

POGA Represents Oat Producers at the Annual Meeting of Federal, Provincial and Territorial (FPT) Ministers of Agriculture

POGA representatives attended the industry reception for the FPT meeting that was held on July 20, 2022 in Saskatoon. Agriculture issues of concern—including the next five-year agriculture agreement, Business Risk Management programs, fertilizer emissions, trade and market access, and regulatory priorities—were discussed with the Ministers of Agriculture from the three Prairie Provinces.

POGA also spoke with Minister Bibeau regarding concerns over the fertilizer emissions reduction target and the lack of clarity and industry consultation. The plan to link BRM programs to undefined sustainability targets was also discussed.

Ambrely Ralph, POGA/SaskOats director, shares POGA's position: "Programs must not impede production. For these plans to be achievable, producers must be directly engaged in the decision-making process as government moves to integrate environmental practices into programs and we were very glad we were able to voice these concerns directly to Minister Bibeau in Saskatoon. POGA looks forward to a possible meeting with the Minister to further discuss these concerns."



POGA Executive Director Shawna Mathieson; The Honourable Marie-Claude Bibeau, Federal Minister of Agriculture and Agri-Food; POGA/SaskOats board member Jessica Slowski; POGA/SaskOats board member Ambrely Ralph; and POGA Vice-President and SaskOats Chair Chris Rundel — at the FPT Ministers Meeting reception.

Please go to the following links for the Federal news releases for the Sustainable Canadian Agricultural Partnership agreement (effective April 1, 2023):

<https://www.canada.ca/en/agriculture-agri-food/news/2022/07/annual-meeting-of-federal-provincial-and-territorial-ministers-of-agriculture.html>

and

<https://www.canada.ca/en/agriculture-agri-food/news/2022/07/federal-provincial-and-territorial-ministers-of-agriculture-reach-a-new-partnership-agreement-and-inject-new-funds-to-support-the-sector.html>

Dr. Aaron Beattie's Commitment to Oats at the Crop Development Centre (CDC) USASK Celebrates the CDC's 50th Year Working for Saskatchewan, the Prairies and the World

SaskOats Board members Chris Rundel, Jessica Slowski, Ambrely Ralph, and Shawna Mathieson, POGA Executive Director, attended the CDC Kernen Crop Research Farm tour on July 19 and the CDC 50th Anniversary celebration on July 20 in Saskatoon.

The University of Saskatchewan Crop Development Centre's list of achievements over its lifetime is impressive.

More than 500 new crop varieties (across 40 different crop types) have been created, which undoubtedly puts Saskatchewan on the map for excellence in crop development innovation. To read all the details of CDC's five-decade history, visit <https://cdctest.usask.ca/about/our-history.php> and scroll through the page. There, you will find articles by decade, a video, and a pdf booklet outlining milestones and major players involved along the CDC path to success.

CDC's remarkable involvement in oat development and genome sequencing include:

- Developed the first CDC oat variety —Calibre oat—released in 1982; by 1990, Calibre held over 50% of Saskatchewan seeded oat acres.
- The first crown-rust-resistant oat variety (CDC Orrin) registered in 2002.
- Registered the high beta-glucan oat variety, Sol-Fi in 2004.
- Accomplished the first sequencing of the full oat genome for use in open-source applications during the 2010s.
- Developed a fast and accurate method to identify toxins in cereal crops in 2020.

Dr. Aaron Beattie, CDC barley and oat breeder (and University of Saskatchewan (USASK) graduate student), is no stranger to prairie oat producers. He has been the oat breeder at CDC since 2010, replacing Dr. Brian Rosnagel when he retired. Beattie works on developing varieties with improved disease resistance, agronomics and quality, and oat genomics. He spends a good deal of time disseminating information to the industry and the general public, and is definitely one of Western Canada's star advocates for oats. These days, he also increasingly directs attention to oat's protein potential in new food product production.

SaskOats and POGA have supported the CDC and USASK projects for many years, and a lot of these projects are led by Dr. Beattie. Chris Rundel, POGA Vice-President and SaskOats Chair, states, "The value of the work done by Dr. Beattie and the CDC, on behalf of oat (and all grain) producers in Western Canada and beyond, cannot be overstated. Due to their efforts, Saskatchewan is recognized for excellence in oat development, cultivar advancement and information dissemination. We are especially excited about Dr. Beattie's recent crown rust gene mapping and throughput marker project (SaskOats supported), which will lead to potential development of badly needed, rust-resistant varieties, and will also advance gene mapping techniques. The results will be shared with oat breeders around the world."



*Dr. Aaron Beattie, CDC oat breeder, speaking at the CDC 50th Anniversary Field Day, July 20, 2022 (CDC Ruffian oats in background).
Photo credit Chris Hendrickson.*

Gateway Research Organization Oat Trials Provide Growers with Helpful Information

Brad Boettger, AOGC Chair, and Jason Wiese, AOGC Director, attended the August tours of various grain plots and trials being conducted by Gateway Research Organization (GRO) in Alberta. Both directors said the tours provided an excellent comparison of new and current oat varieties available, and that AOGC will continue supporting research to improve oat yields and beta-glucan content to meet producer and oat miller needs.

Oat breeder Jim Dyck, Oat Advantage (OA) from Saskatoon, was invited to speak for the oat section of the Westlock tour. He presented a review of oats in the provincial GRO trial, and spoke on POGA's oat varietal trial at GRO and its support of the OA breeding program. He also highlighted the recent funding OA received from the Results Driven Agriculture Research (RDAR) entity in Alberta and AOGC. Other details included OA's oat breeding work focusing on higher protein, beta-glucan, and the gravity table breeding method (used to select for better and heavier oats).

Dyck has trial plots at Westlock, and states: "I harvest the plots in person, which helps me to see and understand the projects better. The yields on our denser-oat study were very good and the stature of the plants was excellent. I'm also excited to be heading to Australia for the International Oat Conference this fall." During the remainder of this year, Dyck will be conducting 2022 trial processing and then prepare his progress report. POGA will publish an update on OA's trials in the 2023 Spring Oat Scoop.

Dr. Aaron Beattie's Commitment to Oats at the CDC (continued)

USASK CDC: Oat Breeding Program Progress in 2021

After a challenging 2020 due to COVID-19, normal operations for the CDC oat breeding program and its collaborators resumed in 2021. Dr. Aaron Beattie, CDC oat breeder, reports:

The 2021 growing season was defined by very poor soil moisture conditions at seeding, timely rain in early June permitted good early season growth, followed by abnormally hot and dry conditions throughout the remainder of summer.

Overall, plots at Goodale, Preston Seed Farm, Kernen and Codette (all in SK), Lacombe, AB, and Ft. Whyte and Brandon, (both in MB) were drought stressed but uniform, and reasonable data was obtained. Roblin and Portage-la-Prairie, MB sites were extremely poor and thus data from these sites was not used.

During the summer, 6,516 lines were evaluated at disease nurseries coordinated by the University of Saskatchewan for crown rust, stem rust, smut, fusarium head blight (FHB) and barley yellow dwarf virus (BYDV).

Most nurseries operated normally in 2021, however the drought conditions reduced disease development in nurseries operated in Western Canada and Minnesota. In contrast the oat crown rust nursery in Ontario provided good data.

Over the winter a total of 42,595 marker data points were collected on breeding material related to four crown-rust resistance genes and one quality trait, and 20,199 analyses were conducted in the quality lab for beta-glucan, total dietary fiber, protein, oil, and groat percentage. This data was used to assist in decisions regarding lines to advance to 2022 trials.

A total of 308 early generation milling oat populations and 2,894 advanced milling oat lines were grown and evaluated for agronomic performance, reaction to various diseases, and physical grain quality traits.

Fifty new crosses were made in 2021, including one cross to incorporate the hairless groat characteristic. OT3112, which was supported for registration in February 2021, was officially registered with CFIA in 2022 as CDC Anson. It is being marketed by FP Genetics.

The following lists CDC's oat program 'breeding objectives and targets':

1. Agronomics

- Grain Yield: better than CDC Arborg
- Lodging Resistance and Maturity: equal to or better than CDC Arborg
- Plant Height: equal to or shorter than CDC Endure

2. Physical Grain Quality

- Groat Percentage and Test Weight: equal to or better than CDC Arborg
- Plumpness/Thins and Thousand Kernel Weight: equal to or better than CDC Endure
- White Hull: equal to CDC Arborg or CDC Endure
- Uniformity (fewer tertiary kernels): equal to CDC Dancer
- Hairless: no comparator, using VAO-51

3. Nutritional Grain Quality

- Beta-glucan and Fat: equal to or better than CDC Endure
- Protein and Total Dietary Fibre: equal to or higher than Leggett

4. Disease Resistance

- Crown rust and FHB: MR (moderately resistant) or better
- Stem rust and BYDV: Intermediate reaction or better
- Smut: equal to CDC Endure (resistant)

SaskOats board member Jessica Slowski attended both the CDC oat plot tour and the CDC 50th Anniversary tour in July. She shares some thoughts on the CDC breeding program: "The relationship between CDC, SaskOats, and all oat producers is one we can be proud of. We have supported this research for many years, and the oat-related highlights from CDC's anniversary achievements are only a short list of examples that demonstrate why we support this program. Prairie producers directly benefit from CDC's globally recognized commitment to oat cultivar development."

Dr. Beattie states, "Producer uptake and experience with some of our recent varieties, CDC Arborg and CDC Endure, have for the most part been very positive. Producers appear to be seeing good yields and lodging resistance in these varieties. We saw a big uptick in acres of CDC Arborg in 2021 and expect to see similar increases for both varieties in 2022."

Shawna Mathiesson, POGA Executive Director, at Work

Shawna Mathieson met with senior AAFC officials in both June and September to advocate for continued funding for oat breeding programs. POGA continues to stress that smaller crops are critical for sustainability and crop diversity in the agriculture sector, and the federal government's plan to decrease breeding program funding will work in opposition to sustainability goals.



REGISTER TODAY!

 CropConnect Conference 2023

February 15 & 16

Victoria Inn Hotel and Convention Centre in Winnipeg, MB.

www.cropconnectconference.ca

Dr. Aaron Beattie's Commitment to Oats at the CDC (continued)

On-going Crown Rust Resistance Project

The Oat Scoop introduced Dr. Aaron Beattie's project, *Development of markers linked to oat crown rust resistance to help breed improved oat varieties for Saskatchewan producers*, in the November 2019 Oat Scoop. We also published articles on his reports for Year One in the November 2020 issue and Year Two in the November 2021 issue. Readers can also obtain all detailed reports on POGA's *Research in Progress* page:

<https://poga.ca/research/research-in-progress/>.

Crown rust is the largest on-going threat to oat production worldwide. *Puccinia coronata* Corda f. sp. *avenae* Eriks is the fungal pathogen which causes oat crown rust. It results in yield losses of current crops by severely weakening oat straw, which causes the plants to lodge. If left unchecked, myriad spores are released, spreading the damage further afield and causing more problems in the future.

Producers' best defense against the pathogen is to plant disease resistant varieties and, if that fails, to apply fungicide (which, obviously, increases input and labour expenses). Unfortunately, crown rust is a wily adversary and can quickly mutate/evolve to overcome resistance in plants.

Beattie's project aims to keep ahead of the disease and continually develop new oat cultivars by incorporating new resistance genes with currently used seedling and adult plant resistance genes (using gene pyramiding, which combines multiple genes within the same variety) to hopefully create more durable resistance.

The research team has completed Year Three and report good progress made to date.

Here is a list of terminology and definitions that you will encounter throughout the remainder of this article:

- Gene mapping locates the position of a gene on a chromosome.
- Quantitative Trait Loci (QTL) mapping is a method used to identify regions of the oat genome (genes) that control, in this case, resistance to crown rust.
- *Pc##s* are specific crown-rust-resistance genes being studied in the project for the purposes of oat varietal development.

Project objectives (*and progress to date in italics*):

1. Evaluate crown rust reaction in oat populations (in growth chambers and field nurseries) created from two parents, one parent carrying a specific resistance gene and the other not (in such populations, some of the lines will inherit the resistance gene and other lines will not). *Crown rust reaction was evaluated in seven populations segregating for five different resistances including Pc46, Pc48, Pc63, Pc67, and adult plant resistance.*
2. Perform QTL mapping of crown rust resistance.
 - *A marker was linked to Pc48.*
 - *High throughput markers associated with Pc40 were confirmed in two additional populations and can now be used by breeders and researchers.*
 - *Markers associated with Pc46 and Pc62 are currently being screened on confirmation populations.*

Dr. Beattie shares, "The information collected to date over the course of this project has allowed us to understand

that the *Pc40*, *Pc46*, *Pc62* and *Pc98* genes are located in different regions of the oat genome. This means that oat breeders could pyramid different combinations of these genes to potentially provide more effective crown rust resistance in future varieties."

Due to delays caused by COVID, the project has been extended by one year to complete the proposed work (and now ends in 2024).

Results from this project have the potential to positively affect growers due to greater yield per acre and lower cost of production (reduce/eliminate fungicide use). This also could be good for oat millers due to increased gains by maintaining grain plumpness and test weight. Marker results are also being made available to all oat breeders and researchers, which benefits current and future breeding efforts.

This project is funded by the Agriculture Development Fund (ADF) of Saskatchewan under the Canadian Agricultural Partnership, a federal, provincial, territorial initiative, and co-funded by the Prairie Oat Growers Association (POGA) and Western Grains Research Foundation (WGRF).

Your POGA Board at Work

Jenneth Johanson, POGA President, attended the June 29 industry engagement session in Winnipeg hosted by The Honourable Derek Johnson, Manitoba Minister of Agriculture.

The meeting was held in advance of the Federal Provincial Territorial Ministers of Agriculture July meeting, and Business Risk Management was a key topic of discussion. Johanson states, "Sustainability metrics must not be tied to crop insurance. While this is not currently being proposed by the government, POGA believes it is important to mitigate the possibility of heading down this path. If crop insurance or risk management programs are not available to all producers in the future, it would devastate the industry, and have an extremely negative effect on the country and the world."

Jenneth Johanson also attended a virtual meeting with the Government of Manitoba on July 6 to provide industry input for the next National Policy Framework (the program for research and marketing funding programs available through the Province of Manitoba and through the Government of Canada).

Johanson stressed the need for timely funding reviews, increased cost sharing for small crop breeding programs in Western Canada, and support for international trade missions to expand markets.

Dr. Aaron Beattie's Commitment to Oats at the CDC (continued)

Oats: Stand at Attention!

A Project to Address Oat Lodging

Oat producers know all about the losses caused by oat lodging when stems buckle or root anchorage systems fail. That is why oat lodging resistance is one of the priorities for new varietal development. However, more information regarding the traits important for lodging resistance needs to be gathered to arm oat breeders with the tools to efficiently create new lodging-resistant germplasm.

To support this research, POGA has entered into an agreement to fund a new project: *Oat Lodging: Identifying key root and shoot traits for improved standability*. This is a joint collaborative effort between Dr. Allan Feurtado, team lead of Integrated Omics and Climate Resilience at the National Research Council of Canada's (NRC) Aquatic and Crop Resource Development Research Centre -and- Dr. Aaron Beattie, oat breeder at the University of Saskatchewan Crop Development Centre.

The project summary states: *The project will utilize a suite of innovative root imaging systems to characterize root system architecture in relevant Canadian oat germplasm and, furthermore, incorporate analyses of stem strength and root anchorage from prairie field environments. Plant growth habit (shoot architecture) will also be analyzed as this has been associated with lodging in oat. The combined assessments using high-throughput imaging and biomechanical strength testing will define root and stem traits that are critical for lodging resistance—thus, laying the groundwork for incorporating robust standability traits into future western Canadian varieties.*

Feurtado comments, “At the NRC, we have developed a suite of tools and methods to characterize crop root systems including 2- and 3-dimensional imaging approaches with nutrient solutions, to visualize root systems in an easy, high-throughput manner, but also through soil imaging which better reflects our field environments. The intent is to robustly characterize oat root system architecture, which defines the shape and spatial arrangement of the root system, and to develop complimentary methods that connect with the project’s field trials.”

Collaboration being key to the success of the project, Feurtado and Beattie have partnered with Leon Kochian at the University of Saskatchewan Global Institute for Food Security, noted for his expertise and novel approach to assess root system architecture in 3-D.

Project objectives are as follows:

- Evaluate root system architecture in oat cultivars which vary in lodging resistance.
- Evaluate stem and root lodging in field trials.
- Assess the impact of seeding rate on key stem and root-lodging-related traits in field trials.
- Assess the correlation between various root phenotyping¹ methods to develop a robust trait selection pipeline for breeding application. ¹*Process by which observable traits (of a plant) are measured or characterized.* Here, the ultimate goal is to identify a high-throughput system which captures field-relevant, root-trait data that can be used by breeders for selections and ultimately genetic mapping of important

root traits to facilitate future molecular marker development.

- Compare root system architecture between Canadian oat germplasm and a diverse set of oat germplasm. The ideal root system will display plasticity through environmental stresses, optimizing nutrient and water uptake with robust plant anchorage (and lodging resistance).

Beattie summarizes, “During the project we will attempt to get a comprehensive understanding of the different oat traits (both stem and root-related) that are key drivers of good lodging resistance. These traits will inform breeding decisions and ideally be selectable even in the absence of observable field lodging.”

Test sites will represent modest and high fertility situations: Saskatoon (irrigated and dryland) and Codette, SK; and, Waldheim and Brandon, MB.

By all accounts, oats are a significant domestic and export crop. Demand from consumers, millers and the international market continues to increase. More lodging-resistant oat varieties will help producers meet this demand and continue to grow Canada’s trending, competitive advantage. In addition, other problems that occur as a result of lodging will be reduced or eliminated (e.g., mycotoxin contamination, increased producer time and costs when harvesting lodged crops, and poor physical and nutritional quality of lodged oats).

This three-year project ends in 2025. POGA will publish articles to keep producers informed on the progress as annual performance reports are received, and will provide more methodology detail in those future updates.

This project is funded by the Agriculture Development Fund (ADF) of Saskatchewan under the Canadian Agricultural Partnership, a federal, provincial, territorial initiative, and co-funded by the Prairie Oat Growers Association (POGA) and Western Grains Research Foundation (WGRF).

Your SaskOats Board at Work

- Garry Johnson, former SaskOats/POGA Director, attended the July 12 Swift Current Research and Development Centre field tour and viewed oat/pea intercropping trials funded by SaskOats and the Agriculture Development Fund (ADF). Project results for 2021 can be found at <https://poga.ca/research-projects/intercropping-pea-with-canola-or-oat-impact-on-nitrogen-disease-and-economics/>
- SaskOats reviewed the Saskatchewan Pest Control Act and provided feedback to the Government of Saskatchewan before drafting of the new Act began.

Brandon Oat Breeding Program Current Achievements at the POBC

Dr. Kirby Nilsen is the Prairie Oat Breeding Consortium (POBC) Program Lead and Research Scientist at the Agriculture and Agri-Food Canada (AAFC) Brandon Research and Development Centre (BRDC).

The BRDC Oat Breeding Program develops milling oat cultivars, both for conventional and organic production (including the rust-prone and rust-free regions of western Canada).

The POBC is involved in the development of new oat cultivars which are suited to production in western Canada and that meet the requirements of end-use markets identified by POGA and the milling industry. It also plays a role in the varietal registration process.

Oat breeding at BRDC starts by selecting and crossing parent varieties that are known to perform well in the region. The early generations of these crosses are selected for qualitative traits, such as disease resistance and good agronomics. Advanced generations are then selected for quantitative traits such as grain quality and yield.

Nilsen explains, “Crossing oat is extremely challenging with a low success rate relative to other crops like wheat. We select the best parental varieties in terms of their yield, quality and disease. From just a few first generation (F1) seeds we are able to generate large segregating populations for each parental combination. Selection is applied throughout the process to identify breeding lines which show improved performance by the end of the breeding cycle (F8-F11).”

The breeding cycle is accelerated at the early generation stages by utilizing alternating-season nurseries, which allows the creation of two generations per year. New Zealand locations are used to select for several diseases (rust and barley yellow dwarf virus [BYDV—which is becoming another disease of concern in oats]), height and lodging.

Successful varieties that pass to the advanced generation stage are tested at several trial locations across western Canada, subjected to four+ years of yield testing, and evaluated for agronomics, disease and quality.

AAC Douglas (OT2122) is a new BRDC variety which recently received registration. This variety boasts good yield; early heading and maturity; high test weight (TWT) and thousand kernel weight (TKW); groat percentage that is better than the test average and AC Morgan; excellent protein and beta-glucan content, and acceptable dietary fiber with average oil content; and, disease resistance (average for smut, moderate for oat crown rust and fusarium head blight). AAC Douglas is licensed to SeCan.

AAC Wesley (OT2129) has recently been licensed to FP Genetics. Yield is 103% of Summit’s yield; plant height is about the same as Summit but it matures four days earlier. It has good lodging resistance with similar groat percentage and beta-glucan and TWT and TKW are equivalent to Camden. This variety’s stand-out traits include early maturity, short plant height and high groat percentage. It also consistently scores low for oat crown rust, stem rust, BYDV and has low deoxynivalenol toxin (a mycotoxin sometimes found in oats).

The organic breeding line OT8011 is currently undergoing registration trial testing. It was selected on-farm via the Participatory Plant Breeding program. In 2021, it yielded 107% of Summit; plant height, lodging, TWT and TKW are similar to Morgan with two days earlier maturity. It has a good groat percentage; is resistant to smut and moderately resistant to BYDV; and is moderately susceptible/susceptible to crown and stem rust.

Researchers continue to expand the knowledge base of the huge and complex oat genome. The first oat genome has been made available, and marker-assisted breeding is employed at BRDC. This technology allows researchers to zero in on the genes in a given variety which have a large effect on plant traits. It enables parental screening and selection in early generation breeding material, and it is cost efficient (<20% of field screening costs).

BRDC is actively pursuing a Genomic Selection (GS) strategy to complement existing breeding work. In 2021, leaf tissue samples were taken, and DNA extracted and genotyped. GS models were applied to generate predictions, then lines were selected by the model and grown in yield plots to validate the predictions.

Results from the pilot study indicate that GS can predict the yield performance of test lines, but is often deficient in its ability to predict certain traits needed for new varieties (e.g., height, maturity date, and groat and plumps percentage). This study could lead to future projects to optimize multi-trait selection models (i.e., increase the number of traits screened at the GS level prior to large-scale physical trials, making breeding faster with, hopefully, better varieties as the end result).

Yves LaPointe, POGA Vice-President and MOGA Chair, states, “The BRDC and POBC programs are vital to the development of new oat lines that meet the requirements of producers, millers and consumers. POGA supports furthering the GS model, as increased screening criteria has the potential to bring new and improved lines to the market sooner, benefiting the whole value chain from producers to consumers.”

The first tour since 2019—the 2022 Oat and Wheat Tour—was a real highlight for the BRDC. The tour was a great opportunity for industry and funding partners, AAFC researchers and staff, and producers to come together again and learn about the interesting breeding work being conducted by Drs. Nilsen and Santosh Kumar (BRDC Research Scientist and wheat breeder).



Tour participants inspecting the BRDC oat nursery for leaf and stem rust.

The tour showcased the work being done to develop varieties that enhance profitability and contribute to sustainable agriculture. Nilsen spoke about the oat disease nurseries and Kumar gave an overview of the breeding process. Both then gathered their team to take participants around the site and discuss their work at the Centre (e.g., equipment used, molecular markers for breeding, etc.)

Nilsen shares, “There were ~80 participants for the event and they had lots of questions and comments for the whole team. Overall, based on the knowledge the Oat and Wheat Breeding Group shared and the attention we received from participants, the day was a great success!”

The POBC is funded by Austgrains, Emerson Milling Inc., FP Genetics, General Mills, Grain Millers Canada, Prairie Oat Growers Association (POGA), Richardson Pioneer, SeCan, and the Government of Canada under the Canadian Agricultural Marketing Partnership’s AgriScience Program, a federal, provincial, territorial initiative.

To continue this vital breeding program, POGA is currently working with industry partners to apply for further federal funding.

Wild Oat Stimulation: Final Report Researchers Look for Ways to Take Out Wild Oats Before They Take Over Your Crops

In the 2021 March issue, the Oat Scoop introduced Dr. Shaun Sharpe’s one-year project in the article: *Stimulating Wild Oat Germination*. The following final performance summary report was provided by the research team. Please go to <https://poga.ca/research-results> to read the full report.

Stimulating Germination and Emergence of Wild Oat (*Avena fatua*), Volunteer Oat (*Avena sativa*), Barley (*Hordeum vulgare*), and Wheat (*Triticum aestivum*) with Pyroligneous Acid and Potassium Nitrate

Shaun M. Sharpe¹, Taylor Kaye¹, and Breanne D. Tidemann²
(¹Saskatoon Research and Development Centre, Agriculture and Agri-Food Canada; ²Lacombe Research and Development Centre, Agriculture and Agri-Food Canada)

Wild oat is a troublesome weed on the Canadian Prairies. It occurs across a wide area and seeds accumulate in the soil over time. These seeds do not all emerge at once or even in one season. This results in flushes of wild oat emerging through the growing season instead of consistently at the start of the season once winter is over. Herbicide resistance in wild oat is present to Groups 1, 2, and 15 (formerly 8) and metabolic resistance has been noted, which may compromise additional herbicides. This complicates control strategies leaving farmers with fewer options to control wild oat. The objectives of this research were to evaluate the potential of applying products to the seeds and soil to encourage wild oat and volunteer cereals to germinate and emerge from the ground. Essentially, the idea is that if farmers could get wild oats to emerge faster and all at once, the wild oats could be eliminated before their crops emerge from the soil.

This research was conducted in an incubator in Saskatoon, SK, in 2021. The stimulants of interest were pyroligneous acid, also known as wood vinegar or smoke water, as well as potassium nitrate, a form of nitrogen fertilizer. Potassium nitrate was chosen due to widespread use of nitrogen fertilizers and familiarity for farmers since

equipment and knowledge is already present. Smoke water was chosen due to previous research and that wild oat may be sensitive to smoke due to fires frequenting the prairie and forest before widespread agricultural adoption. When working in petri dishes with just the stimulants, the smoke water induced dormancy in all the species using 5 to 100% solutions. Smoke water did increase the speed of emergence for wild oat by spraying 50 to 100% solutions at 200 L ha⁻¹ (21 GPA) on freshly produced seed deposited either on top or in 1 cm of field soil. Burial of seed in the soil did not impact smoke water’s influence on wild oat emergence, indicating a spray will get shallow buried seed. Barley was also sensitive to smoke water, but this was with a 1% solution.

The wild oat used in this study was insensitive to nitrogen, limiting how effective using nitrogen as a stimulant could be on a broad scale. While these findings are experimental, the identified spray pattern (50 to 100% solutions of smoke water at 200 L ha⁻¹) gives a good starting point for additional research in the field which could be adopted by farmers with conventional spray equipment in the future. Additional research would be required to determine if applying a stronger solution of smoke water would have an herbicidal-activity effect on emerged vegetation.

To hear Dr. Sharpe talk about this project, plan to attend the POGA AGM on December 1 (see the back page of this issue for the full agenda).

This project was funded by Saskatchewan Oat Development Commission (SaskOats), Saskatchewan Wheat Development Commission (Sask Wheat), and Manitoba Crop Alliance.

POGA Raises Producer Concerns on Federal Fertilizer Emission Targets

During the month of September, POGA worked to ensure producers’ concerns were represented regarding the federal government’s fertilizer emissions/reduction strategy. Shawna Mathieson, Executive Director was involved in the activities listed below:

- In association with SaskCrops, met with Environment and Climate Change Canada (ECCC) to discuss SaskCrops submission to the federal government on the Fertilizer Reduction Strategy.
- Participated in a Fertilizer Emissions Workshop held by the federal government.
- In association with SaskCrops, met with experts from the University of Saskatchewan and the Global Institute for Food Security to discuss the Fertilizer Reduction Strategy and challenges producers face with the proposed targets.

This was also a key topic discussed with Honourable Marie-Claude Bibeau, Minister of Agriculture and Agri-Food Canada in July 2022 and the Honourable Senator Robert Black in August 2022.

AAFC Fertilizer Emissions Reduction Target Strategy – POGA provided input independently and collaboratively via partner submissions. Readers can view the contribution from POGA and others at <https://poga.ca/> under Latest News.

Producer Consent Form

POGA has received requests from international oat buyers to source oats directly from producers. If you are an oat producer in Alberta, Manitoba or Saskatchewan and are interested in being contacted by these companies for potential direct oat sales, head over to the main page at <https://poga.ca/>, click on and fill out the Producer Consent Form. Your contact info will be included in a list provided to companies inquiring about direct-from-producer sales.

Results of 2021 Seed-Borne Fusarium on Cereal Crops Survey Available

This survey provides a record of seed-borne pathogen trends in pulse and cereal crops and allows for continued tracking of diseases over time. It is intended to provide a benchmark for annual seed-borne pathogen levels across Saskatchewan. For 2021 results go to:

<https://poga.ca/research-projects/selecting-crop-sequences-and-developing-a-risk-model-to-mitigate-fhb-in-western-canadian-cereal-production/>

Funding was provided by: SaskOats, Saskatchewan Pulse Growers, Sask Wheat, and SaskBarley.

Your POGA Board at Work

Jenneth Johanson, POGA President, and Shawna Mathieson, POGA Executive Director, met with Senator Robert Black on August 23 in Regina and toured Avena Foods. POGA discussed the challenges around the fertilizer emission reduction goals proposed by the federal government. They also stressed that the federal government's sustainability goals would be negatively impacted should their plans to reduce funding for oat breeding transpire, explaining that research and variety development are essential to increase agricultural sustainability and resiliency.



POGA Executive Director Shawna Mathieson; POGA President Jenneth Johanson; Honourable Senator Robert Black; Avena Foods Vice President of Operations James Del Frari; Avena Foods Director of Procurement Mike Gallais

MOGA sponsored Great Tastes of Manitoba (GTOM) and the recipe Three Seed Granola, featuring oats, was released in a recent episode. Two more oat recipes will be featured this fall.

Check out the oat recipes featured by Great Tastes of Manitoba at greattastesmb.ca.

https://twitter.com/OatGrowers/status/1575222317277380614?ref_src=twsrc%5Etfw%7Ctwcamp%5Eembeddedtimeline%7Ctwtterm%5Escreename%3AOatGrowers%7Ctwcon%5Es1



Organic and Low-Input Field Day at the Swift Current Research and Development Centre

After a two-year delay due to COVID, a very successful Organic and Low-Input Field Day was held at the Agriculture and Agri-Food Canada Swift Current Research and Development Centre (SCRDC) in July. The event was organized by the Organic Research Program at SCRDC, SaskOrganics, and the Advisory Committee on Organic Research for SCRDC. Field tours included six organic field trials including oats and other crops. The trials ranged from intercropping to cover cropping and the subsequently-grown cash crops; a new project on the contribution of oat to soil fertility; and other trials of interest. In addition, speakers provided indoor presentations related to climate change, cover cropping in SK, and organic practices at Vilicus Farms in Havre, Montana. Researchers also provided an update on activities by SaskOrganics, and other topics of interest to organic and low-input producers in the Prairies.

The 2022 Field Day handout distributed to participants is available at <https://saskorganics.org/production-resources/>.

Note pages 9-11 for trials as part of a project on Intercropping and Living Mulch, partly funded by POGA. For more information on any aspect of the research projects, please contact: myriam.fernandez@agr.gc.ca.

Receive
Oat Scoop
electronically!

Simply go to www.poga.ca and click on Sign up to receive the Oat Scoop by e-mail.

We will then remove your name from the print mail-out list.

Beyond Beta Glucan

A First-of-its-Kind, Diet-Based Research Project

Dr. Sijo Joseph (Thandapilly) is a Research Scientist, Morden Research and Development Centre, Agriculture and Agri-Food Canada, Winnipeg, and an Adjunct Professor in the Department of Food and Human Nutritional Sciences at the University of Manitoba. He is also the project lead for the POGA-supported project: *Beyond β-glucan: Demonstrating health benefits of oat protein*. The Oat Scoop introduced this project in the Spring 2021 issue.

This project is being carried out in collaboration with Dr. Thomas Netticadan, a Research Scientist and Science Team Lead in the Agri-Food and Food Security Group at the Morden Research and Development Centre and Dr. Lovmore Malunga, a Research Scientist with Agriculture and Agri-Food Canada.

Dr. Joseph explains the main thrust of the project: “The primary objective of this study is to establish the health benefits of oat protein in terms of reducing abnormal levels of circulating cholesterol and glucose. For the first time, this study will establish the specific effects of oat protein on the cholesterol and glucose metabolism.”

Experimental rats are being used in the study. The project is in Year Two, and the following lists objectives and results achieved to date (in italics).

Objective—Extract protein from Canadian-grown oats. *A newly developed wet-extraction method was used to extract the protein, which then replaced casein (a protein) in the experimental animal diet. Chemical analysis determined the purity of the protein to be nearly 90 percent. It can be used as a food ingredient or as a protein supplement.*

Objective—Determine the hypocholesterolemic¹ activities of oat protein. Dr. Joseph states, “Oat protein appears to affect cholesterol levels differently than other oat bioactive compounds (including beta-glucan on its own). Therefore, oats have a unique position in dietary cholesterol management, as its components (such as beta-glucan and oat protein) can act synergistically (i.e., *create affects greater than the combined effects produced by each component separately*) to provide hypocholesterolemic effects.” ¹*According to the National Library of Medicine, hypocholesterolemic is the total cholesterol (TC) and low density cholesterol (LDL-C) levels below the 5(th) percentile of the general population adjusted for age, gender and race.*

Three different diet formulations were used to compare results:

- A control diet (casein as protein).
- A high-fat, high-sucrose diet (casein as protein) (HF-casein).
- A high-fat, high-sucrose diet (oat protein replacing casein) (OP+HF).

Dr. Joseph summarizes, “Our results demonstrate that the OP+HF group had significantly lower serum LDL-Cholesterol, HDL-Cholesterol and total cholesterol levels compared to the HF-casein group. Additionally, serum triglyceride levels are significantly elevated in the OP+HF group compared to the control group. However, the triglyceride levels of the OP+HP group were determined

to be not significantly different from the HF-casein group.” (Note: triglycerides are a type of fat stored in the blood when caloric intake exceeds immediate energy needs, and is released when needed between meals. When consumption consistently exceeds energy requirements, high triglyceride counts, determined by a lipid profile, may lead to risks such as stroke or heart disease.)

Dr. Joseph wraps up the key achievements of this objective to date: *“This animal study shows that oat protein supplementation can improve the blood lipid profile in high-fat-fed rats, suggesting the cholesterol lowering potential of oat-derived proteins. This is the first study to demonstrate the metabolic benefits of oat-derived proteins in rats.”*

Objective: Explain the mechanisms in which oat protein can lower cholesterol and markers of metabolic syndrome (i.e., *a host of conditions that can increase risk of heart disease, stroke and diabetes*). Study rats were tested to determine fasting blood-sugar levels; heart structure and function was also assessed. Blood pressure measurements were taken at regular intervals throughout the study. Cholesterol metabolism was measured and analysis was completed for short-chain fatty acid, intestinal inflammation and microbial activity.

Dr. Joseph explains, “Our results show that oat protein is able to effectively improve cardiac parameters in a high-fat, high-sucrose diet model. The OP+HF group had significantly improved ejection fraction, a parameter assessing heart function compared to the HF (casein) group. There was no significant variation in systolic and diastolic blood pressure among all groups. In addition, the HF-casein and OP+HF groups had a significantly higher body weight compared to the control group, which is to be expected in this model.”

In closing, Dr. Joseph states, “The results from this study will enable us to conduct future human studies to evaluate the healthfulness of oat protein and potentially lead to additional health claims for oat and oat-derived components.”

A review article has been published, and at project end, the results from the study will be written and submitted to a peer-reviewed journal. Upon project completion, AAFC Fact Sheets, which summarize oat protein research and concepts, will also be produced and made available to the industry and public.

Please go to <https://poga.ca/communication-advocacy/poga-latest-news/> to read the news release on federal funding. The three-year project ends in 2023. This project is funded by POGA; PepsiCo, USA; and the Government of Canada under the Canadian Agricultural Partnership’s AgriScience Program, a federal, provincial, territorial initiative.

Your MOGA Board at Work

Edgar Scheurer, MOGA Director, attended the SeCan Manitoba Plot tour on August 11 in Warren, MB and said it was an excellent opportunity to see trials of new and current oat varieties. Scheurer states, “SeCan provided a tour of three new oat breeding plots being grown by Riddell Seeds and it was interesting to learn about the future possibilities for oats.”

POGA's Online Marketing Campaigns Set to Surpass Targets Again

All three projects, including marketing efforts in Mexico, Japan and Canada, have funding committed from April 1, 2021 to March 31, 2023, and targets have already been exceeded or are on track to do so by the end of the period. The indicators below are as at August 31, 2022.

Mexico - Avena Canadiense

This project has already reached the total target for Facebook followers (>375k).

The recipes posted to the page may have something to do with this success. Delicious dishes such as *Ensalada de Manzana con Avena* (Apple Salad with Oatmeal), for instance, reached >56k people. All four new recipes posted in the period reached a total of 255k people. Activity on the social media platforms (Twitter, Facebook YouTube and Instagram) significantly increased during the month of August. The YouTube channel continues to grow, with just under 2k followers at the end of this reporting period.

The eighth annual Avena Canadiense recipe contest took place in May, 2022. Contestants were invited to submit recipes for four categories: *Inspired by Mexican cuisine, Vegetarian, Gluten Free, and Creative*. There was also a special category for contestants under 25 years of age. Following the contest, a virtual ceremony (<https://www.facebook.com/Avena.Canadiense/videos/494267219140242>)

was held through the Avena Canadiense Facebook account to honour the 13 winning chefs and showcase their recipes. The ceremony garnered >197k views and reached >230k people on Facebook alone.

The annual contest event provides an opportunity for people to share recipes that incorporate oats. This promotes the consumption of oats and highlights its many health benefits. The recipes are available on the Avena Canadiense website (<https://avenacanada.com/>) and are regularly shared on the social media channels. POGA encourages readers to follow the accounts on Facebook and YouTube for inspiration to create easy and delicious recipes for breakfast, lunch, dinner, and snacking!



Jenneth JOHANSON

Presidenta de la Asociación de Productores de Avena de Canadá (POGA)

Seleccione el canal en español para escuchar la traducción.



POGA President Jenneth Johanson speaking at the Avena Canadiense recipe contest virtual ceremony.

Japan - Kanadanootsumugi

As of August, the target for Facebook followers was reached (3k) and the target for the number of views was exceeded by more than double (22k). The favourite recipe, by far, was one for *Chicken Katsu* (Japanese-style fried chicken with oatmeal breading).

The Mexico and Japan projects are supported by the Prairie Oat Growers Association (POGA) and funded through the AgriMarketing Program under the Canadian Agricultural Partnership, a federal, provincial, territorial initiative.

Canada - Oats Everyday

The Facebook follower target (50k) has already been surpassed by ~8k. The *Carrot Cake with Oatmeal* video recipe (<https://fb.watch/geHqmzarxe/>) was by far the most popular, reaching >75k people. The website engagements are also doing well, with 38k (2k over target).

This project is supported by the Prairie Oat Growers Association (POGA) and funded by 1) the AgriMarketing Program under the Canadian Agricultural Partnership, a federal, provincial, territorial initiative, and 2) the Canadian Agricultural Partnership, Ag Action Manitoba—Industry Development Program.

POGA will provide detailed updates for these projects in the next Oat Scoop.



Shawna Mathieson, POGA Executive Director, met with Murat Camkoru, a representative from ETi—a Turkish company that produces snack food. ETi currently contracts about 20,000 hectares of oats in Turkey but is looking to increase oat sources in other regions. The meeting was coordinated by Global Affairs Canada.

The Value of Oats for Dairy Feed Phases Two and Three - Research Report

The March 2019 Oat Scoop article, *Oats and Dairy Research Project*, introduced Dr. Peiqiang Yu's research trial, *Develop New Strategies to Efficiently Utilize Oat Grains in High Production Dairy Cows to Maximum Economic Return and Benefit to Prairie Oat Growers*. In the June 2020 issue, we updated you on Phase One of the project.

Dr. Yu has completed Phase Three and submitted a report to POGA; readers can visit the research page at <https://poga.ca/research-projects/develop-new-strategies-to-efficiently-utilize-oat-grains-in-high-production-dairy-cows-to-maximize-economic-return-and-benefit-to-prairie-oat-growers/> to read the whole report.

Phase One objective: To systematically compare the feed milk value (FMV) of different prairie oat grain varieties/types to common barley for dairy cattle in western Canada in order to determine the oat variety or type with the highest FMV for dairy cows.

As a reminder, several summary statements Dr. Yu made when concluding the first phase:

- In general, the higher Metabolizable protein (MP) and FMV, the better the feed. Oat grain is lower in MP and FMV compared with barley grain, and needs to be improved.
- All oat had lower degraded protein balance. It reduces potential nutrient loss in dairy cows.

Phase Two objective: To improve/increase FMV and MP of the feed and/or milling type of oat grain through feed processing applications (e.g., steam-flaking vs. rolling vs. pelleting) in comparison with barley for lactating dairy cows. The processing conditions will be determined for prairie oat grain grown in western Canada's cool climate conditions. Different feed processing methods/ technologies will be tested and applied at the Canadian Feed Research Centre (CFRC). The same varieties of feed and milling oats used in Phase One were used in Phase Two.

Dr. Yu's summary conclusion from this phase: "The present study showed that grain processing methods did not significantly alter the protein molecular structure, but it was effective in increasing the intestinal digestibility of starch and crude protein. This increase in nutrient availability in the small intestine, coupled with a closer to optimum degraded protein balance (OEB) can potentially increase the production performance of dairy cows."

Phase Three (this portion of the project will be divided into two sub-projects); Sub-project One: To determine the effect of heat processing in protein molecular structure of newly developed oat varieties/types (feed and milling types) and the protein nutritive value in dairy cows. *Note: Sub-project Two is on-going and results will be shared in the next report.*

Dr. Yu's summary conclusion from the sub-project of this phase: "It can be concluded that heat processing can change the chemical profile, the protein subfractions proportions, as well as rumen degradable protein and rumen undegradable protein, without negatively affecting the intestinal digestibility, which is very good news. A special spectroscopy test revealed that heat processing

changes the molecular protein structures in oat varieties tested which means it may make sense to feed heat-processed oats to dairy cattle to increase the FMV and MP but further testing is still needed."

"These interesting findings of prairie oat research are being presented at industry and scientific meetings and two, full manuscripts will be written," shares Dr. Yu.

For detailed project information, please contact Dr. Peiqiang Yu, Professor and Ministry of Agriculture Strategic Research Chair in Feed R&D, Department of Animal and Poultry Science, College of Agriculture and Bioresource, University of Saskatchewan: 306-966-4132; peiqiang.yu@usask.ca.

This project is co-funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) for Collaborative Research and Development Funding (CRD), Prairie Oat Growers Association (POGA), SaskMilk, and Saskatchewan Ministry of Agriculture Strategic Research Chair Program in Feed R&D.

POGA at Work

Wade Hainstock, former SaskOats/POGA director, and Shawna Mathieson participated in the Canadian Field Crop Research Alliance (CFCRA) on June 28 to discuss funding for the Brandon oat breeding program given the reduction in funding from Agriculture and Agri-Food Canada (AAFC).

In August, Hainstock and Mathieson also participated in the CFCRA AGM where Hainstock was elected Chair of the Board for the upcoming year. At this meeting, matching funds were secured through POGA and numerous industry partners to utilize when making application to the Next Policy Framework for the AAFC Oat Breeding Program in Brandon, MB. The current funding expires on March 31, 2023.

Mathieson participated in two industry consultations sessions held by the Canadian Roundtable for Sustainable Crops regarding the development of a voluntary Code of Practice for the production of cereals. POGA emphasized that any practices developed must be feasible and in the best interests of producers, in order for the agricultural industry to prove and demonstrate its care and commitment to the environment. Find out more at: <https://responsiblegrain.ca/about-us/>

Shawna Mathieson, in association with SaskCrops, met with the Canadian Grain Commission (CGC) in September to discuss grain contracts. Topics included non-regulated options that may be available, and whether the CGC is able to assist with the process of creating more transparent and fair contracts.

Mathieson met with a senior official at CN in July to discuss the anticipated increased demand for grain transportation. POGA encouraged CN to be ready for intensified grain movement this fall.

Oat Varieties Developed for Canada's Diverse Growing Conditions Breeding Project Update

In the 2021 Fall issue, the Oat Scoop provided an update on the project: *Breeding, genomics and agronomy research to improve oat yield and quality*, being led by Dr. Weikai Yan, Agriculture and Agri-Food Canada (AAFC) Research Scientist. The work is part of a larger, Canadian Field Crop Research Alliance (CFCRA)—AAFC Oat Project. Dr. Kirby Nilsen, Prairie Oat Breeding Consortium (POBC) Lead and AAFC's Brandon Research and Development Centre Research Scientist/Oat Breeder is collaborating in a portion of the study and represents the prairie region. The project will end in 2023.

Dr. Yan shares, "The oat breeding procedure we have used sets a good example of dealing with genotype-by-environment-interaction by breeding for mega-environment-specific adaptation." Breeding lines are first tested in sites located in each of the three oat mega-environments (ME) across eastern and western regions of Canada, followed by testing selected lines in their respectively adapted ME. This procedure led to the release of three new oat cultivars, one for each of the three MEs in early 2022.

The research team is also using genomic selection (GS) to select promising, new cultivars, which is based on genetic markers that cover the whole genome of each breeding line. This process is compared to visual selection (the conventional method for cultivar development). GS is conducted by Drs. Nick Tinker and Wubishet Bekele based at AAFC's Ottawa Research and Development Center, and they work with the AAFC oat breeders.

Dr. Nilsen shares, "We are increasing the use of a yearly test called ENCORE, which is a pre-registration test established in 2013 and conducted at four locations covering eastern and western Canada. Each breeder submits the most promising lines from the advanced stages of their programs and we see how well they do across multiple environments in eastern and western Canada. The best performing lines are then advanced into the registration tests in different MEs (for western Canada, this is the Western Cooperative Oat Registration Test)."

Nilsen continues, "This is a good example of how public breeding programs collaborate to develop new and improved varieties for producers and the industry for all regions of Canada. We are looking at traits like agronomic performance (yield and yield stability), grain and compositional quality (including beta-glucan content), and disease resistance."

ENCORE was formed by three public oat breeding programs led by Drs. Weikai Yan, Aaron Beattie, and Kirby Nilsen, respectively. The CFCRA-oat project also has a nation-wide agronomic component coordinated by Dr. Baoluo Ma based in Ottawa.

Dr. Yan's project objective #6 involves the ENCORE/North American joint oat breeding and testing portion of the project and includes the western Canada breeding programs. *Updates (in italics):*

- 210 oat lines from three breeding programs were tested in ENCORE at: Ottawa, ON; Brandon, MB; Lacombe AB; and, Saskatoon, SK, with two replicates. Data of grain yield, agronomic traits, grain and nutritional quality

traits, and diseases were obtained at all four locations and shared with all breeding programs.

- Molecular genetic maps continue to be uploaded to GrainGenes (a genome data base) as they are produced by the oat research community.
- The MS Access database, created to hold all of the information regarding mapped oat genes, QTL (Quantitative Trait Loci), and RGAs (Resistance Gene Analogues), is being used to produce the final versions of the inventory. Dr. Nilsen shares, "The team is constructing a database to be able to identify markers and genes for economically important traits in oat. This process will be greatly simplified using the oat genome sequence."

In addition to the ENCORE portion, a number of other experiments were conducted across Canadian testing sites, including western Canada:

- Determine site-specific, most economic rate of N (included Yorkton, SK, and Lacombe and Beaverlodge, AB).
- Determine the best N fertilizer type, rate and application methods (included Melfort, SK).
- Determine the optimum seeding rate (included Melfort and Yorkton, SK, and Lacombe and Beaverlodge, AB).
- Conduct crown rust and smut resistance screening (included Morden, MB).

Other significant objectives and results that will be fulfilled by project end include:

- Develop an oat-production guide (cultivar- and region-specific production guide on nitrogen rate, method, and planting density if results warrant).
- Quantify the efficiency of genomic selection (GS) versus visual selection, and development of a genotype and phenotype GS data base for use in future oat breeding within Ottawa and Brandon oat breeding programs.
- Conduct a survey for different races of crown rust pathogen virulence and host resistance genes.

Dr. Nilsen summarizes the preliminary results in the western region: "The genomic selection results are encouraging. We have seen good predictive ability to identify some of the best and worst performing lines for grain yield. Looking ahead, we need to fine tune our method to include other important traits so that we are able to select and improve not just yield, but a complete package of traits expected from producers and industry."

Dr. Tinker says, "It is an exciting time to be in oat research. As we see the complete oat genome finally published in the prestigious journal *Nature*, and as we embark on the analysis of the oat *Pan Genome*, it is equally gratifying to see that this long-term genomics work is also having direct impact on the development of improved Canadian oat cultivars. The world is taking notice of oat products, and the research world is talking notice of oat science. I look forward to watching what happens next."

This project is funded in part by the Government of Canada under the Canadian Agricultural Partnership's AgriScience Program, a federal, provincial, territorial initiative. Funding is also provided by POGA and many industry partners.

Back to School for SaskOats

Ag in the Classroom (AITC) In-school Nutrition Program—With Oats

SaskOats have been supporting AITC Nutrition Programs for some time now. This year, SaskOats partnered with Bob's Red Mill to provide three times the financial support for the oat-based portion of the schools' activities, which meant three times the number of schools were able to take part!

SaskOats is also a Hero sponsor of Ag in the Classroom, providing money for their general education programs.

The SaskOats board extends sincere thanks to Bob's Red Mill for helping to make the hands-on oat program a resounding success!

A total of 30 schools across Saskatchewan (selected from 51 applications) benefitted from the oat bursaries:

- \$400 bursary—14 urban and 6 rural schools (totaling 5,610 students)
- \$300 bursary—4 urban and 6 rural schools (totaling 1,349 students)

When advertising the program, AITC took a directed approach to promotion. Because universal nutrition programs aren't offered at every school, AITC contacted superintendents from several school divisions and asked them to distribute the application information to schools that would most benefit from the program.

Each school received a poster that included information on oat production and nutrition. In addition, recipe cards featuring Oat Crumble Muffins and Granola Bars were distributed to each school for students to take home. The cards also provided a list of 'bite-sized' facts about oats.

Each school decided how it would use the bursary. Some choose to extend their nutrition programs with oats (such as offering oat foods in their breakfast program). Others chose a single event or day to celebrate oats as part of a healthy diet. One high school Biology class researched oats and made oat muffins for the whole school.

SaskOats Chair Chris Rundel affirms, "The board believes in the value of supporting in-school nutrition programs that promote the benefits of Canadian-grown oats for students and their families. SaskOats was incredibly pleased to partner with Bob's Red Mill this year. We are always impressed to learn about the creative ways schools apply the bursaries."

The following examples from teachers' reports illustrate the diverse ways the bursary is used and the value of this program to teachers and students:

- St. Augustine School, Regina - Quick oats were purchased for breakfasts, and served with blueberries and maple syrup - kids LOVED it! Quick oats were also taken on the outdoor education excursion for a healthy breakfast. Our whole school was served a complimentary oat muffin for a snack one day.
- Dr. Brass Elementary School, Yorkton - For part of the funding, we topped up our school food pantry with oats-based products for our families that are experiencing food insecurity. We purchased granola bars, oatmeal and oatmeal cookies. We also provided school snacks in classrooms of granola bars and fruit.
- W.J. Berezowsky Public School, Prince Albert - One of our staff members looked up some oat-based recipes

and made some at home. She had her students taste test them to see which ones would be the best for our school. Once they figured out a great granola recipe, some grade 7 students made granola bars for the school as a snack. Students loved them!

- Watson School, Watson - The bursary funds were used to purchase oatmeal, cereal, and oat-based breakfast bars and cookies for our ongoing breakfast program. We offer breakfast to every student, regardless of socioeconomic standing. Everyone is able to start their day with a good breakfast in a judgement-free zone.
- A teacher from Shellbrook School - It was so great to see our students come together to share a meal first thing in the morning. Heading to class with a tummy full made a huge difference to their ability to focus on learning with a positive attitude!

Lastly, we want to share a message from one of the students who took part in the program: *"I love being able to have fresh muffins in the morning. It makes me start the day with a smile because I am not hungry."*



Students at Watson School, Watson SK: Extending thanks for the oat products (in the background), purchased with the AITC bursary.

SaskOats Supports Farm & Food Care Saskatchewan MEALS FROM THE FARM

SaskOats partnered with Agriculture in the Classroom Saskatchewan (AITC) for the Farm & Food Care Saskatchewan (FFCS) Meals From the Farm program. In June, six Saskatchewan schools enjoyed a hot lunch provided by Saskatchewan farmers.

FFCS and AITC arranged for the lunch and provided snacks and activities to help students and teachers learn more about how food is produced. A packet of oat seeds and planting instructions, provided by SaskOats and Grain Millers Canada, was included in 1,679 packages which were handed out to school participants.

Partner schools were: Thomson Community School, Regina; Dr. Brass Elementary School, Yorkton; Westview Public School, Prince Albert; Caswell Community School and Saskatoon Mayfair Community School, Saskatoon; and, Jack Kemp Community School in Lloydminster. The project was very successful and covered by several media outlets throughout the province. Monitoring reports also indicated worldwide media reach of 10.97 million views through television, print and online media.

Carbon Footprints in Saskatchewan Cropping Systems

Project Update

POGA introduced a new project in the 2021 March Oat Scoop entitled *Collecting the carbon data needed for Climate-Smart agriculture in Saskatchewan*. Dr. Kate Congreves, the project lead, is Associate Professor and Environmental Agronomy and Horticulture Researcher with the University of Saskatchewan Plant Sciences department.

Dr. Congreves states, “Determining the carbon footprint of various industries is an important component of provincial, national, and international sustainability initiatives. Crops produced with a low carbon footprint have a competitive advantage in the global marketplace. At this time, there is no direct annual data on net carbon footprints for Saskatchewan cropping systems—only modelled estimates. The ultimate goal of this research is to provide data to help producers with cropping decisions to ensure the competitiveness of Saskatchewan agriculture.”

The original objectives for the project (*progress-to-date for each objective in italics*) are as follows:

1. Provide direct, year-round, field-scale measurements of greenhouse gas (GHG) emissions from a representative cropping system in Saskatchewan.
 - *Measurements were collected in 2021; data filtering and analysis is in progress. The nitrous oxide (N₂O) data has been filtered and analyzed from 2018-2021 and the write-up is in progress. Note: 2021 data is being used in conjunction with previous data for the 2018-2020 period for a fuller dataset and to provide a longer-term picture.*
2. Test the hypothesis that Saskatchewan cropping systems are a net carbon sink¹ by determining net ecosystem exchange and carbon (C) footprint. ¹*A net carbon sink absorbs and stores more carbon than it emits.*
3. Provide field-scale assessments that encompass 4R+ practices aimed at minimizing C footprints. *POGA note: 4R+ are best management practices (BMP). Fertilizer application is based on specific regional conditions and appropriate timing. 4R stands for the right source, rate, time and place. Plus(+) stands for a ‘whole system’ approach to address habitat, soil health and drainage management and may encompass a variety of actions to focus on specific issues.*

The key component of the carbon footprint is the N₂O data. Preliminary results and key observations are:

- *Annual cumulative N₂O emissions have been relatively low over the past few years, most likely due to persistently dry conditions. Nonetheless, overwinter emissions (November to March each year) and spring thaw (April) represent a sizable portion of annual cumulative N₂O emissions (i.e., 29% to 71% of annual emissions, depending on the year).*
- *Neglecting the overwinter period (November to March) would underestimate the annual N₂O emissions by a considerable amount, even here on the prairies where it is cold for long periods of time. Despite the small daily fluctuations in N₂O during the cold winter, they do add up to constitute a net source of emissions.*

One noteworthy factor known to impact regular emissions is the vapour pressure deficit (VPD). This measurement is

the difference between the amount of moisture the air can hold and the amount of moisture in the air at any given time.

Dr. Congreves notes, “Interestingly, the VPD appears inversely related to N₂O emissions at spring thaw (April). When the VPD was high during the spring thaw (or a dry melt), emissions tended to be lower. This might be a new way of looking at N₂O production during spring thaw and may explain why prairie cropping systems have been experiencing lower than expected N₂O emissions during spring thaw. We will explore this concept further by calculating soil potential evaporation dynamics.”

The team will continue to monitor and collect data, and analyze each year’s data throughout the project life. While none of the results or observations to date can be used to make any conclusions at this time, the project is already producing information of interest to the researchers.

POGA will update producers on interim and final reports. Dr. Congreves has been sharing project information through agricultural magazine interviews/articles; presentations to science-based audiences; a journal publication; a university course; and, as a career workshop panelist. The four-year project concludes in 2024.

This project is funded by the Agriculture Development Fund (ADF) of Saskatchewan under the Canadian Agricultural Partnership, a federal, provincial, territorial initiative, and co-funded by Saskatchewan Oat Development Commission (SaskOats), Saskatchewan Canola Development Commission (SaskCanola) and Saskatchewan Wheat Development Commission (Sask Wheat).

Your AOGC Board at Work

- Darwin Trenholm, AOGC Vice Chair, attended the Calgary Stampede Agriculture and Agri-Food reception on July 13, hosted by The Honourable Nate Horner, Alberta Minister of Agriculture Forestry and Rural Economic Development.
- Jason Wiese, AOGC Director, participated in the July 11 roundtable hosted by The Honourable Nate Horner, Alberta Minister of Agriculture Forestry and Rural Economic Development, to provide input on issues affecting producers prior to the Federal Provincial Territorial Meeting of Canada’s agriculture ministers held later in July. Discussion focussed on concerns around linking environmental programs to Business Risk Management Programs, federal carbon pricing, and environmental policies. Wiese also emphasized POGA’s advocacy for a science-based approach to regulatory decision-making.



Enjoy a complimentary drink. Selection includes a Free Oat Beer from Battle Creek Brewery!

Annual General Meeting

Monday, January 23, 2023; 6:00 pm
(the Monday before CrossRoads)

The Edmonton Westin; 10135 100th Street; Edmonton, AB T5J 0N7
Devonian Room

AGENDA*

- 6:00 pm Complimentary Drink Plus a Light Meal
- 6:30 pm Welcome from Alberta Oat Growers Commission—Brad Boettger, Chair from Tofield, AB
- 6:35 pm AOGC Annual Business Meeting,** including Director Elections/Aclamations and AOGA Bylaws—Brad Boettger, Chair
- 7:00 pm What Are the Advantages and Disadvantages of Using Oats in Beer and Why We Chose Oats—Ryan Pearson, Owner and Brewer, Battle Creek Brewery
- 7:30 pm Nutritional Advantages of Oats and Opportunities for Plant-Based Milk and Meat Product Development—Dr. Lingyun Chen, University of Alberta
- 8:00 pm Oat Market Outlook—Ryan Denis, Director of Farm Advisory at Farm Business Network
- 8:45 pm Adjourn—Brad Boettger, Chair

*Times and agenda topics subject to change. Check poga.ca for updates.

**Please note: a 30-day notice for resolutions is required at the Alberta Oat Growers Commission Annual General Meeting. Please send any resolutions to smathieson@poga.ca no later than 5 pm, Dec. 23, 2022.

For those who stay through the end of the meeting, AOGC will provide another complimentary drink ticket.
Please RSVP to info@poga.ca to ensure enough food is ordered. There is no charge for this event.
If there is demand, AOGC will offer virtual participation. Please contact info@poga.ca if you would like to participate virtually.



Director Nominations Open

Are you interested in becoming a director or do you know someone who is?

Here are just a few of the benefits:

- Identify and direct research to benefit the entire industry.
- Increase industry knowledge.
- Opportunity to meet influential millers, buyers and government officials provincially, nationally and internationally.
- Information sharing with other growers.
- Professional development.
- Reimbursement for all travel and honorarium for time spent on Commission projects and committees.

A registered producer means any producer who has had an Alberta Oat Growers Commission service fee deducted since August 1, 2020.

Deadline for nominations is 5 pm MT, Thursday, December 8, 2022.

For nomination forms and further information contact:
AOGA Administration Office, PO Box 20106, Regina, SK S4P 4J7
Telephone (306) 530-8545; Email smathieson@poga.ca.



Enjoy Free SK Beer + Free Entrance to the CPW Show for all Producers that come to the AGM!

Annual General Meeting

Wednesday, January 11, 2023; 9:00 am - noon

Hall E (separate entrance for ease), Prairieland Park; Saskatoon, SK

Free Admission and Free Entrance to the CPW Show after the AGM!

AGENDA*

- 9:00 am Meet and Greet with coffee, tea, fruit and muffins
- 9:20 am Opening Remarks from SaskOats Chair—Chris Rundel from Foam Lake, SK
- 9:30 am The Effect of Variety and Fertility on Grain Quality and Yield of Milling Oat—Mike Hall, Research Coordinator, East Central Research Foundation
- 9:50 am Side Banding Versus Seed Placement of Fertilizer: What is Most Effective in Oats?—David MacTaggart, Northeast Ag Research Foundation, Associate Research Manager
- 10:10 am SaskOats Annual Business Meeting**—Chris Rundel, Chair
- 10:30 am Oat Market Outlook—Marlene Boersch, Mercantile Consulting Venture Inc.
- 11:15 am Adjourn Meeting—Chris Rundel, Chair
- 11:15 am Social Hour with Free Saskatchewan Beer

*Times and agenda topics subject to change. Check poga.ca for updates.

**Please note: As per prior years, a 30-day notice for resolutions is required at the Saskatchewan Oat Development Commission (SaskOats) Annual General Meeting.

Please send any resolutions to smathieson@poga.ca no later than 5 pm, December 11, 2022.

SaskOats plans to offer virtual participation. Please contact info@poga.ca if you would like the link and login details to attend virtually.



Enjoy a Free Oat Beer from Lake of the Woods!

Annual General Meeting

Wednesday, February 15, 2023

12:10 pm

Victoria Inn Hotel and Convention Centre

Winnipeg, MB

(as part of The CropConnect Conference - Free Admission to AGM)

AGENDA*

- 12:10 pm Lunch is Served
- 12:20 pm Welcome from MOGA Chair—Yves Lapointe from Ste-Agathe, MB
- 12:25 pm MOGA Annual Business Meeting**—Yves Lapointe, Chair
- 12:40 pm Oats, Why We Use Them and How They Make Our Beer Better—Chris Marsh, Brew Master, Lake of the Woods
- 1:10 pm Adjourn—Yves Lapointe, Chair

*Times and agenda topics subject to change. Check poga.ca for updates.

**Please note: A 30-day notice for resolutions is required at the Manitoba Oat Growers Association Annual General Meeting.

Please send any resolutions to smathieson@poga.ca no later than 5 pm, January 15, 2023.



25th Annual Conference

Thursday, December 1, 2022

Sheraton Cavalier, Saskatoon, SK

Please join us on **Wednesday, November 30 at 8:00 pm** for a **Meet-and-Greet** at the **Top of the Inn—Sheraton Cavalier**.

AGENDA

7:45 am	Registration and Free Hot Breakfast
8:25 am	Welcome and Introduction— Jenneth Johanson, POGA President
8:30 am	Oat Market Outlook— Jonathon Driedger, Vice-President, Leftfield Commodity Research
9:15 am	POGA Annual General Meeting— Jenneth Johanson, POGA President
9:45 am	Stimulating Germination and Emergence of Wild Oat, Volunteer Oat, Barley and Wheat— Dr. Shaun Sharpe, Research Scientist, AAFC
10:15 am	Networking/Coffee Break
10:45 am	Oats Everyday: Expanding the Canadian Oat Market— Robynne Anderson, Emerging Ag President
11:45 am	Hot Lunch
1:00 pm	Fertilizer Overview and Outlook— Josh Linville, Vice President – Fertilizer, Stone X
2:00 pm	Understanding the Impact of Particle Size on Physicochemical Properties and Nutritional Benefits of Pulse and Oat Flour— Dr. Yongfeng Ai, University of Saskatchewan Associate Professor and Carbohydrate Research Chair
2:30 pm	Oat Processing Expansion: The Changing of Agriculture—Meeting the Demands of the Socially Conscious Consumer of the Future— Murad Al-Katib, AGT Foods President and CEO
3:15 pm	Networking/Coffee Break
3:45 pm	Stop Acting Your Age, Boring isn't a Business Requirement— Matt Havens, Generational Expert
5:00 pm	Wrap-up and Adjourn— Jenneth Johanson, POGA President
5:45 pm	Social Hour at the Sheraton Cavalier
6:30 pm	Dinner and Presentation— POGA: 25 Years in Review—What Has Changed (or Maybe What Hasn't)!
8:00 pm	Program Ends. See you in 2023 at the Winnipeg Delta Hotel on Wed., December 6!

Daytime seminars, breakfast and lunch: \$20.00 (\$25 at door)
Optional Evening Banquet \$50.00 (\$60 at door)

**Times and agenda topics subject to change. For updates, pre-registration and credit card payments - visit poga.ca*

Call the Sheraton Cavalier (306-652-6770) or use the '**Book Your Room**' link on poga.ca to secure the negotiated rate of \$165 (plus fees) per night.
The room block closes on November 9, 2022!

The Oat Scoop
P.O. Box 20106
Regina, SK
S4P 4J7