



OVER THE FENCELINE

Fall 2025



Source: Kabir Makan



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Source : Kabir Makan



Vision

**Improving sustainability through
innovation in agriculture**

Mission

**To perform high-quality producer-
driven research & knowledge transfer
for the advancement of all agriculture
stakeholders**

ACKNOWLEDGEMENT

**Battle River Research Group
gratefully acknowledges the base
funding provided by Results Driven
Agriculture Research (RDAR). This
foundational support enables BRRG to
carry out applied research,
knowledge transfer, and producer-
focused innovation across East
Central Alberta. RDAR's investment is
critical to advancing sustainable,
science-based agriculture in our
region.**

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MANAGER'S NOTE



Dr. Ahsan Rajper
Manager & Crop
Specialist

It is my pleasure to share the Manager's Note for the Battle River Research Group's Fall Newsletter. Just like last year, 2025 has been another strong and productive year for both our Applied Research and Extension programs. On the research side, BRRG conducted a total of 21 trials this season, including 18 small-plot trials and 3 on-farm research projects, covering over 140 acres and more than 1,000 plot units across multiple soil zones. These projects investigated a wide range of agronomic topics, including soil health, soil water-holding capacity, fertility management in feed barley, corn tillage and fertility, corn-soybean intercropping, pasture rejuvenation for soil improvement, and lupin and pea variety trials. Our research team, led by Alex Olson and supported by our dedicated summer technicians Eve, Kaeden, and Tingting, deserve immense appreciation for their hard work and commitment. Their efforts in field preparation, data collection, and equipment operation made it possible to complete an ambitious and successful research season.

Weather variability also played a significant role in shaping this year's research outcomes. Precipitation patterns in the Forestburg area were quite different from 2024. While total rainfall from January to September was slightly lower overall, June and July 2025 were considerably wetter, with July receiving over three times more rainfall than the same month last year. These wetter mid-summer conditions greatly improved soil moisture and helped crops recover from early-season dryness. However, late summer and fall were notably dry. This uneven rainfall pattern provides important context for understanding yield, lodging, and soil health results across our trial sites.

On the extension side, 2025 has been a record breaking year. By the end of this year, BRRG will have delivered over 30 extension events, including workshops, webinars, and field days, representing a 25 percent increase from last year. These programs continue to build strong engagement with local producers and partners. Special thanks go to our Extension Coordinator, Kabir Makan, for his leadership in organizing these impactful events and ensuring BRRG remains a trusted source of applied knowledge in the region.

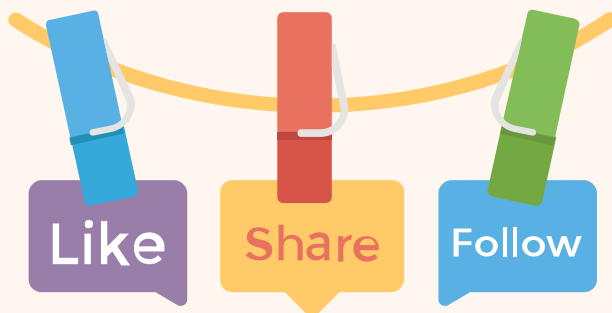
Looking ahead, BRRG is expanding its research capacity with the acquisition of a new small-plot seeder equipped with an in-furrow liquid application system, funded through support from the Government of Alberta. This addition will allow us to test advanced fertilizer and biological amendments in a no-till setting and will open exciting new opportunities for research innovation and collaboration in the coming seasons. As always, we sincerely thank our partners, producers, and funders, especially Results Driven Agriculture Research (RDAR) and the participating counties of Flagstaff, Beaver, Paintearth, and Stettler, for their continued support and trust in our work. Your contributions enable us to pursue meaningful research and deliver results that improve productivity, sustainability, and resilience for Alberta's producers.

Catch Up on Missed & Upcoming Webinars, Seminars

For those who missed any of these enriching events, Battle River Research Group offers the opportunity to catch up on their website [here](#) or our [YouTube channel](#).

Stay connected with Battle River Research Group on Twitter: Battle River Research Group @BRRG_Ag for updates and information about upcoming events.

With a year filled with growth, learning, and community spirit, Alberta's farming community is thriving, and the Battle River Research Group is at the forefront of this growth, continuously enriching the lives of farmers and promoting sustainable agriculture. Here's to a year of growth, learning, and continued success!



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WATER ON THE LAND: MANAGING WETLANDS FOR FARM & COMMUNITY RESILIENCE



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Kyle Lund
Alberta Environment

Agenda for the workshop :

1. General Overview on Wetlands – Ecological and agricultural importance of wetlands.
2. Riparian Restoration Funding Program – Current funding opportunities available.
3. The Water Act & Agriculture – Impact on farmers and funding administered by Alberta Environment.
4. Surface Water Management – Beaver County's perspective on local challenges and strategies.



22 OCTOBER

10 AM

LUNCH PROVIDED

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OPTIMIZING HEALTH QUALITIES OF BEEF: MSU SCIENTISTS ANALYZING HOW NUTRIENTS IN BEEF ARE IMPACTED BY WHAT CATTLE EAT

Jack Falinski

Jenifer Fenton and Jason Rowntree are exploring ways to authenticate grass-finished beef based on its nutritional profile.

EAST LANSING, Mich. — Instead of answering, “Where’s the beef?” Michigan State University scientists are gaining a deeper understanding of what’s in the beef. A paper recently published by two MSU researchers highlights new data on how the nutrient composition and healthfulness of beef is impacted by what beef cattle feed on.

Jenifer Fenton, a professor in the Department of Food Science and Human Nutrition, and Jason Rowntree, the C.S. Mott Professor of Sustainable Agriculture in the Department of Animal Science, published their findings in October 2024 in npj Science of Food.



Jenifer Fenton, professor in the MSU Department of Food Science and Human Nutrition.

Funded by the Greenacres Foundation, Fenton and Rowntree, whose work is also supported by MSU AgBioResearch, examined fatty acids and other organic compounds in grass-finished beef from cattle raised using rotational grazing methods, specifically studying whether analyzing the nutritional components in beef can lead to accurate predictions on what cattle were fed.

Being able to determine the feedstuff cattle ate — such as grass, supplemental feeds or grains — based on the nutrients found in beef could create an approach for how grass-finished beef can be authenticated.

Previous research of theirs published in 2022 in Frontiers in Sustainable Food Systems confirmed several nutritional benefits of grass-finished beef compared to grain-finished beef from cattle fed barley, oats or corn. Those benefits included less fat, more omega-3 polyunsaturated fatty acids (which support heart health) and a lower omega-6 to omega-3 ratio. Too high of a ratio can cause inflammation in the body and heighten disease risk.

“There’s variation in beef, yet we tend to put it under one umbrella,” Rowntree said. “I often say beef is healthy, but there’s nuance to it.”

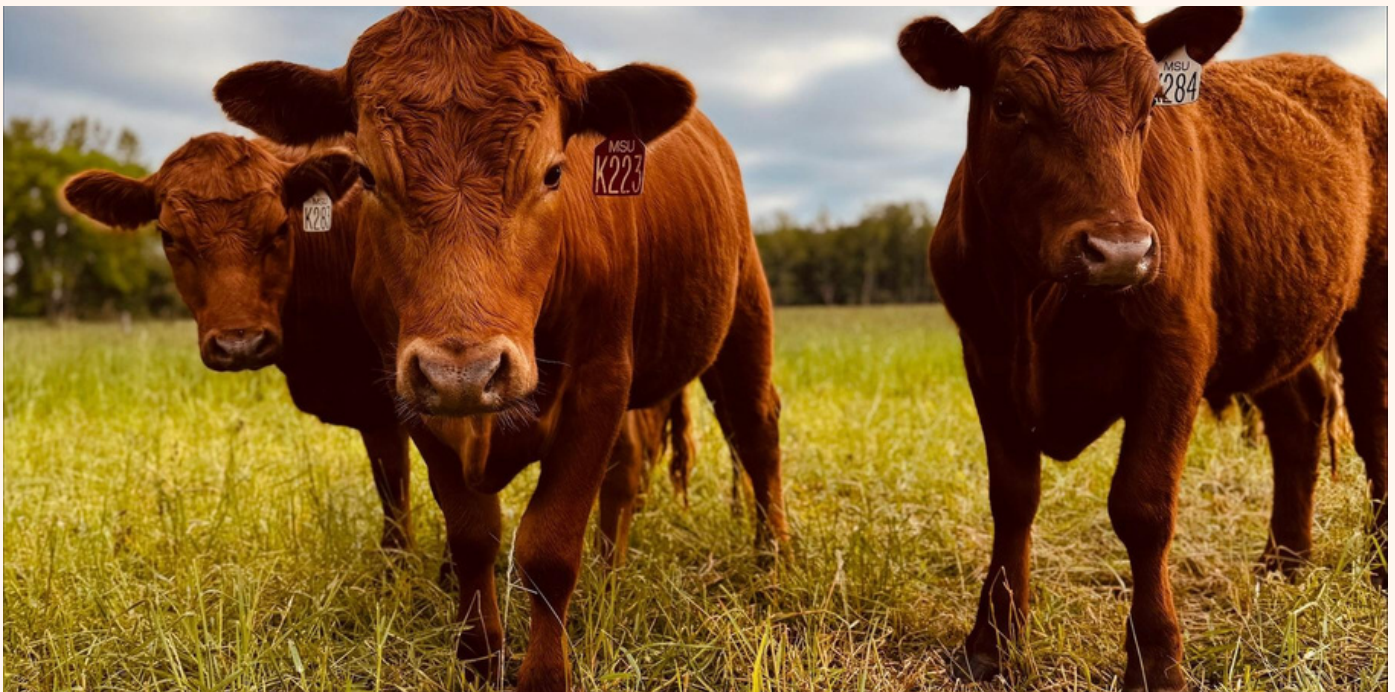


Jason Rowntree, C.S. Mott Professor of Sustainable Agriculture in the MSU Department of Animal Science.

Fenton said the omega-6 to omega-3 ratio in grass-finished beef is usually about 2-to-1. However, some samples her team previously collected had ratios as high as 28.3-to-1.

“How you feed the animal can change the omega-6 to omega-3 profile dramatically,” Fenton said. “Salmon is one example that gets talked about a lot. Farm-raised salmon when fed corn and soy contain higher amounts of omega-6 fatty acids compared to wild salmon, which contain more omega-3 fatty acids because they’re feeding on small fish that eat algae.

“The same concept is true for beef. When cattle are fed a high proportion of corn and soy, the beef has higher amounts of omega-6s relative to omega-3s. On the commercial project we did prior, we saw wide variations in the ratio from 2-to-1 all the way to 20-to-1 and more, but the beef samples should’ve all been close to 2-to-1 because they were purportedly grass-finished. So, we’ve been working to identify potential supplemental feeds that might explain the variation.”



Beef cattle at the MSU Upper Peninsula Research and Extension Center (Photo Credit: Jenifer Fenton and Sidney Fenton).

For some farmers and ranchers who practice rotational grazing and produce beef labeled to be grass-finished, fresh forage isn't always available for cattle due to snow cover and other seasonal interruptions. As a result, cattle are fed supplemental feeds such as hay, baleage (baled silage), soybean hulls and other diets.

The American Grassfed Association provides an approved list of supplemental feeds for cattle grown to produce grass-finished beef, but Fenton and Rowntree sought to provide evidence that could support ways to accurately authenticate grass-finished beef. They did this by observing differences among the fatty acids and secondary metabolites in the beef they sampled and then predicted which feeds were fed to cattle based on the information they recorded.



Secondary metabolites refer to bioactive compounds that aren't associated with cell growth or development but play a role in how organisms function and survive in relation to their environment. Previous studies — including one funded partly by M-AAA and published by Fenton and Rowntree in 2023 in *Foods* — have demonstrated how secondary metabolites produced by plants responding to their environment have antioxidants and anti-inflammatory agents that can be transferred to cattle fed on grass.

Rowntree, who also serves as the co-director for the [MSU Center for Regenerative Agriculture](#), said land management will continue to be an important research topic moving forward to ensure the feedstuff cattle eat and graze on is nutrient dense.

“There is a unique demand for understanding the nutrient density of the food we produce,” Rowntree said. “Our premise is that healthy soils equal healthy land, and healthy land equals healthy plants, animals and people. Understanding how management influences the nutrients in food is a growing and much needed area.”

For this project, Fenton, Rowntree and the team examined beef from four cattle groups at the [MSU Upper Peninsula Research and Extension Center](#), with each group being fed different feeds and/or exposed to different environments. Group 1 fed on the pasture and was supplemented with hay. Group 2 fed on the pasture and was supplemented with baleage. Group 3 fed on the pasture and was supplemented with soybean hulls. Group 4 was confined and fed baleage and soybean hulls.



Research students collecting samples at the MSU Upper Peninsula Research and Extension Center (Photo Credit: Jenifer Fenton and Sidney Fenton).

From the data, the team could predict what each group was fed with accuracies of 100%, 50%, 41% and 97%, respectively. Hay – based on its 100% accuracy prediction – was described in the paper as the “gold standard” to supplement with fresh forage for a reliable authentication of grass-finished beef. Likewise, the team could predict with a high degree of certainty which beef samples came from cattle fed solely forage- or feed-based diets.

Fenton said while a few differences among the samples confirmed certain supplemental feeds, such as hay, present more favorable characteristics in grass-finished beef than others, all the feeds they tested remain stable options to supplement with fresh forage.

“I think a farmer can feel assured that if they feed these byproducts at a rate similar to what was done in the study during the winter or at other points in time, the ones we’ve measured won’t greatly influence the omega-6 to omega-3 ratio,” Fenton said.

The next step of this research is currently underway as the team conducts similar tests to examine the nutritional profile of beef from cattle fed distillers grains. Additionally, Fenton said partners from [Cal Poly Pomona](#), [Chapman University](#) and [Utah State University](#) are monitoring how metabolic genes change in response to what cattle eat, as well as the extent to which bioactive compounds from biodiverse pastures accumulate in grass-finished beef.



Research students observing beef cattle at the MSU Upper Peninsula Research and Extension Center (Photo Credit: Jenifer Fenton and Sidney Fenton).

Fenton said one area of research needing to be further explored, noting the team may investigate it in the future, is how human health is affected when eating beef from cattle fed different diets and how consumers choose among different beef products.

“We’d like to work toward taking the grass-finished beef with a nutrient profile favoring human health and then beef from conventionally fed cattle and feeding it to humans to see if there’s data that shows lower inflammatory markers or a more beneficial cholesterol profile between the two,” Fenton said.

References

Prepared by Jack Falinski

<https://www.canr.msu.edu/news/optimizing-health-qualities-of-beef-msu-scientists-analyzing-how-nutrients-in-beef-are-impacted-by-what-cattle-eat>

Michigan State University AgBioResearch scientists discover dynamic solutions for food systems and the environment. More than 300 MSU faculty conduct leading-edge research on a variety of topics, from health and climate to agriculture and natural resources. Originally formed in 1888 as the Michigan Agricultural Experiment Station, MSU AgBioResearch oversees numerous on-campus research facilities, as well as 15 outlying centers throughout Michigan. To learn more, visit agbioresearch.msu.edu.



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I grew up on a mixed farming operation near Kinsella, Alberta, where I saw firsthand how quickly weather and stress could change the outcome of a crop. That experience, combined with my Ph.D. training in Plant Developmental Biology at the University of Calgary, has shaped my perspective on agriculture: science and farming work best when they work together. At AgGene, the company I now lead, our goal is simple—to develop crop traits that make grain farming more resilient and profitable.

Plant breeding has always played a critical role in Canadian agriculture, delivering higher yields, stronger disease resistance, and varieties adapted to prairie conditions. Breeders have focused on selecting agronomic traits that improve productivity and create value for both farmers and end-use markets. But some traits—especially those tied to stress tolerance or seed quality—are complex, hard to isolate, or missing from the available germplasm sources. This is where targeted trait development comes in. By uncovering new sources of genetic variation and pinpointing specific improvements, trait development provides breeders with additional tools to build varieties that address today's challenges and capture tomorrow's opportunities.

Canola Stress Traits: Protecting Yield and Profitability

Canola is the prairie's most important cash crop, but it is also highly sensitive to weather extremes. Drought during flowering and pod development can reduce yields by roughly one-third in many environments. Heat is equally damaging: even a short period of high temperatures at flowering can cut yields by over 30% (Elferjani & Soolanayakanahally, 2018; Canola Council of Canada, 2020). These stresses don't just lower bushels per acre—they also shrink seed size and reduce oil and protein levels, which together chip away at crop value. For farmers, fields that look promising in June can quickly underperform by harvest if July heat or late-season dryness sets in.

To address these challenges, AgGene is advancing new stress-tolerance traits through two complementary approaches:

- **Gene Editing** – We focus on pathways that influence maturity, reproductive success, and stress responses. Editing the canola DNA blueprint allows us to test whether changes in these systems help canola maintain seed set and pod fill under stressful conditions. Once validated, these genetic traits can move into elite breeding programs.
- **Stress-Selection Screens** – We also use mutagenesis to create genetically diverse canola strains, then expose them to heat or drought. Plants that continue to flower, set pods, and produce seed under these pressures are selected as “winners.” Because these are conventional variants, they can move quickly into breeding programs and remain compatible with non-GMO and organic markets.

The goal is to steadily reduce the economic impact of stress. Even modest improvements in tolerance—such as maintaining yield when other fields are losing 10–15%—can make a meaningful difference for growers. Over time, building stress-resilient traits into prairie canola varieties will provide farmers with greater yield stability and help Canada maintain its position in global oilseed markets.

Pulse Traits: Opening Premium Markets

Peas are a key backbone of Canadian pulse production and a cornerstone of the country's plant protein industry. Chickpeas, while grown on fewer acres, are also an important part of the market with potential for growth. Despite their importance, pulses face challenges that limit their ability to capture full value. Protein levels can fluctuate with growing conditions and geography, making it difficult for processors to consistently meet specifications. At the same time, secondary metabolites and other compounds in the seed can contribute to bitterness or reduce functionality, lowering the appeal of pulse ingredients in food applications. These quality issues often push pulses into bulk commodity markets rather than higher-value, identity-preserved markets.

AgGene is addressing these challenges using mutagenesis, a conventional breeding tool that creates genetic diversity and allows us to identify rare variants that produce desirable traits. Our focus includes:

- **Protein Stability** – Developing varieties that maintain protein content more consistently across diverse geographic regions. This can improve fractionation efficiency, reduce variability for ingredient processors, and strengthen Canada's position in the global protein market.

- **Improved Taste and Functionality** – Selecting variants with reduced levels of undesirable compounds, resulting in pulses with a milder flavour profile and better performance in foods such as dairy alternatives, protein powders, and snacks.

By aligning pulse genetics with the needs of processors and consumers, these traits can help shift Canadian pulses away from bulk commodity markets and toward premium, identity-preserved supply chains. For farmers, that means new opportunities for stronger contracts, price premiums, and a more profitable role in the expanding global protein economy.

Conclusion

Traits are not a replacement for plant breeding—they expand the breeder's toolbox with new genetic options. By combining traditional breeding expertise with targeted trait development, we can deliver varieties that are more resilient in the field and more valuable in the marketplace. For canola, that means protecting yield and quality from the stresses of heat and drought. For pulses, it means improving protein stability and flavour to unlock new premium opportunities. By investing in trait innovation today, we can ensure that farmers have the tools they need to manage risk, capture value, and remain leaders in global grain and protein markets.

References

**Prepared by Logan Skori, Ph.D.
CEO/Co-Founder
AgGene Inc.**

Elferjani, R., & Soolanayakanahally, R. (2018). Canola responses to drought, heat, and combined stress: Effects on physiomorphological traits and yield. *Frontiers in Plant Science*, 9, 1224. <https://doi.org/10.3389/fpls.2018.01224>

Canola Council of Canada. (2020). Can we heat-proof canola? Canola Watch – Fundamentals. Retrieved from: <https://www.canolacouncil.org/canola-watch/fundamentals/can-we-heat-proof-canola/>

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ZOOM WEBINAR GRAIN AERATION MANAGEMENT FOR LONG TERM STORAGE



Dr Chandra Singh

Dr. Chandra Singh, RDAR Research Chair and Director of the Advanced Post-harvest Technology Centre at Lethbridge Polytechnic, is advancing Alberta agriculture through innovative technologies that reduce crop losses and improve sustainability. He leads the development of cost-effective, AI-assisted crop testing methods that deliver fast, accurate, and non-destructive quality assessment. His groundbreaking work recently earned him the prestigious John Ogilvie Research Innovation Award, recognizing his national leadership in agricultural research.

Topics to be discussed include:

- Importance of aeration in grain storage
- Key principles of aeration systems
- Moisture migration in bins
- Strategies for long-term storage
- Technology and sensors in aeration
- Common storage challenges & solutions
- Cost-effective aeration practices



NOVEMBER 4

11 AM MDT

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ZOOM WEBINAR POST HARVEST SOIL TESTING



Greg Patterson

Greg Patterson has been working in agriculture and an advocate for best agriculture practices and sustainability for over 35 years. He has strong ties in the Canadian agriculture community as the founder of **A&L Canada Laboratories**, the largest full-service agriculture, environmental, cannabis and plant disease laboratory in Canada.

Topics Covered:

- Understanding variability in soils and its impact on fertility management
- Efficient and economical soil testing methods to address variability
- Site-specific sampling strategies for variable rate applications
- Interpreting soil test results for informed decision-making
- Overview of A&L's unique soil test features and recommendations



NOVEMBER 14

11 AM MDT

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UPCOMING EVENTS

Event	Date	Click On the Link to Register
Water on the Land: Managing Wetlands for Farm & Community Resilience	22nd October 10 AM MDT	https://lp.constantcontactpages.com/ev/reg/46u6vbw
Grain aeration management for long term storage Webinar	4th November 11 AM MDT	https://us06web.zoom.us/webinar/register/WN_cwbUQ5TuS_OyI9dobN4Rjw
Post Harvest Soil Testing Webinar	14th November 11 AM MDT	https://us06web.zoom.us/webinar/register/WN_5gWnFvCERVeqzKEOfb0qZW

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