry, both past and present.

She pointed out that decreased consumer demand for beef has caused a drop from 55 per cent of market share in 1976 to 35.5 per cent in 2001, and this is a major factor in changing the industry. Giving consumers – and retailers – what they want is critical, she said, and measuring characteristics such as tenderness is important so processors and retailers can guarantee consistency to their customers.

Recent short feed supplies have been hard on the feeder cattle market, but she predicted that prices will recover in 2003, depending on feed and grain prices. Even though cattle numbers were revised upward for 2003, they were still down one per cent from last year, and the calf crop will still be at reduced levels for 2003, she said.

The issues that could affect the industry this year are feedlot equity, feed costs, world economies, animal health, consumer demand and international trade, Ms. McMillin predicted.