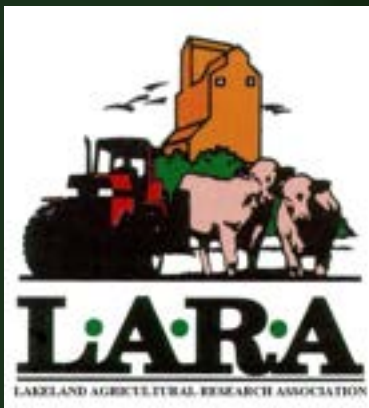


Grow With Us

2024, Issue 1

January/February 2024



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Exploring Corn Intercropping Strategies to Increase Protein and Profitability of Beef Cattle Grazing

by Beef Cattle Research Council

Researchers: Emma McGeough, PhD and Yvonne Lawley, PhD (University of Manitoba)

Approximately 68% of producers in Western Canada currently utilize some form of extended winter grazing. These winter grazing practices allow producers to reduce overwintering costs due to lower inputs and labour. Corn grazing is a popular method of winter feeding for a number of reasons including its very high yield per acre compared to cereal crops or forages, high energy content and its potential to provide shelter for cattle. However, corn is low in protein thus supplemental protein is required to maintain cattle performance particularly under cold weather conditions. The ability to graze other high protein forages between the rows of corn provides the opportunity to reduce the need for protein supplementation. This practice may also have the potential to provide high quality feed for classes of cattle whose level of performance may be limited by the low protein content of straight corn such as backgrounding cattle. Extending the grazing season by maintaining beef cattle on pasture in late fall/winter has been adopted by many Prairie producers as it significantly reduces labor and feed costs compared to confined feeding.

OBJECTIVES

- To identify new combinations of corn grown with high yielding, high protein forages for improved fall grazing.

WHAT THEY DID

Researchers planted four different types of high protein crops between the rows of corn: Italian ryegrass, hairy vetch, radish, and clover, as well as a mix of all four crops. A control crop of just corn was also planted. As nitrogen fertilizer is one of the most expensive inputs for corn systems, each of these intercropping combinations was compared under low (40lbs/acre) and high (100lbs/acre) nitrogen application levels. The corn was seeded in May and the intercrop was seeded when corn had reached the V4 stage (when the 4th leaf collar is visible).

Measurements on plant establishment, corn and intercrop yield, and nutritional value (crude protein, TDN, fiber) were conducted in October and December to evaluate the potential of the intercropped corn as a potential overwinter feed for beef cattle. Corn-intercrop treatments further evaluated to assess the ability to meet nutrient requirements of cattle classes, using CowBytes Beef Ration Balancer.

Manitoba Agriculture and Resource Development Farm Management 2020 Cost of Production tools for crop production, farm machinery and beef cow-calf were used as guidelines for cost of production estimation for all others costs associated with growing corn vs. corn intercrop treatments.

WHAT THEY LEARNED

Intercrops were successfully established between corn rows in 2019 under drought conditions. Corn grain yields were low and there was no grain yield response to the higher rate of N fertilizer under the drought conditions. The presence of the intercrop treatments did not reduce corn grain yield relative to the control. At one site, intercrop treatments that included nitrogen fixing legumes (clover, vetch, mix) had higher yields relative to the control treatment.

Although nitrogen application rate did not increase grain yield or forage biomass, it did increase CP content from 20.5% (low N) to 22.3% (high N) averaged over intercrops and sites. Intercrops ranked similar in crude protein content at both sites and on average Graza Radish had the highest (29%), and Clover the lowest (13.2%), and the remaining crops with intermediate amount (21.7%). Although crude protein content varied among intercrops, the levels exceeded

the requirements of gestating cows, replacement heifers, and backgrounding steers (NRC, 2000), suggesting the value of these crops as protein supplement to low quality forages such as whole corn.

The TDN and crude protein content of corn were not affected by presence of intercrop forages, however the latter was increased with high vs low nitrogen application (6.6 vs 7.5% crude protein). When evaluated in combination given the measured yield of each, the total available forage (corn plus intercrop) met protein requirements of mature beef cows at high nitrogen treatment, and corn with Graza Radish and the four species Mix at low N, but did not meet requirements of heifers and backgrounding steers under the conditions of this study.

Intercropping treatments increased production costs by \$115 to \$350/ac for seed and equipment use associated with the intercrop. Among the intercrop treatments, the costs of production were ranked from highest to lowest as follows: Hairy Vetch>4 Species Mix>Graza Radish>Italian Ryegrass>Red Clover. These relative costs are driven by the seeding rates selected for the study and 2019 seed costs, which may vary.



WHAT IT MEANS

Dry matter yield for all intercropped forages and the mixture were lower than expected at both locations, due to the drought conditions during 2019. However, under these stressful conditions the intercrops successfully established. Given the high crude protein value of these intercropped forages, further evaluation of intercropped corn under non-drought conditions is warranted. Additional assessment of new agronomic practices to increase the yield of the intercrop in combination with the corn (such as wider row spacing or reducing corn populations) may enable corn intercropping to offer high quality overwinter feeds for cattle across western Canada. This proof of concept project showed that intercropping legumes with corn can provide the dietary requirements for cows. Next steps include determining how cows respond to grazing these crop mixes.



Figure 1. High protein forage intercrop mix of Graza Radish, Hairy Vetch, Italian Ryegrass and Red Clover growing in between corn rows in September, 2019 at Kelburn Farm (left) and Carman (right).

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Tips for Winter Water Systems for Cattle

by Canadian Cattlemen

Michelle Panko, program information specialist with Saskatchewan Agriculture, recently offered tips and outlined [winter system options](#) at a Saskatchewan Cattlemen's Association webinar.

For those struggling with freezing water bowls, Panko suggests looking at in-line heat tape, which is inserted into the water line and plugged in.

A utility pump and about 15 feet of four-inch hose with an adapter will also thaw water bowls.

"You just need a five-gallon pail of hot water. You put your pump in there, plug in your pump, and then that hose that's connected, it's going to pump hot water. You can put it down your waterline and jet that hot water down to the depth of wherever it's iced up."

Producers are also using game cameras and their cell phones to monitor water systems. "You do have to have cell service so that can be a limitation."

Look for a game camera with a time lapse mode, or every movement will trigger the camera. "You don't want that happening when it's cattle watering or birds flying into a water bowl, because it's going to send you a gazillion pictures."

Panko also outlined several options for [winter water](#) systems:

1. Water Box. Install insert through frozen ice into water body. Self-operating and can be accessed 24/7 by livestock. Uses geothermal energy from water. Must train animals to use it. May have to scoop ice in cold weather. Consider additional units for a large herd.

2. Aquifer trough/drink tubes. Highly insulated, use geothermal heat from water. May need to remove ice, especially on cold days. Be aware of minimum herd size recommendations.

3. Portable solar systems, such as from Sundog Solar, can be used year-round with a winter insert. Make sure pump size matches water flow capacity. Check well capacity against number of head you're watering. Size system for number of head you intend to water, or more, as pump and batteries can become less efficient over time.

·Propane stock tank heater, purchased separately from solar systems. Offers thermo-statically controlled heating. Adjustable brackets allow attachment to most metal, concrete or poly tanks. Keeps a three- to five-foot radius of water open.

·DU~AL Year-Round Watering System uses a flameless catalytic heater with propane. Insulation conserves heat. Use with solar system or adapt to underground pressurized line.

·Drain-back bowl with motion eye, available from several companies. Motion eye activates submersible pump, excess water drains into wet well. Water supply should be within 15 feet of soil surface (dugout or high water table). Corrugated poly cribbing preferred for wet well, as it doesn't rust and is sturdy. Need a filter to keep debris out of pump when water drains. Can work with a solar system.



·Frost-free nose pumps. Panko recommends training cattle to use them. Best used on top of well with high water table or wet well off a dugout, she says. No pump or heat source required. Nose pump is mounted on insulated cribbing. One nose pump should water 100 head.

·Thermosink Livestock Watering Systems work with pressurized lines, no power required. Operate with geothermal heat. May have to chip ice if not enough cattle are drinking, cattle don't drink within 24 hours or it's -30 C or colder. Use mineral oil around float to prevent freezing.

·Trough made from an industrial mining tire. Nearly indestructible. Usually used with buried, pressurized waterline. Burying tire pit below ground level should allow for geothermal heat. A thicker tire provides more insulation. In cold weather, will need to clean ice. Small calves can be bumped into large troughs, so design in a way to prevent that and/or allow cattle to get out.



**LIVESTOCK WATER MANAGEMENT:
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**PART 2: PRACTICAL
APPROACHES TO IMPROVING
WATER QUALITY**

MARCH 14, 2024 @ 7:00 PM

Dwayne Summich, Livestock and Feed Extension Specialist with the Saskatchewan Ministry of Agriculture

Join Dwayne Summich as he discusses practical methods of maintaining or improving livestock water quality, including options for restricting livestock access to water bodies and different watering system options.

The evening will conclude with a brief discussion on funding available to assist producers with implementing new watering systems including the LARA Watershed Resiliency and Restoration Program (WRRP).

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From the LARA Garden **Making Your Own Potting Soil**

Potting soil differs from garden soil in that it contains no soil. It is lighter and fluffier than ground soil to allow enough air and water for healthy root growth while providing enough anchorage for the roots. Potting soil is also sterile so there is no worry about introducing pest or disease to your seedlings.

The three main components of potting soil are peat moss (or coconut coir) for moisture and nutrient retention, pine bark for anchorage and either perlite or vermiculite for air space. Fertilizer could also be added to the potting soil when mixing; keeping in mind you will need to adjust the fertilizer later on.

Basic Potting Soil Mixture

- 10 quarts peat moss or coconut coir
- 5 quarts perlite
- 5 quarts vermiculite
- 5 quarts screened compost or composted cow manure
- 2 cups fine sand
- 2 cups pelleted time-release fertilizer

Mix thoroughly; adding enough water to hold together but not so much as the mixture is over saturated.



A field scouting guide for canola producers

Is it verticillium stripe or blackleg?

Blackleg and **verticillium stripe** can both cause stunting, leaf chlorosis, lodging, dieback and premature ripening symptoms. Use this guide to differentiate between these two diseases when scouting your canola crops.

STEP 1: Check external symptoms

Blackleg is a stubble-borne disease caused by a fungus that favours wet/warm conditions. Though infection happens in spring, these symptoms are easier to identify later in the growing season:

- Cankering at the base of the stem where it becomes woody. Basal stem lesions may be blackened at the base, with stem tissue constricted or pinched at the soil surface (A).
- Lesions on cotyledons, leaves and stems, usually at the base or points of leaf attachment (B).
- Under moist weather conditions, a viscous pink liquid carrying the pycnidiospores ooze from pycnidia (C).
- Dotting of numerous small, black round pycnidia (D).



Verticillium stripe is a soil-borne disease caused by a fungus that favours infection in stressed canola plants under dry/hot conditions. It is easiest to identify just prior to swath timing or immediately after harvest (prior to decomposition) by:

- Partial stem senescence on one side (half) of the stem (A).
- Peeling back of the outer stem (epidermis) and faint black vertical striping on stems which darkens with maturity (B).
- Shredding and breakdown of the vascular system or inner stem (without sclerotinia-causing sclerotia) (C).
- Late in the season, tiny black ("peppery" looking) microsclerotia (smaller than blackleg pycnidia) occur on stems (D).



STEP 2: Check the cross section

Cut the stem at ground level near the root and view the cross section.

Verticillium stripe infects the plant from the root up the vascular system, so it can be identified by a greyish hue (not black) across entire cut, with a starburst pattern in earlier stages (**A**).



Blackleg infects plants from the leaves down, so it can be identified by black and/or brown necrotic discolouration, often in pie-shaped sections. It is fully black in extreme cases (**B**).



Plants with both blackleg and verticillium stripe will exhibit symptoms of both diseases (**C**).



STEP 3: Check the stem

Snip another stem at ground level near the root, cut a few inches of the stem longitudinally and observe.

Verticillium stripe exhibits hollowing and darkening of the inner stem (as the vascular tissue breaks down) with symptoms extending several inches up the stem (right).



Blackleg exhibits blackening of the cortex and epidermis that is restricted to the lower stem, without hollowing of the stem (right).



Plants with both blackleg and verticillium stripe will exhibit a hollow and darker inner stem along with blackening of the cortex and epidermis (photos right).



STEP 4: Collect plant samples

Submit samples for both blackleg race identification and verticillium stripe testing.

Visit the Canola Encyclopedia for more information on these diseases and talk with your agronomist about a management plan.



Welcome Angelica!

Born and raised in Colombia, I moved to Canada when I was 17 years old. I started my undergraduate degree in environmental science with a certificate in GIS at York University. Afterwards, I started an MSc. in environmental Science at Dalhousie University (formerly Nova Scotia Agricultural Science, NSAC). My research was focused on site-specific application of herbicides and fertilizers in lowbush blueberry fields in Nova Scotia. In Nova Scotia I met Lance Ouellette (hence my last name), a French-Canadian from New Brunswick. In 2016, I completed my PhD at the University of Guelph at Ridgetown, Ontario, where I studied the effects of herbicide residue in cover crop roots and subsequent impact in soil aggregate stability and fertility.

I became a research technician for BASF and worked with fungicide and herbicide trials in Winkler, Manitoba, where I got a grasp for western agriculture and honed my skills in field crops such as canola, peas, lentils, wheat, barley, and oat. Furthermore, I was the research coordinator at the North Peace Applied Research Association (NPARA) where I developed leadership and strengthened my agricultural background. My goal at LARA is to develop new research ideas to improve sustainability in agricultural practices.

Welcome Lance!

I'm Lance Ouellette, and I am very happy to join the team at LARA as the new Research Agrologist. I am originally from Grand Falls (New Brunswick). Although I'm not from a farm, I have worked on farms all my life. I completed my Bachelor's of Science in 2010 (Environmental Sciences, Dalhousie University), and my Master's of Science in 2015 (Environmental Sciences, University of Guelph). Following my studies, I worked as a field agronomist with Cargill, and as a research technician at the University of Manitoba. My background is mostly in soil science, but I have done field research on a variety of themes: soil fertility, bio-stimulants, crop protection (i.e. pesticides), intercropping, compost/organic amendments, variety/cultivar, and cover crop trials.

My most recent position was as the manager at the North Peace Applied Research Association, where we did lots of work on regenerative practices. When I'm not working, I am usually playing music, reading, skiing, and/or travelling with family. My wife, Angelica, is also starting with LARA as the new research scientist. We look forward to the challenge of trying to improve soil and crop productivity while maintaining and/or increasing farm profitability.

Best,
Lance



Impact of Varying Rates of Environmentally Smart Nitrogen (ESN) on the Performance of Spring Wheat in Northeastern Alberta

by Momna Farzand, LARA

Objectives:

1. To determine the impact of utilizing varying rates of Environmentally Smart Nitrogen (ESN) on spring wheat production in Northeastern Alberta.
2. To determine the economic feasibility of utilizing Environmentally Smart Nitrogen (ESN) in spring wheat production in Northeastern Alberta.

Background: Growth in grain crop yields has been declining in recent years while it is estimated that annual grain crop production will need to increase to around 3 billion tonnes by 2050 to feed a fast-growing human population (FAO 2009). According to the Food and Agriculture Organization (2009), this increase in crop yield will not come from land expansion in developed countries, but ninety percent will be from higher yields and increased cropping intensity.

A large portion of today's current food production numbers is due to the use of commercial fertilizers which consists of Nitrogen (N), Phosphorous (P) and Potassium (K) and Sulphur (S). However, actual N uptake from fertilizer applied to a grain crop is estimated at only around 50%, with the rest lost through environmental events such as volatilization and denitrification. It can be determined that the use of commercial fertilizers will increase in order to meet production demands. The development of effective nutrient (N, P, K and S) management strategies will be key in maintaining and enhancing current grain crop production in Alberta.

The use of enhanced efficiency fertilizers, such as environmentally smart nitrogen or ESN, is one method of reducing N loss during grain crop production. Environmentally smart N is the most widely used slow-release N product on the market for agricultural crops (Walsh & Christiaens, 2014). It is produced through the use of a flexible polymer coating or membrane that protects against loss mechanisms such as volatilization, denitrification or leaching. This coating allows water to imbibe into the granule to create a liquid solution that can then move out of the membrane based on crop N demands and soil temperature. The ability to match fertilizer use to crop requirements could translate into increased yield and overall cost savings to Alberta producers.

Method: The trials were conducted in the County of St. Paul, Smoky Lake County and the MD of Bonnyville in 2020-

2022 growing seasons, using a randomized complete block design (RCBD) with four replications to reduce error. Prior to seeding, a soil sample was collected to determine fertility recommendations and a blend fertilizer was side-banded during seeding.

The wheat variety used was AAC Brandon. Five different inclusion rates of ESN as a percent of the total nitrogen in the fertilizer were used: 30%, 50%, 70% and 90%. Additionally, a check plot with no ESN was included for comparison. Prior to harvesting, the length of each plot was recorded to calculate the harvested area. Harvesting was done using Wintersteiger combine. Each plot was harvested individually, and other yield parameters were recorded accordingly.

Results: The results for the ESN wheat are shown in the tables below. The treatment with 90% ESN produced the highest yield and the treatment with 70% ESN produced the lowest yield. However, we have not observed any significant effect of different ESN blends applied on wheat grain yield in this study. Our results are in agreement with Nelson et al. (2009) and Hyatt et al. (2010) who reported non significant effect of ESN on crop yield as compared to urea and other conventional N fertilizers. Similarly, Khakbazan et al. (2013) conducted a multi-year study in western Canada to evaluate the effect of ESN for barley, wheat and canola trials and concluded that occasional yield advantage derived by ESN was not sufficient to offset the cost of fertilizer. Although we did not notice significant effect of different ESN blends in our trials but environment has significant effect on grain yield in wheat. The significant effect of environment can be attributed to the variation in soil conditions.



We received less precipitation during the St Paul 2022 growing season as compared to St Paul 2020 and Smoky Lake 2021 growing seasons. But the highest grain yield in wheat was recorded in St Paul 2022 growing season and the lowest grain yield in wheat was observed in Smoky Lake 2021 growing season. Another report has also indicated that less rainfall provided greater yield benefits in ESN trials conducted on winter wheat in North Carolina (Rajkovich et al., 2017).

We conclude that due to the environmental conditions, the

ESN blends may not have been fully utilized by the plants, and this may be the reason for the results that were achieved. This information is still valuable to producers and industry stakeholders as it shows how environmental factors can affect ESN. Also, with the data and information collected over the past three years, producers can compare results and make decisions that are best suited to their operation. This trial was conducted to allow producers to be able to see how varying rates of blended ESN can have an impact on spring wheat production in Northeastern Alberta.

Table 1.2. Effect of different ESN blends on spring wheat grain yield (bu/ac) at St. Paul, Smoky Lake, and Fort Kent, in 2020-2022 growing season.

Treatment	SP-20	SL-21	SP-22	FK-22	Mean	Group
ESN 90%	50.6	37.1	88.7	76.7	63.3	a
Check	46.4	38.2	89.6	78.3	63.1	a
ESN 50%	49.2	33.0	89.4	78.2	62.5	a
ESN 30%	50.6	35.0	90.2	73.8	62.4	a
ESN 70%	49.9	33.3	88.6	77.2	62.3	a
Mean	49.4	35.3	89.3	76.8		
Group	c	d	a	b		
CV = 13.4						

Note: SP-20: St. Paul 2020; SL-21: Smoky Lake 2021; SP-22: St. Paul 2022; FK-22: Fort Kent 2022; Means followed by the same letters are not significantly different from each other.

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LAKELAND AGRONOMY
ASHMONT AGRIPLEX

MARCH 12, 2024
10:00 AM - 3:00 PM

Update

CANOLA DISEASES TO WATCH FOR IN 2024
Dr. Stephen Strelkov with the University of Alberta will discuss prevalent canola diseases and their management practices including clubroot and verticillium wilt.

THE COLD TRUTH ABOUT VIGOUR: TAKING A TEMPERATURE CHECK ON SEED QUALITY
Sarah Foster, founder of 20/20 Seed Labs, will discuss the seed quality and health journey from the time of harvest to seeding the next spring.

NUTRIENT MANAGEMENT PLANNING
Trevor Wallace, Nutrient Management Specialist with the Government of Alberta will outline nutrient management planning including soil testing, application methods and new manure management planner software.

ADDING LIFE TO YOUR SOILS WITH ACF-SR
Joshua Day Chief, CEO of Advanced Ag, will discuss how to restore soil health through the use of biostimulants.

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Livestock Gentec wins ASTech Award

Lakeland Agricultural Research Association (LARA) is pleased to congratulate Livestock Gentec on their ASTech Award!

If you want to go fast, go alone. If you want to go far, go together[1] – and see farther by standing on the shoulders of giants[2]

And so it has been with Drs. John Basarab and Graham Plastow at Livestock Gentec at the University of Alberta. John was delighted to accept the 2023 Best in Sector ASTech Award for INNOVATION IN AGRICULTURE / AGRIFOOD on behalf of Livestock Gentec and the whole team (collaborators, industry partners and funders) at the ceremony in Calgary on November 3rd.

Seeing Farther: Benefits that continue to be delivered to the beef industry include:

- Conversion to genomic SNP parentage technology.
- Assembly of the largest database of Canadian commercial crossbred cattle.
- Improving feed efficiency of local herds and breeding stock.
- Development, commercial validation, and delivery of genomics tools for commercial producers that include: EnVigour HXTM genomic breed composition and hybrid vigour; Replacement Heifer Profit Index ScoreTM ; and Feeder Profit IndexTM .

Going Together: John's drive to improve the beef sector has been guided by "his giant" Dr. Roy T. Berg for over 35 years, and supported by industry and provincial and federal governments.

John worked with Alberta Agriculture as a research scientist and is now RDAR Research Professor in Livestock Genetics at the University of Alberta. He has been a member of the executive of Livestock Gentec since 2008.

Going Far: With Graham and the Gentec team, John has worked tirelessly to deliver unbiased advice on how genomics tools can best be applied to improve beef herds and producer productivity.

[1] African proverb

[2] Isaac Newton, 1675. "If I have seen further, it is by standing on the shoulders of giants".





The Best Ideas are “Stolen”

by Livestock Gentec

A “warm” welcome to 2024. What better way to start off than picking up where we left off in 2023.

Building on our last article that looked at the cow herd and, specifically, replacement heifers, this article explores how genomics, EPDs, and various traits of economic importance can be harnessed to improve the economic performance of the Alberta beef industry through strategic bull selection. There, the focus was on how to identify and select for animals with the greatest likelihood of producing a calf every year, thus ensuring their longevity in the herd and the profitability of the producer. The key messages were that management and consistency are critical. Keep doing those things that have proven themselves to be profitable over time. These included:

- Matching the cow’s biotype to environment and a producer’s management practices (rainfall, forage quantity / quality, body weight, milk)
- Select from easy and early “calvers”
- Avoid calving difficulty
- Grow heifers to reach 60% of mature-cow weight at start of breeding
- Ensure a Body Condition Score (BCS) of 2.5 to 3.5 at the start of the breeding season (1-5 BCS system)
- Assess for conformation, structural soundness and docility
- Retain heifers from cows with many daughters in the herd
- Keep / maintain a cow-based record system.

At the same time, it is important to be aware of new tools and technologies that could improve best practices ... including genomics. Genomics provides DNA-based indicators for various traits that can be pedigree-based (EPDs), genomically-enhanced pedigree information (gEPDs) or solely DNA-based Molecular Breeding Values (MBVs) and are usually followed by an indication of their accuracy. In general, a trait accuracy at or above 0.3 is a low-to-moderate predictor; above 0.5 to 0.6 is a good predictor; while the scientific term for a very low accuracy of less than 0.1 is “a guess”.

Individual trait values are often aggregated across the selected traits to arrive at a single number reflecting the anticipated economic impact the traits are likely to have in a herd both now and in the future.

Referring to the theme of the previous article that focused on the cow herd and improving cow-calf fertility:

Hybrid vigour is highly related to improvements in fertility, resilience, and longevity in the cowherd.

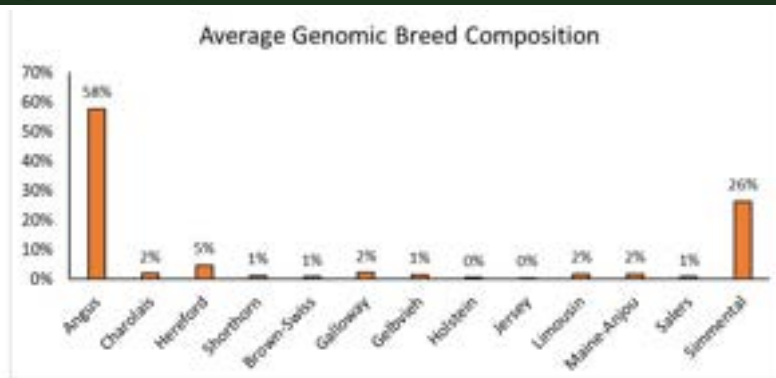
Significant improvements can often be achieved with a single, well-chosen crossbreeding decision.

- It is well established that crossbreeding results in greater hybrid vigour, and that hybrid vigour is highly related to improvements in fertility, resilience, and longevity in a herd.
- Significant improvements can also often be achieved with a single, well chosen, crossbreeding decision.

Introducing ... The Bull.

In terms of determining the hybrid vigour of the next crop of replacement heifers, nothing is more impactful than selecting the bull(s) involved. Given the importance of hybrid vigour as it relates to the fertility and longevity of the cow herd, the first decision relating to bull selection begins with breed composition. The greater the genetic diversity, the greater the hybrid vigour and related benefits. The challenge is to balance the complexity and cost involved to optimize the benefits of hybrid vigour achieved.

The chart below represents a crossbred animal comprised predominantly of Angus and Simmental with a small percentage of Hereford. The breed fractions less than 3% are not useful for making breed management decisions and occur due to the sharing of alleles across breeds. A simple means of increasing hybrid vigour would be to select, for example, Hereford bulls for the next breeding season. You would then alternate between Angus, Simmental, and Hereford bulls in subsequent years to optimize the level of hybrid vigour using three breeds. This can be accomplished by grouping cows of similar breed composition (e.g., 40 to 50%AN; 20 to 30%SM and 5-25% HE) and mating them to the breed with the lowest meaningful percentage based on the cow’s mean breed composition. Using crossbred bulls to introduce a third breed is also an option to increase the degree of hybrid vigour, depending on the goals and preferences of the producer.



Once the desired breed composition of the bull has been determined, then, as with the heifers, the individual bulls in the breed can be assessed across the span of economically-important traits.

The table immediately below shows the traits contained in the Feeder Profit Index™ reflecting the values of a typical Alberta producer. The traits focus on the efficiency, growth, and carcass traits associated with various bulls, and the accuracy of those predictions. Looking at a couple of examples, Bull 1 has the best gEPD for Residual Feed Intake (indicated by the lowest value, -0.16), Bull 2 the worst, while Bull 4 has the average RFI as indicated via an gEPD of “0”. For Hot Carcass Weight, Bull 1 has the lowest predicted value, followed by Bull 4, and Bull 2. Similarly, Bulls 1 and Bull 4 have the poorest Carcass Marbling Score, while Bull 2 is predicted to have very high Marbling.

gEPD / Accuracy	Bull 1	Bull 2	Bull 3	Bull 4
Residual Feed Intake	-0.16	0.07	-0.05	0.00
Accuracy	0.596	0.521	0.478	0.587
Dry Matter Intake	-0.03	0.07	-0.11	0.19
Accuracy	0.668	0.591	0.554	0.659
Ave. Daily Gain	0.04	-0.02	-0.02	0.04
Accuracy	0.625	0.549	0.508	0.616
Ave. Backfat	1.02	1.07	0.42	-0.40
Accuracy	0.549	0.438	0.416	0.549
Hot Carcass Weight	0.10	2.17	1.16	1.48
Accuracy	0.589	0.479	0.460	0.590
Lean Meat Yield	-1.10	-1.06	-0.58	0.31
Accuracy	0.573	0.460	0.440	0.573
Rib Eye Area	-1.29	-0.28	-0.54	0.30
Accuracy	0.596	0.485	0.466	0.597
Carcass Marbling	-6.20	18.82	18.88	-14.03
Accuracy	0.568	0.459	0.438	0.569
FPI	40.65	-3.34	9.18	8.05
Accuracy	0.523	0.452	0.417	0.517

So, which is the “best” bull? As was the case when selecting replacement heifers using genomics, it can get complicated very quickly given all the cells in a spreadsheet – and this example does not include traits such as calving ease and milk production, among others. This is where a weighted index can simplify the process by assigning a weighting to each trait based on its economic importance to the producer.

Based on the gEPD, adjusted for its individual accuracy as well

as its importance to producer profitability, a score can be tabulated for each animal, allowing the producer to compare one animal to another to make an informed decision. This is what is represented in the table to the right, indicating that Bull 1 is likely to be the most profitable choice. This will intuitively ring-true to many. It is the most efficient animal, which (here) more than offsets the impact of a slightly lower Hot Carcass Weight and less Marbling Note that the degree of hybrid vigour takes on a different significance here than in the cowherd. Here, a low hybrid vigour value indicates an animal with low genetic diversity, while higher scores reflect a more crossbred bull. Purebred herds are developed to concentrate specific genetics so that they can be dispersed into crossbred herds to produce those traits desired by the consumer profitably.

The BS – The Bull Summary

By knowing the genetic makeup of individual animals, producers can select for and manage efficiency, growth rates, carcass quality and

genetic diversity in their herds. When applied to bull selection, these principles allow producers to identify superior genetic traits with greater precision, ensuring a more targeted and effective breeding program.

Feeder Profit Index™ Summary

Bull	Hybrid Vigour	Feeder Profit Index
Bull 1	9%	40.65
Bull 2	45%	27.71
Bull 3	62%	9.18
Bull 4	51%	-3.34
Bull 5	8%	-11.35

Given the number of offspring a sire can produce each year, they are the quickest way for a producer to affect the composition of their cow herd. Few would argue that fertility is one of the, if not THE, key profitability drivers of the commercial cow calf producer – and one of the strongest predictors of herd fertility is hybrid vigour.

Are you giving this leading indicator the attention it deserves in your herd?

“Heterosis pays the bills in terms of fertility & stayability for the commercial producer.”

Clint Rusk

Executive Vice President,

American International Charolais Association

The Best Ideas are Stolen

That was some of the best advice ever given – along with the explanation that people a lot smarter than I am had thought about an issue a lot longer than I had. All I had to do was be smart enough to know which ideas to steal. So, to close this

article, a couple of ideas recently stolen (let's just call them "borrowed") from presentations given at the 2023 Beef Improvement Federation:

- "Heterosis pays the bills" in terms of fertility and stayability for the commercial producer – (+38% longevity; +17% number of calves (lifetime); +25% cumulative weaning weight (lifetime); +3.8% weaning weight; +3.7% calving weight).

"The economic and production benefits associated with heterosis are documented by decades of industry-wide research in commercial crossbreeding systems."

Clint Rusk, Executive Vice President, American International Charolais Association

<https://www.youtube.com/watch?v=DUom4VuOEPQ>

(45:22 timestamp)

- In one-bull herds, the last three bulls account for 88% of the genetics of the current calf crop – getting it wrong is a huge risk.

Troy Royan University of Tennessee (Advances in Producer Applications: Why should commercial cattlemen be interested in genomics)

<https://www.youtube.com/watch?v=dJdhlhX3pYM> (2:17 timestamp)

- What gets managed gets done – Anonymous.

For questions or comments, contact LARA or Gentec at director@laraonline.ca and / or lsgentec@ualberta.ca respectively.

Job Opportunity!

Summer Agricultural Research Technician

LARA is looking for 2-4 ambitious and hard-working Summer Agricultural Research Technicians to be a part of our team. In this position, you will work closely with our program coordinators and gain hands-on experience in all aspects of the applied research process. This includes field design and planning, implementation of projects, collecting and analysing data and preparing extension activities.

If you enjoy time outdoors, you will appreciate the field work associated with agricultural research. Duties will include seeding, mowing, spraying, harvesting, plot maintenance and data collection. There will also be occasional handling of livestock.

Agricultural and machinery experience is considered an asset, but is not imperative as training will be provided. Applicants must hold a valid class 5 drivers license and have a safe driving record.

We are looking for someone with a genuine interest in the agriculture industry!

Please submit your resume and cover letter to:

Alyssa Krawchuk, Executive Director
Lakeland Agricultural Research Association
director@laraonline.ca





www.laraonline.ca

Lakeland Agricultural Research Association

Annual General Meeting

and

Research Update

Goodridge Hall

March 6, 2024

Doors open at 4:00 pm

Appetizers at 4:30 pm

Supper at 6:00 pm

Results of LARA's 2023 research trials will be discussed including regional variety trials, silage variety trials, the Regenerative Alberta Living Labs and more.

To register, please call the LARA office at (780) 826-7260

There will be producer rep elections for the LARA Board for the County of St. Paul, Smoky Lake County and Lac La Biche County

Visit our website or call the LARA office for a nomination form





Lakeland Agricultural Research Association

Mission Statement:

*Lakeland Agricultural Research Association (LARA)
conducts innovative unbiased applied research and extension
supporting sustainable agriculture.*

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