



THERE'S NO SILVER BULLET

Researchers advance
and diseases adapt
— meanwhile,
progress is made



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Looking for information on disease, pest and weed management?

Check out our library of barley production resources at BarleyBin.ca or subscribe to our monthly e-newsletter!

A look ahead for barley producers

As we wrap up another harvest season, I'd like to take a moment to reflect on the year and look at what's ahead for Saskatchewan's barley producers. We've seen steady advancements, thanks to a combination of research, collaboration and the dedication of farmers across our province. Our commitment at SaskBarley remains focused on supporting your success, whether you're growing for feed, food, or malt.

One key area of focus for SaskBarley is research. From exploring new barley varieties to understanding the best ways to manage inputs, we're always working to provide farmers with the information they need to make decisions that improve both their yields and profitability. For example, our Enhanced Agronomy Project continues to put emerging varieties through rigorous testing. We're trialing varieties like CDC Durango and AB Wrangler under different nitrogen rates and with and without plant growth



By pooling resources and collaborating with like-minded partners, we are gaining valuable insights, improving communication with government bodies, and strengthening ties within the sector.

regulators to help find the best fit for farmers across Saskatchewan. With results expected in the coming year, we aim to offer clear guidance for anyone looking to optimize their crop management ([learn more on page 14](#)).

At the national level, SaskBarley's memberships in industry organizations allow us to amplify our advocacy efforts. By pooling resources and collaborating with like-minded partners, we are gaining valuable insights, improving communication with government bodies, and strengthening ties within the sector. Our new strategic plan has shifted our 'Advocacy' pillar to help us better strengthen our relationships across the barley value chain and leverage the collective power of the organizations we're a part of.

Through these collaborations, we're working to ensure that farmers' voices are heard and their interests are prioritized.

On the global stage, the barley industry continues to

evolve, and we're seeing shifts in demand for malt barley varieties. Staying competitive in these markets requires a proactive approach, and SaskBarley participated in an outgoing mission to China and hosted a delegation of international malt buyers in Saskatoon ([learn more on page 8](#)).

As we move forward, I encourage all producers to stay connected with SaskBarley, join us at our winter events — like BarleyBin Live in Nipawin on Dec. 5— and continue to share your feedback. Together, we can strengthen the competitiveness of Saskatchewan barley and ensure it remains a cornerstone of sustainable agriculture, in Canada, and around the world.

Cody Glenn
Chair

SaskBarley
DEVELOPMENT COMMISSION 



PROGRESS THROUGH PERSISTENCE

by Delaney Seiferling

Freelance writer

Researchers lead the charge against evolving barley diseases, blending decades of experience with new technologies to protect Western Canadian crops

When it comes to studying ways to manage and prevent barley diseases in western Canada, there's always more work to do.

And that's OK for research scientist James Tucker because at the same time, he says, we're also slowly making progress.

Tucker started working at the Brandon Research and Development Centre 25 years ago, initially focused on finding solutions to fusarium head blight (FHB), which was a growing problem for Western Canadian barley growers at the time.

Since then, several new varieties have been released with some levels of resistance to the disease, which has helped to combat FHB — a disease that has cost Canadian farmers millions of dollars in yield losses.

"We've made gains, our efforts have paid off," he says.

But the work continues.

In his current role, managing the barley genomics program, Tucker continues to look for new sources of resistance to FHB, as well as to the other common diseases that plague the western Canadian barley crop, including

spot blotch, net blotch, scald and stem rust.

Although the degree to which these diseases affect crops each year varies greatly, based on weather and other factors, the sad fact is that they're likely not going away, Tucker says.

"Breeders have a lot to do," Tucker says. "There are seven different major diseases, and fusarium has really changed a lot -- it's very difficult for the breeders because resistance is not based on a single gene."

Despite the major challenges that come with managing plant diseases, Tucker remains optimistic, for a few reasons.

First of all, he is one of several experienced scientists across the prairies committed to helping producers manage and prevent these potentially devastating diseases in their barley crops.

Second, although the work they do is slow and tedious by nature, there have been several small wins for the research community over the last several decades — a trend he expects will continue.

"There's no silver bullet, but things have progressively gotten better."

An integrated approach

For Dr. Kelly Turkington, who has been working as a plant pathologist for four decades, one of the greatest achievements he has seen within the barley research world is a shift towards supporting a more integrated approach to disease and crop management.

When he first started working in the barley breeding program at Alberta Agriculture's Field Crop Development Center in 1994, the focus was mainly on screening for disease (primarily scald, which was most prominent in Alberta at the time).

He later went to work for Agriculture and Agri-Food Canada's Lacombe Research and Development Centre.

But having grown up on a grain farm in Saskatchewan, Turkington had a personal mission to provide growers with practical, agronomic and integrated solutions for disease management.

He spent decades leading and supporting research to generate these practical solutions, looking at how agronomic factors such as tillage systems, crop rotation, seeding practices, fertilizer



use and variety choice affect disease levels and overall crop quality in barley.

One topic of particular interest to him is determining optimal practices for fungicide and herbicide use to manage the disease in barley since application differs from wheat.

The work to date has confirmed that timing is key, but Turkington believes that there is still much to learn, which is why he's currently working with the next generation of scientists to generate better guidance for growers on the topic.

In the meantime, the knowledge that has been generated through decades of research has impacted the way prairie growers manage disease in barley crops, says Randy Kutcher, a plant pathologist at the University of Saskatchewan who specializes in leaf diseases.

"I think we are better at managing some of these diseases than we used to be. Growers know the importance of rotation. And we've got effective fungicides, we've got improved varieties. I think you can count those as wins."

Monitoring emerging threats

The job of plant pathologists like Turkington and Kutcher, is to study the reaction of plants to pathogens and determine why some genotypes of plants are more susceptible to disease infection while others are resistant.

But another important job of an applied pathologist like Kutcher is monitoring trends in pathogens and determining when action is needed.

For example, he has been following the patterns of bacterial leaf streak (BLS), which has become an issue of concern for Saskatchewan growers in recent years.

"It's been around forever, but it never seemed to be a problem," Kutcher says. "But it seems to have taken on a life of its own these last ten years."

Kutcher is currently leading longer-term research initiatives to better understand how BLS affects crops and how growers can protect themselves from it. Since this research started,

seed tests have been developed to detect the disease.

"We're trying to give producers practical answers," Kutcher says.

The search for germplasm with resistance to the disease is also underway, Kutcher says, with potential lines available south of the border, where BLS has been a significant issue for much longer.

And although it might still be a while before there are resistant varieties available, Kutcher says we're on the right track.

"I think we're starting to answer some of the questions growers and agronomists are asking about BLS. We have four years' worth of data and experience we didn't have four years ago."

He also believes that resistant varieties could be available in the next decade, alongside other management tools such as portable seed tests and new bactericides.

Continues on next page

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Disease surveillance

Another positive development for barley disease research in Turkington's mind is the strength and scope of surveillance programs across Western Canada.

For decades he has been working with collaborators in Manitoba, Saskatchewan and Alberta to monitor the levels of ongoing barley diseases and the emergence of new ones.

"Diseases are not static, they adapt, whether to host resistant genes, fungicide actives, cropping practices, etc. Keeping

on top of diseases and their effective management requires ongoing long-term research related to the issues out there," Turkington says.

Surveillance studies allow researchers to better understand the characteristics, variations, disease resistance and fungicide sensitivities of pathogens that threaten barley crops each year. This information is then used to determine when we need to escalate our response (like in the case of BLS) through increased research on management practices, pathogen characteristics and variation and breeding activities.

"If we didn't have that information, we would be working blind in terms of the disease issues affecting prairie barley crops," he says. "Moreover, we wouldn't be able to foresee potential shifts in existing diseases or the emergence of new issues."

"Surveying is so very, very important that I can't emphasize that enough to producers."

Breeding advancements

Most producers know that breeding disease resistance into new barley varieties is time consuming and tedious work.

But they may not also realize that the same is true for the pre-breeding work done by people like Tucker, who generally spends three seasons examining his data to validate it.

"It is similar to a breeding program in that lines are advanced for further testing and selected," he says. "I keep screening them over and over 'till I'm quite sure they actually are resistant."

At that point, his materials would be passed onto barley breeders across western Canada, and the actual breeding process begins.

Photos courtesy Kelly Turkington, Agriculture & Agri-Food Canada



As barley flowers in the boot, optimal timing of fungicide for FHB control is when the heads on the main stem are fully emerged. Applying fungicide before all the heads emerge will result in those heads not being protected. In contrast, wheat heads emerge and then flower, so the optimal timing begins during flowering.

Join SaskBarley at our winter events

GRADE SCHOOL 2024

Nov. 13 — Weyburn

Nov. 14 — Tisdale

Join SaskBarley, SaskOilseeds, Saskatchewan Pulse Growers and Sask Wheat for Grade School 2024. Learn about common grading factors for each crop, watch grading demonstrations with the Canadian Grain Commission and more.

BARLEYBIN LIVE AT THE DAM SMOKEHOUSE

Dec. 5, 6 – 9 PM — Nipawin

SaskBarley's BarleyBin Live is coming to The Dam Smokehouse in Nipawin for an unforgettable evening of food, drinks, and deep discussions on all things barley. This event is the perfect opportunity to engage with barley breeders, pathologists, and agronomists, all while enjoying world-class BBQ in an intimate setting.

SASK CROPS FORUM AND SASKBARLEY AGM

Jan. 14 – 15, 2025 at the Western Development Museum, Saskatoon, SK

The Sask Crops Forum is bringing a dynamic program including four keynote sessions and plenty of networking opportunities alongside the AGMs for SaskBarley, SaskOilseeds, Saskatchewan Pulse Growers and Sask Wheat.

SASKBARLEY AGM AGENDA

Tuesday, Jan. 14 at 2 PM

1. Call to order
2. Approval of agenda
3. Review and approve minutes of the last AGM
4. Business arising from the minutes
5. Report from organization
6. Auditor's report
7. Appointment of auditor for 2024/2025
8. Call for resolutions
9. New business
10. Adjournment

MOTIONS TO BE PRESENTED

1. That the agenda for the 2025 AGM be approved as presented
2. That the minutes of the 2024 AGM be approved as presented
3. That the report from the organization be approved as presented
4. That the audited statements for the year ended July 31, 2024, be approved as presented
5. That SaskBarley appoint the auditor for the year ending July 31, 2025
6. Resolutions
7. To adjourn the 2025 AGM

FIND A TOP NOTCH FARMING MEETING NEAR YOU!

Feb. 4 – Hudson Bay

Feb. 5 – Melfort

Feb. 11 – Moosomin

Feb. 12 – Weyburn

Mark your calendar and plan to join SaskBarley and SaskOilseeds this winter for one of our rural extension meetings.

Learn more at SaskBarley.com/Events

“Maybe in 20 years, it’ll be a variety, but it’s stuff that I probably won’t ever see the impact from directly,” Tucker says.

But despite the long-term nature of this process, there have been some major wins for the breeding community in recent decades.

FHB resistance has increased in barley varieties released in the last decade, with two-row varieties such as AAC Connect, AB BrewNet and CDC PlatinumStar now offering moderate levels of resistance.

“There are some payoffs,” Tucker says.

“But if you’re the type of person who wants results in two weeks, this job isn’t quite like that.”

New technology

One of the major focuses for Tucker in recent years has been adopting newer technology into his genomics program to drive efficiency and shave time off the breeding and pre-breeding processes.

For example, he has adopted “gene chip” technology, which allows him to detect DNA sequences and identify mutations much faster and more efficiently than ever before.

“We can screen for thousands of markers all at once.”

He’s also working with newer technologies for genomic predictions, which allow him to saturate genomes with markers and then link each marker to a trait.

“It’s kind of like shot-gunning the whole barley genome. If there’s a gene of interest, then it’s going to be connected to a marker somehow.”

Quantitative genetics also allow researchers to hone-in on continuous variation traits that are extremely difficult to tease out under traditional breeding practices.

Tucker says his program will likely also adopt new forms of image-sensing and data-capture technologies in the near future to help automate processes.

“All these technologies are becoming cheaper now,” he says. “Slowly we’re moving towards a more modern approach.”

Going forward, Turkington believes the use of these types of newer molecular tools will help boost and complement

research capacity and efficiencies in studying pathogen variation and virulence and testing fungicide sensitivities.

He also believes there is lots to learn about combining precision agriculture with variable fungicide applications.

“We need to add to our foundation of knowledge and complement what farmers and consultants are doing while addressing their future needs.”

The future

The reality is that most of the common barley diseases aren’t going away and climate change will likely only cause new challenges going forward, Tucker says.

“The pathogens are changing but the environment’s changing as well. The pathogens that like the warmer temperatures are probably going to flourish.”

But the good news is that our barley disease research community has decades of experience staying on top of new and emerging threats, slowly and carefully breeding resistance, and uncovering new tools and practices for growers to control the most urgent threats.

Added to that, many veteran barley disease researchers such as Kutcher and Turkington are dedicated to training the next generation of researchers to continue on with this work.

“We have great people working on barley and pest management related research,” Turkington says. “And it’s a very collaborative community that I have been so very fortunate to be part of as I look towards finishing my career.”

For Tucker, the excitement comes from also knowing there are still so many opportunities ahead for the barley disease research community.

“There are lots of new tools we have access to. Since when I started doing genomics work, there are already ways to do things more efficiently, cheaper,” he says.

“You still have to do the initial field work to connect the real world to the genomics to make the prediction but we’re going to be able to capitalize on that. We can use these new technologies to defeat these really challenging diseases.” 🍷

Forging stronger ties

How Canadian barley is capturing attention in the global brewing industry

by Canadian Malting Barley Technical Centre

As the global brewing industry evolves, Canada faces the challenge of ensuring its barley stands out in key markets like China, which accounts for 60% of global malting barley trade. With Australia back in the Chinese market, it's crucial to highlight the value of Canadian malting barley to these customers. The 2024 Canada-China Barley Seminar, held in Qingdao on June 20th, was a strategic step toward this goal.

Hosted by the Canadian Malting Barley Technical Centre (CMBTC) and Tsingtao Brewery Group, the seminar aimed to strengthen Canada's reputation in China, highlight its top-quality barley, and build stronger ties with key players in the Chinese brewing industry. Tsingtao, one of China's largest brewers and a regular buyer of Canadian barley, imports 300 - 400 thousand tonnes annually.

BUILDING CONNECTIONS AND SHOWCASING QUALITY

The seminar aimed to strengthen ties between Canada's barley industry and Chinese brewers while promoting Canada's unique barley varieties and farming practices. Chinese brewers, known for their focus on quality beer, are showing more interest in Canadian barley for its distinct flavour. About 25-30% of the malt in Chinese beers comes from Canadian barley, with even higher percentages in premium brands.

Dr. Aaron Beattie from the Crop Development Centre shared the latest in Canadian plant breeding, while Dr. Yueshu Li showcased new barley varieties. Chinese brewers were highly interested, noting the importance of quality and consistency in brewing premium beer.



Representatives of the Canadian barley value-chain pose in front of the Tsingtao Brewery during the 2024 Canada-China Barley Seminar in Qingdao, China in June. Photo courtesy the Canadian Malting Barley Technical Centre

SUSTAINABILITY AND INNOVATION LEAD THE WAY

Cody Glenn, Chair of SaskBarley, discussed the benefits of growing barley in Canada, while Vice-Chair Matt Enns focused on sustainable practices in Western Canada. Their presentations highlighted Canada's commitment to responsible agriculture, which is increasingly important to international partners.

The seminar included a visit to Hyaline Malting in Yantai, where the delegation observed how Canadian malting barley is used in local brewing. This visit highlighted the potential for ongoing collaboration, as Hyaline is a major player in the Chinese malting industry and a strong supporter of Canadian barley, actively experimenting with new varieties.

SHOWCASING BARLEY AT HOME

The seminar set the stage for ongoing collaboration to make Canadian barley a top choice in the global brewing market. The excitement from these discussions carried over to the 2024 New Crop Tour, co-organized

by CMBTC and SaskBarley in August in Saskatoon, SK.

The tour welcomed international guests from key markets like China, Japan, Brazil, and the United States, offering them a firsthand look at the quality and innovation of Canadian barley production.

Over two days, guests visited farms in central Saskatchewan to explore different barley varieties and production methods. Highlights included a visit to Prairie Malt in Biggar to learn about the malting process and a tour of the Crop Development Centre (CDC) to see test plots and hear about barley breeding advancements.

These visits allowed international guests to connect directly with farmers, deepening their appreciation for the dedication involved in producing high-quality barley and positioning Canada well in a changing global trade landscape.

For Canada, strengthening ties with maltsters and brewers in markets like China and Japan is essential for maintaining and expanding our global market presence—one barley grain at a time. 🌾

Members only

How SaskBarley leverages and drives value for Saskatchewan barley farmers through strategic memberships

by **Delaney Seiferling**
Freelance writer

Earlier this year, SaskBarley joined Western Crop Innovations (WCI), a not-for-profit research organization in Lacombe, AB, focused on breeding new barley varieties for western Canadian producers.

This decision was a big one for SaskBarley, says Board Chair Cody Glenn, as Tier 1 WCI membership is valued at \$50,000 per year of farmers' check-off dollars.

But it also made sense from a strategic, and value driven perspective.

"There are currently only two and a half public barley breeders in Western Canada, and one of them is at WCI," he says. "If we lost that, it would be a huge loss to the barley industry."

WCI, formerly the Field Crop Development Centre, has over 50 years of barley breeding experience. "They've developed many strong varieties, including five I grow myself," Glenn adds.

WCI is one of several organizations SaskBarley supports through funding or representation. Each membership is carefully researched and discussed by the board before being finalized, Glenn says.

"Each choice we make needs to benefit the producer. If an organization's goals align with ours and offer collaboration opportunities, we'll consider supporting it to maximize those benefits."

"SaskBarley is lean organization with a few dedicated staff that do a fantastic job managing our limited resources," says Glenn. "We can't accomplish all our goals in house. The board has been very good at leveraging partnerships with industry

"There are currently only two and a half public barley breeders in Western Canada altogether, and one of them is at WCI. If we lost that, it would be a huge loss to the barley industry."

Cody Glenn
Board chair

organizations that have the staff and resources to meet our objectives."

The concept of value is always tied to SaskBarley's strategic priorities, Glenn says, which include research, market development, communications and extension.

As part of the strategic planning process undertaken this past summer, SaskBarley has replaced the advocacy pillar of their mandate with a broader

directive to leverage sector resources and relationships on behalf of barley producers.

Aware that barley is a mid-sized crop and part of a producer's larger rotation, SaskBarley focuses on using resources strategically, avoiding duplicating efforts like advocacy, which is already handled by the organizations they support, Glenn says.

Each membership SaskBarley holds helps advance its goals in key areas while expanding its network, knowledge, and ability to serve Saskatchewan producers, Glenn adds.

"The Board that we have now is absolutely a phenomenal group, because they bring so much outside perspective, whether from sitting on these external committees, or from their personal lives and experience. It makes for very good conversation and enhances our ability to make value-based decisions."

Key achievements from SaskBarley's member organizations are also included in the organization's annual report each year, available at saskbarley.com/strategic-memberships.

SASKBARLEY SUPPORTS:

RESEARCH

Canadian Barley Research Coalition



Prairie Recommending Committee for Oats and Barley

Western Crop Innovations



Saskatchewan Variety Performance Group

For a full description of each organization and how SaskBarley is leveraging these relationships and resources to improve the profitability of Saskatchewan barley producers, please visit SaskBarley.com.

ADVOCACY

Canada Grains Council



Cereals Canada



Farm & Food Care Saskatchewan



Agriculture in the Classroom



MARKET DEVELOPMENT

Brewing and Malting Barley Research Institute



Canadian Malting Barley Technical Centre



Plant breeders' rights

Balancing innovation with operational freedom

by **Matt McIntosh**
Freelance writer

Breeding barley and other cereals has generally remained in the public domain, in part due to acreage, but also due to the inability for breeders to collect a return on their investment. Commissions like SaskBarley have been investing heavily in plant breeding at public institutions to ensure variety development continues to benefit farmers.

Anthony Parker, Commissioner of the Canadian Food Inspection Agency's Plant Breeders' Rights Office, and Stuart Smyth, Chair of Agri-Food Innovation at the University of Saskatchewan, emphasize the need to strike a balance

between protecting farmers' operational freedom and encouraging innovation in cereal breeding across both public and private sectors.

PLANT BREEDERS' RIGHTS

The Plant Breeders' Rights Act plays an important role in Canada's crop innovation story.

Canada is a member of the Union for the Protection of the New Varieties of Plants (UPOV) – an international body that safeguards plant breeders' rights and promotes the development of new varieties. Since joining UPOV, Canada amended its legislation in 2015 to align with the UPOV 1991 framework, which introduced several changes aimed at modernizing plant variety protections.

"UPOV has been around since the 1960s offering this protection for countries. Canada was interested as

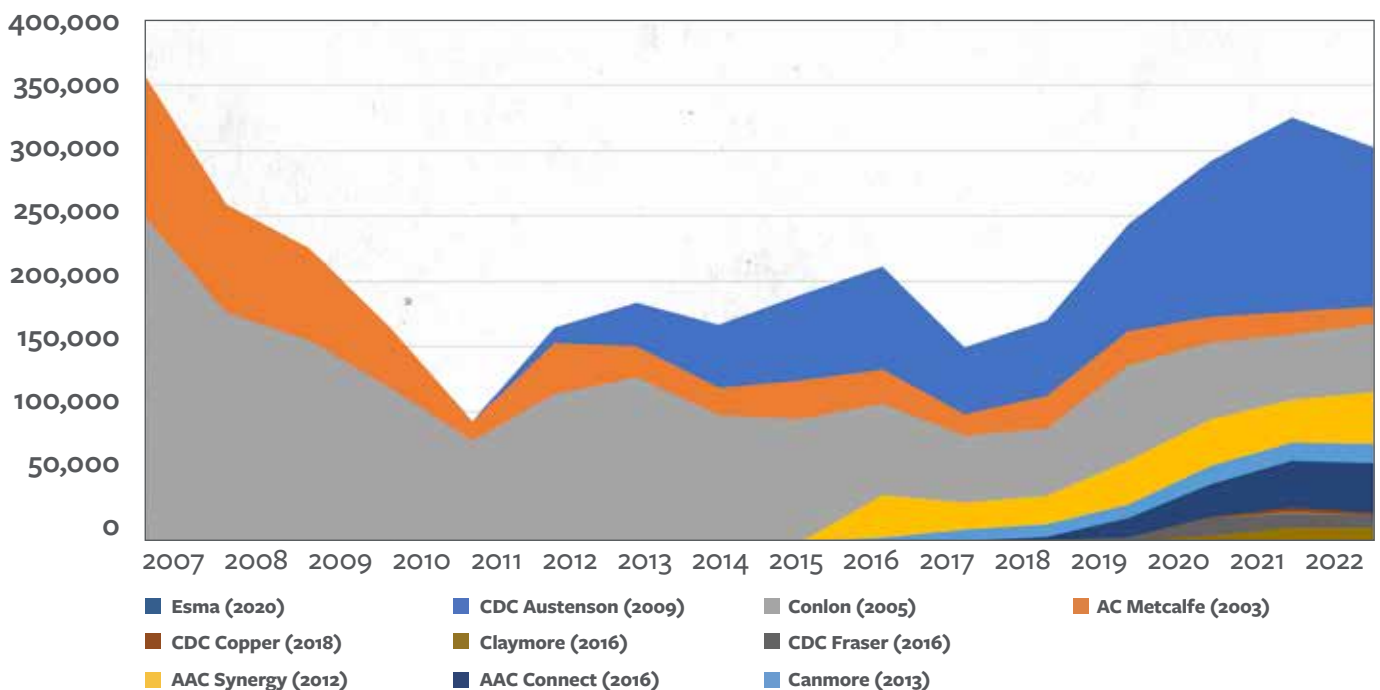
far back as the 1970s, but it's been controversial. Farmers are nervous it will restrict their freedoms," says Parker, referring to the freedom to save and replant seed without having to pay additional royalties to the variety developer. He subsequently considers what future trade-offs might be possible, or desired, by different parties within the agriculture sector.

When considering the balance between the farmers' freedom to save seed and the desire to access new innovations, Parker asks, "The question is, do we have the willingness to make this trade-off?"

Smyth raises the same question, saying the conversations must be had between farmers and those who are, or could, develop plant varieties those same farmers might want in the future.

"If we're putting more money into crop development, there will be new traits

Barley varieties by acreage — 2007-2022



Graphics courtesy Stewart Smyth

that have significantly improved drought tolerance, disease resistance... Academics and researchers need to better explain the longer-term benefits.”

While public investments through government programs and producer levies are vital, these investments are made in addition to the collection of royalties on the sale of certified seed.

Parker questions whether current funding models are sufficient, suggesting that adopting practices from other countries, such as small per-acre royalty payments on saved seed, could help stabilize and support breeding programs.

Fundamentally, Parker says the public sector needs to define its long-term role in plant breeding. If Agriculture Agri-Food Canada (AAFC) invests dollars back in breeding programs, it’s money well spent. If not, other systems need to be considered to fill the space.

“The public and private sector, commodity groups, and farm organizations need to all discuss what we want the future to look like, and establish alignment,” says Parker, adding an “investor mindset” is needed to drive lasting change.

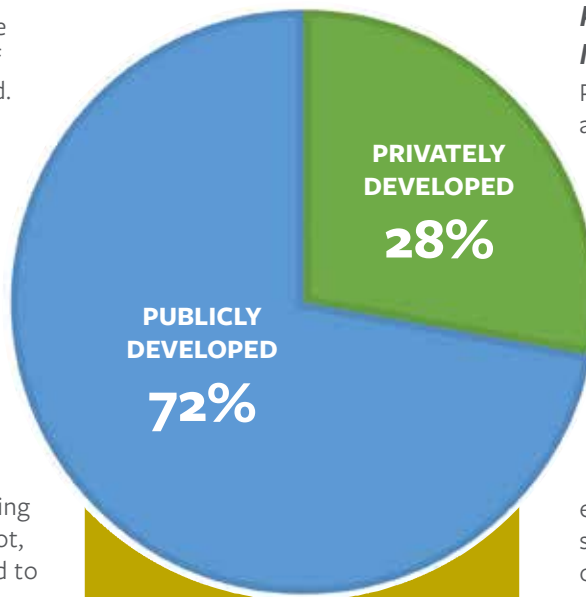
BARLEY INNOVATION

There is an investor mindset in the barley sector. According to Mitchell Japp, Research and Extension Manager for SaskBarley, a recent study commissioned by the commodity group revealed farmer-funded investments in barley breeding programs have yielded a 26:1 ratio in value — that is, \$26 in value to growers for every \$1 spent.

“That’s a pretty positive result,” says Japp, adding other studies have highlighted an even higher return-on-investment.

Developments in malt barley varieties have been particularly notable. The variety AAC Synergy, for example, features better disease resistance, and set yield records bringing it in line with yield performance of top feed barley varieties. Varieties developed since AAC Synergy

Commercialized barley varieties 2012-2022



“If we’re putting more money into crop development, there will be new traits that have been significantly improved drought tolerance, disease resistance.”

Stuart Smyth
Chair, Agri-Food Innovation

continue to generate improvements that benefit farmers directly.

Specific ratios aside, the role of Plant Breeders’ Rights in enabling such returns is significant. SaskBarley’s investment in public breeding programs, alongside royalties from certified seed sales, helps maintain the cycle of innovation.

“Royalties are part of that structure. Plant Breeders’ Rights gives a breeder some control over their intellectual property, while allowing farmers flexibility,” says Japp. He adds that some royalties would still be collected in the

absence of the PBR framework.

“This system offers a balance between breeder rights and farmer freedoms—flexibility that other forms of intellectual property protection may not provide.”

PUBLIC DOLLARS STILL NEEDED

Private sector companies have played a role in cereals development, but the public sector continues to dominate the field. Indeed, 72% of all barley varieties commercialized from 2012 to 2022 originated from public breeding programs. And, when a valuable variety emerges, it often dominates the market for years or decades.

For Smyth, this highlights the need for better funding models. Changes to Plant Breeders’ Rights alone will not ensure the long-term growth of public sector cereal breeding. As the cost of research and innovation increases, additional public funding is needed to maintain momentum.

“Under various iterations of Growing Forward, used for a couple decades, the dollars going into the public sector have not increased. And inflation didn’t stop. We know everything costs more money. A 25 per cent reduction in funding, when you factor in inflation, means we’re doing less variety development than we were 20 years ago,” says Smyth.

“Governments in Canada really have not stepped up to the plate to try and ensure Canada can contribute to the sustainable development goals, to try and ensure we’re doing as much as we can.”

While Japp acknowledges the difficulty of gathering quantitative data on the changes in investment, he points to results published in two recent scientific studies, one commissioned by Agriculture and Agri-Food Canada, the other published in the Journal of Plant Breeding and Crop Science (Sutherland et al).

“While the results were mixed, the first report found that the 2015 PBR changes led to more investment in breeding. The other report showed that people are happy with the current level of protection under PBR.” 🌾

Generating high quality on-farm research results

How randomization and replication are the key to better decision making

by Mitchell Japp

Research & Extension Manager for SaskBarley

Producers endlessly evaluate different management practices for their farm. Whether trying a new crop protection product, selecting a different fertilizer source, or simply planting a new variety, a choice has to be made.

What factors into those decisions? How are the results evaluated? On-farm, field-scale research trials can facilitate better decision making by giving farmers real-world answers unique to their operations.

For example, how do you assess the performance of a new variety on your farm? Maybe you start with enough seed to plant a quarter section. And, after harvest, compare the yield from that quarter against the yield from other fields growing your current variety.

That's a fairly simplistic approach that provides some information about how a variety performs in your area, under your management. But be cautioned that the results from this type of comparison can be misleading.

The good news? With a little structure, good quality data can be generated on-farm.

AVOIDING THE PITFALLS OF VARIABILITY

Why would comparing one field to another generate misleading results? The amount of grain collected to compare against another field is substantial — however, when we look to make



SaskBarley launched the BarleyBin Field Lab in 2023 to generate high-quality on-farm research results with the collaboration of local farmers. Photo courtesy Kayla Slind, WARC.

comparisons to inform decisions, such as investing in a new variety for the whole farm, we need to control as many variables as possible.

In the example of comparing two varieties across separate fields, there are several variables that can skew the results.

- Were they seeded on the same day? With the same equipment? At the same speed?
- Was the crop rotation and management history the same? Was the stubble height the same?
- What are the differences in disease or insect pressure?
- Yield potential of the fields compared may be different.
- Precipitation varies over small areas.

All of those factors can contribute to yield differences between the fields that, in a simplistic approach, would be attributed to differences between the varieties – the one variable we were trying to understand.

Strip trials can lead to similar pitfalls. When applying fungicide, or another product, you may occasionally leave one or more passes without treatment to get an idea if the application worked or not.

Strip trials are run within the same field, so the variables that could affect results are different than between fields, but they still exist.

- Soil variability within a field
- Location of the check strip (headlands, or land influenced by history such as a blow dirt ridge or old farmyard)
- Slope position

Combine operators who are watching their yield monitors closely know how much yield can vary as they move from one end of the field to the other. When comparing a check strip to the rest of the field, can we be confident that yield differences are due to the treatment we applied and not some other factor?

The answer? If that check strip is replicated and randomized, then yes!

RANDOMIZATION AND REPLICATION GENERATE HIGH QUALITY DATA

Randomization and replication are what separate the barley from the chaff when it comes to on-farm research.

Replication is important because it increases the number of comparisons we make and allows us to understand the variability within a field. If a field had no variability, every pass collected would yield the same for the same treatment. Yet, this never happens.

Statistics is used to determine if the lack of consistency observed between replications is most likely due to natural variability or the applied treatment. Indian Head Agriculture Research Foundation (IHARF) has a simple statistical tool to guide decisions on on-farm research trial results. **Find it at iharf.ca/on-farm-tool.**

Two replicates are enough to generate a statistical comparison, but four are needed to be confident in the results.

If replication gives enough data to create statistical comparisons, what is randomization for? Randomizing treatments within each replicate (one complete set of treatments) is necessary to prevent data from being skewed by any

underlying gradients.

In Figure 1, a simple two-treatment experiment comparing the addition of a management product (Treated) or not (Check). The treatments are placed in same relative position each time they are replicated. But a gradient exists within this field that results in one end of the field being lower yielding than the other. Because of this gradient and the lack of randomization, the Check will yield higher than if the Check location was reversed with the Treatment. By applying a randomized arrangement of the treatments, this can be avoided and we can be confident in the results (see second figure).

Randomization and replication are the most critical factors to be more confident

and data collection as streamlined as possible.

IS A YIELD MONITOR GOOD ENOUGH?

A common question from trial participants is “Is a yield monitor good enough to collect data?”. Certainly, yield monitors can help compare relative performance of various treatments and varieties. However, unless well calibrated, the values are probably not reliable to share beyond your farm. For the most part, the trends observed can help you decide if the treatment was economical or not.

Trials conducted as part of the BarleyBin Field Lab are weighed using either a weigh wagon, or a grain cart with a scale

for more precise results. We then combine the data from across all trials within each protocol.

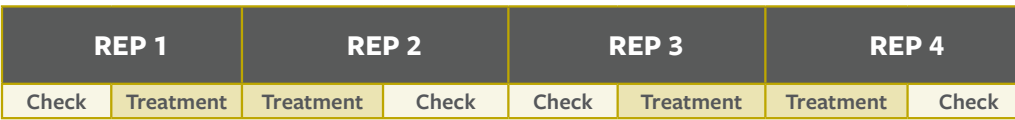
In addition to informing decisions on the farm it was generated from, the aggregated results are shared with farmers across the province.

Figure 1



Yield potential increases in direction of arrow. Check treatment benefits from gradient due to no randomization.

Figure 2



Yield potential increases in direction of arrow. Neither treatment benefits from gradient.

in data generated from research trials.


SaskBarley launched the BarleyBin Field Lab in 2023 to generate high-quality on-farm research results. This program is designed to model good practices for on-farm research and share the results generated by our own trials with farmers. Our protocols can be used by anyone to generate quality data at home.

SaskBarley partners with Saskatchewan Pulse Growers, SaskOilseeds and Sask Wheat, in our delivery of the on-farm research program and extension of its results. Western Applied Research Corporation (WARC) coordinates and leads the trials. Each participating farmer is partnered with an agronomist to make the trial establishment, management

WANT TO CONDUCT YOUR OWN QUALITY ON-FARM TRIALS?

SaskBarley will open applications for the 2025 BarleyBin Field Lab in late December. There’s been strong interest in the program so far, and we’re looking for farmers across Saskatchewan who want to generate and share answers to agronomic questions or test variety performance on their farms.

SaskBarley supports both agronomists and farmers to ensure quality results, and our research protocols are available to anyone interested.

To learn more about the program, visit SaskBarley.com/barley-bin-field-lab. 

Multiple choices: Putting barley's best to the test

With new barley varieties like CDC Durango and AB Wrangler, SaskBarley's Enhanced Agronomy Project is putting malt and feed options through their paces. From nitrogen rates to PGRs, researchers aim to uncover the best fit for farmers.

by Geoff Geddes

Freelance writer

Durango versus Wrangler sounds like a battle of the jeans, as well it should. SaskBarley's Enhanced Agronomy Project is all about finding the right fit for your farm. In collaboration with the East Central Research Foundation (ECRF) and Suncrest College, the current study is testing a pair of two row malt barley varieties – AAC Prairie and CDC Churchill - and the two row feed varieties CDC Durango and AB Wrangler. All lines will experience standard versus enhanced rates of N (nitrogen), “PGR (plant growth regulator) versus no PGR” and “fungicide versus no fungicide”.

Part of the value from these trials stems from the thoroughness of researchers. For 2024-25, they are using both standard and enhanced rates of N fertility (soil (0-24”) + added N], which will vary among locations based on historic yield. The sites fall into three groupings, with yield potential obtained from data provided by the Saskatchewan Crop Insurance Corporation (SCIC). Group 1 in Swift Current features low yield potential and 100 versus 125 lb N/ac. The mid-range Group 2 is situated in Indian Head and offers 120 versus 150 lb N/ac. Finally, Group 3 in Yorkton and Melfort boasts high yield potential with 130 versus 162 lb N/ac.

All sites are being fertilized with P and K levels so as not to be limiting, even for the

“PGRs seem to have a place in keeping barley standing during a wet year when yield potential is high,” says Hall. “I don’t advise using them in a dry year, as they likely won’t be economical for you, and could even push yields in the opposite direction in extreme cases.”

Mike Hall

Suncrest College

high N rate, and all will receive added N.

For those seeking the devilish details, the trials are applying the PGR Moddus at stem elongation, and the fungicide will be either Trivapro or Nexicor, applied at flag leaf.

“These varieties in the current study are very new and are anticipated to become popular in the future,” says Mike Hall, research coordinator with the ECRF. “If they do see widespread uptake, the trials will provide data to inform farmer decisions.”

A big focus of these trials over the years has been the differing responses of barley lines to inputs such as N and PGRs. For

example, a recent project compared AC Metcalfe and AAC Synergy on a number of fronts.

“AAC Synergy is much better yielding and has a superior disease package,” says Hall. “Does this mean it should be managed differently for maximum results?”

PUTTING CROPS OUT TO PASTURE

Historically, maltsters have been slow to accept new barley varieties, finding ones they like and sticking to them over the years. Like humans, however, barley lines can get long in the tooth and lose their impact.

“Maltsters seem to be more readily accepting of newer varieties than they used to,” says Hall. “In the old days, an option like Harrington was preferred by maltsters for a long period, even though it had become a relatively poor variety to grow agronomically compared to newer lines at that time.”

The Harrington example underlines the need for current information on barley varieties. In the instance of AC Metcalfe versus AAC Synergy, a key question was whether newer malt barley varieties required more nitrogen than their predecessors. Synergy is 15% higher yielding than Metcalfe, and higher yield typically means lower protein. Upon testing, researchers found that an acceptable level of protein for malt (12.5% or below) was exceeded at a lower rate of N for Metcalfe compared to Synergy.

UNDER NEW MANAGEMENT

Another factor that has helped shape the current study was Hall's curiosity about whether feed and malt barley should be managed differently. In the earlier study, 3 different malt varieties - AAC Synergy, AAC Connect and CDC Fraser - were compared against 3 feed varieties, including CDC Austenson, Claymore and Oreana. As with the current study, these varieties were compared at standard and enhanced rates of N, with and without PGR and with and without fungicide.

"In the 2024 Crop Planning Guide from Saskatchewan Agriculture, they assume a feed barley yield of 86.4 bu/ac, with an N removal rate of 92 lb N/ac for the black soil zone," says Hall. "In contrast, the yield assumption is lower for malt barley at 70.1 bu/ac, with a lower N removal rate of 74 lb N/ac. Perhaps these assumptions were based on older data, when malt varieties were typically lower yielding than feed; however, the yields of newer malt varieties today are quite comparable to feed."

Studies led by Hall have found the yield response between newer malt and feed varieties are similar and that the most economic rate of N for malt usually occurs before 12.5% protein is exceeded.

"With this in mind, it follows that the most

economic rate of N will actually be lower for feed and not higher, since feed barley is usually worth less per bushel than malt barley," says Hall. "That said, I'm not telling malt growers to apply more N than they are comfortable with, as no one wants to be rejected for malt due to excessive grain protein."

The feed versus malt barley trials were conducted during dry conditions, so there was no benefit from applying fungicide. It should be noted, though, that the level of leaf disease was significantly higher for the feed varieties Oreana and Claymore.

"I would assume these varieties would have benefitted more from fungicide application if conditions had been more conducive for disease development," says Hall.

Also tested was the response to PGRs, which can sometimes serve as a critical piece of the barley puzzle.

"PGRs help to reduce crop height, so plants are less likely to lodge," says Brianne McInnes, operations manager of the Northeast Agriculture Research Foundation.

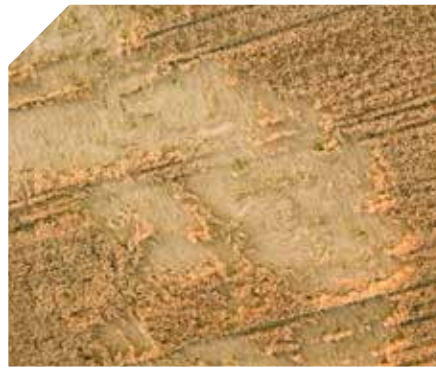
"By reducing crop height, PGRs often protect the yield and quality of barley, especially in a wet season when the crop is more likely to lodge. A standing crop is easier to combine, and often higher yielding than a lodged crop."

Thus far, researchers have seen little benefit from PGRs, thanks largely to a low incidence of lodging during the study. PGRs do appear to be more effective at reducing the height of malt barley varieties than their feed counterparts.

"PGRs seem to have a place in keeping barley standing during a wet year when yield potential is high," says Hall. "I don't advise using them in a dry year, as they likely won't be economical for you, and could even push yields in the opposite direction in extreme cases."

Just as farming itself is a gamble, SaskBarley's Enhanced Agronomy Project involves rolling the dice on which varieties will garner the most interest in the years to come. If all goes as planned, however, barley growers might just hit the jackpot. 🎲

Research trials at the ECRF in Yorkton, SK show less lodging when plant growth regulators (PGRs) are applied to barley to reduce crop height. Photos courtesy Mike Hall, ECRF and Suncrest College.



Driving barley innovation

SaskBarley invests more than \$3 million in research to improve agronomic practices, disease management, and market sustainability

by Mitchell Japp
Research & Extension Manager for SaskBarley

SaskBarley is committed to advancing barley production through strategic research investments, fostering innovation that benefits both farmers and the broader barley value chain. By investing in a wide range of research projects, SaskBarley addresses pressing agronomic, environmental, and market-related challenges, ensuring the long-term profitability and sustainability of the barley industry.

During the 2023-2024 fiscal year, SaskBarley has committed more than \$3.16 million to a variety of projects, reflecting its dedication to advancing barley production across Western Canada. These projects aim to enhance crop management, address disease resistance, and explore new agronomic practices, all while meeting the market's evolving demands for high-quality barley.

A key area of investment is the **Canadian Barley — Sustainably Growing** (Barley Cluster) projects, which is part of the National Cluster initiative through the Sustainable Canadian Agriculture Program. SaskBarley has committed over \$1.1 million to this five-

\$1.1 million

TOTAL SASKBARLEY RESEARCH INVESTMENT

\$3.16 million

over 24 projects across Western Canada over 5 years

year, \$9.6 million initiative, designed to support sustainable growth and research in barley. By collaborating with producers, private organizations, and Agriculture and Agri-Food Canada (AAFC), the Barley Cluster focuses on long-term success, exploring innovative solutions that will benefit farmers in years to come.

SaskBarley's funding also tackles significant agronomic issues. For instance, the **Improve Uniform Maturity in Barley** project, led by Dr. Hiroshi Kubota, focuses on enhancing nitrogen use efficiency and managing tiller growth to improve crop uniformity. This project is crucial for helping growers address inconsistent maturity, which can affect harvest timing and crop quality. SaskBarley has invested \$113,642 in this initiative.

\$114 thousand

In addition, the organization supports cutting-edge research into disease management. The **Catch Me if You Can** project, led by Dr. Randy Kutcher, aims to rapidly detect *Fusarium graminearum* and deoxynivalenol (DON) derivatives, which are harmful mycotoxins that can threaten barley quality. This research will provide crucial tools for monitoring and controlling mycotoxin contamination, ensuring safe, high-quality barley that meets market demands. SaskBarley's commitment to this project is \$114,934.

\$115 thousand

Furthermore, SaskBarley invests in projects that explore innovative planting practices, such as the **Critical Assessment of Ultra-Early Seeding** project, led by Drs. Ana Badea and Brian Beres which seeks to evaluate the risks and benefits of ultra-early seeding in barley.

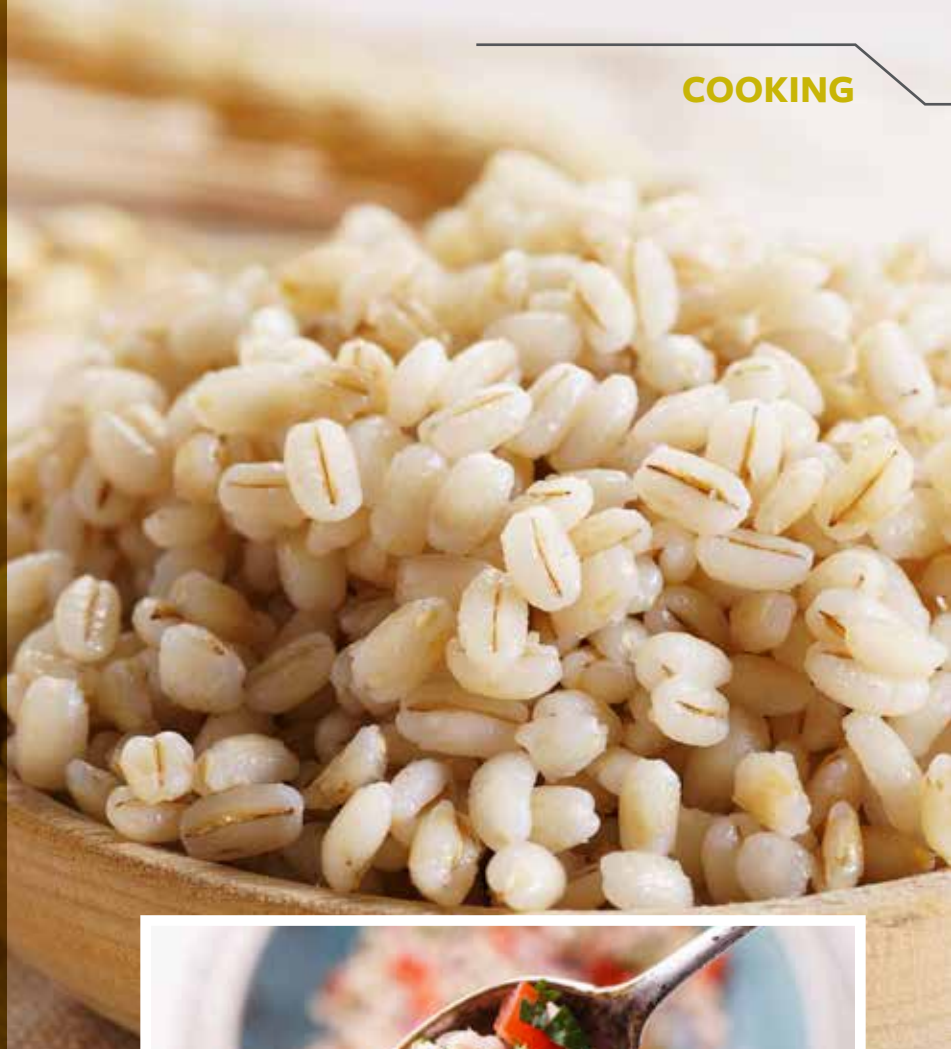
\$457 thousand

This approach could potentially extend the growing season, improve yields, and mitigate risk. SaskBarley has allocated \$456,751 to this initiative.

These investments demonstrate SaskBarley's proactive approach to supporting farmers and driving innovation and growth of this keystone crop. By addressing the challenges of disease resistance, agronomic efficiency, and market demands, SaskBarley is positioning the barley sector for success well into the future. 🌾

For a more detailed list of our current research projects, visit SaskBarley.com/Projects.

3 ways to cook and use barley



Barley salad. Photos courtesy CanadianFoodFocus.org.

by **Carol Harrison**

Freelance Writer for
CanadianFoodFocus.org

If you've never tried barley or you didn't like it at first, here's how to enjoy this delicious and hearty grain.

Barley is one of the most underrated foods. Many people shy away from this grain because they're not sure how to cook it, but barley's chewy texture, subtle nutty flavour and strong nutrition profile make it worth the effort.

What makes barley a healthy choice? Barley has the highest fibre content and lowest glycemic index of the cereal grains. Barley is an excellent source of the cholesterol-lowering soluble fibre beta-glucan. In fact, a 1/2 cup (125 mL) of cooked pearl barley provides an impressive 60 percent of the heart-healthy fibre shown to help lower

cholesterol. It's also a great grain for batch cooking and freezing—making it a helpful time-saver.

Here's how to add barley to your weekly meal plan.

1. Cook barley like brown rice.

If you've tried to cook barley before and it turned out tough or mushy, give it another go. Here's an easy method I often use: make barley in a rice cooker or Instant pot the same way you would make brown rice.

If you cook it on the stove, bring the pot to a boil and then reduce the heat and simmer. Start checking on the barley at the 30-minute mark, and stop cooking when the grains have doubled in size and the texture is to your liking.

For both methods, rinse the barley well with cold water first.

2. Use barley instead of rice.

Barley is more versatile than you might think. If you've bought barley but don't know what to do with it, start with your favourite rice dishes—barley works well in everything from casseroles and pilafs to soups, stews, chili, salads. I often substitute it for rice in stuffed peppers or cook it up in one pot with sliced mushrooms and lentils for a tasty side dish.

3. Try other barley options.

In addition to the pearl and pot barley, you're likely familiar with, you can cook with barley flour, flakes and grits. Barley flour, for example, makes delicious muffins, pancakes, quick breads, cobblers, cookies and other baked goods.

If your grocer doesn't carry different barley products, visit a bulk-food store.

So, what do you say? Find out how easy it is to add barley to everyday dishes at CanadianFoodFocus.org. 🌱

THE ART of CRAFT ALES

Nokomis brewery's commitment to quality, consistency and showcasing what Saskatchewan has to offer

by Liz Allen
Freelance writer

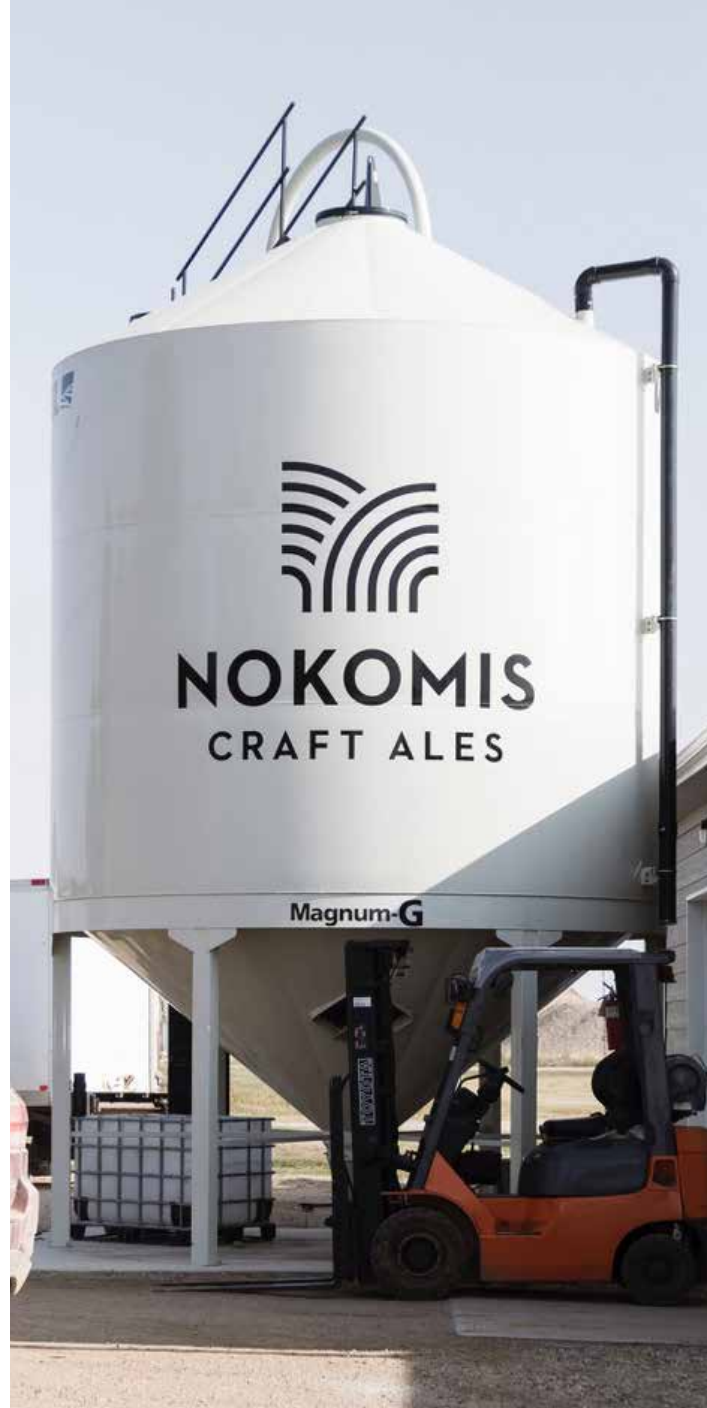
Often, the road less travelled is the one that takes you on a grand adventure. Just ask Jeff Allpot and Kara Uzelman, the founders of Nokomis Craft Ales, who celebrated its tenth anniversary in August.

"Making beer had been a hobby for about a decade," explains Jeff. "We were living in British Columbia and witnessed the craft beer boom. There weren't many craft breweries in Saskatchewan ten years ago and we saw an opportunity. We didn't have a lot of capital and thought there would be an advantage to setting up in Nokomis as it is a great spot that is centrally located with affordable housing and commercial real estate."

Without the brewing and

brewery vocational programs available today, Jeff had to educate himself about production and running a business as they were getting Nokomis Craft Ales off the ground. It launched as a one-man operation in a garage-sized facility, selling beer at farmers' markets and establishing a few tap accounts.

During its first year in business, Nokomis Craft Ales produced about 20,000 litres of beer. Within four years, the facility expanded and a canning line was added. A second expansion increased the production capacity and provided much-needed warehousing as well as a grain bin. Current production is now at 250,000 litres and their classic and contemporary beers



Nokomis Craft Ales launched as a one-man operation in a garage-sized facility; it now supplies liquor stores, bars and restaurants in Saskatchewan and beyond. Photo courtesy Nokomis Craft Ales.

are available in bars, restaurants and liquor stores throughout Saskatchewan and beyond.

"We are always trying to brew the best beer we can," states Jeff. "My focus has always been on all the details that make one beer stand out from the rest, rather than always trying to give the consumer something new and exciting. We brew a lot of seasonal beers, but we have a core lineup that we're

always trying to improve on. I think that's why people have supported us over the years — because when they pick up Nokomis, they know it's a sign of quality and consistency."

"We're traditionalists in a way. You can get a variety of beers from the same basic ingredients, malt, hops, yeast and water, and we use fermentation and conditioning as a driver for the flavours.

We like to showcase what we grow in our province. Our malt comes from Biggar. If we use fruit, we choose Saskatchewan-grown fruit. Our Long Lake Lager showcases 100% Saskatchewan ingredients, with hops from Moosomin.”

Jeff supports the province’s craft brewery industry and collaborates with other local breweries to work with regulators, grow the industry and promote Saskatchewan. Until recently, he held a position on the board of the Saskatchewan Craft Brewers Association (SCBA) and, this year, Nokomis Craft Ales hosted the SCBA “Collaboration Brew” to generate revenue for the grassroots, non-profit organization.

In 2023, Nokomis Craft Ales merged with Pile O’ Bones Brewing of Regina to help them navigate the rising costs of raw materials and find efficiencies on the back end of packaging, sales, marketing and distribution. Collaboration has made both brewers stronger and enables them to maintain



Owners Jeff Allpot and Kara Uzelman enjoy showcasing Sask-grown ingredients in their brews. Photos courtesy Nokomis Craft Ales.

competitive pricing.

While Jeff is kept more than busy as the founder and CEO of Nokomis Craft Ales, Kara is a dedicated artist. A graduate of the Emily Carr University of Art and Design, she has exhibited her sculptures, ceramics and installations at the MacKenzie Art Gallery and the Remai Modern, in addition to other national and international galleries.



Both she and Jeff champion Saskatchewan’s arts and culture scene. In addition to sponsoring The Salt Shaker

Festival in Manitoa each July, Nokomis Craft Ales partners with cultural organizations in Regina and Saskatoon.

Although Nokomis Craft Ales is primarily a production facility that supplies liquor stores, bars and restaurants, it also boasts a taproom and a welcoming outdoor space, open noon until 6:00 pm Thursday through Sunday during the summer, and a small retail store that sells their brews, clothing and branded merchandise. “We are a destination brewery. People visit from across the province and country. They will leave the main highway to visit our town.”

Whether you make it down Highway 20 to Nokomis this fall or enjoy a Nokomis Craft Ale a little closer to home, you may want to mark a reminder in your calendar to buy tickets to their 11th-anniversary soiree next summer. You can look forward to a farm-to-table meal prepared by Hillside Food: Kitchen & Farm of Duval, Saskatchewan and a local musical act. It is, without a doubt, worth the road trip. 🍷

What’s on tap at **Nokomis Craft Ales**



SESSION IPA
4.5% abv

Hazy, hoppy, light and refreshing, with a smooth mouth-feel.



MODERN IPA
6.5% abv

A unique hybrid yeast strain, hop extract, and fruit-forward hop cultivars express the hazy, juicy flavour profile of today’s IPA.



CLASSIC IPA
6.5% abv

A classic IPA, bold flavour and aroma, bursting with citrus and pine.



LONG LAKE LAGER
4.5% abv

Highlighting prairie ingredients, this lager is clean, crisp and crushable.



KETTLE SOUR
4.5% abv

A dry-hopped kettle sour, tart and refreshing with notes of citrus and stone fruit.

**THE SASKATCHEWAN BARLEY
DEVELOPMENT COMMISSION:**

The Saskatchewan Barley Development Commission was established in 2013 under the Agri-Food Act, 2004

**SASKATCHEWAN BARLEY DEVELOPMENT
COMMISSION (SASKBARLEY)**

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