

### A New Intercropping Project ♦ Oats and Canola Welcome Peas to the Field!

Saskatchewan producers have embraced field pea crops for a variety of reasons. For one thing, pea crops provide another opportunity for more diversity in crop rotation. They also fix nitrogen (N) in the soil, feeding the following year's crop and reducing producers' fertilizer input requirements.

Recently, pea has also received attention as an intercrop for certain grains. These crops exchange obvious, observable benefits with one another when grown as companions. For instance, strong and upright oat or canola provide support for the peas to grow up their stalks, reducing lodging in the pea crop. One way pea reciprocates is by fixing N in the soil, which reduces the amount of fertilizer a producer needs to apply to the current crop and any crop grown the following year.

Saskatchewan Oat Development Commission (SaskOats) has committed to support Dr. Kui Liu in his study to further break down and investigate this topic in a research project entitled *Intercropping pea with canola or oat: impact on nitrogen, disease and economics*. Dr. Liu is an Agriculture and Agri-Food Canada (AAFC) Research Scientist at the Swift Current Research and Development Centre.

Project objectives are to:

1. Determine effects of intercropping pea with oat or canola on grain yield, quality and soil health.
2. Quantify N transfer from pea to oat (mycorrhizal crop) or canola (non-mycorrhizal crop) and N recovery at different N rates.
3. Assess effects of intercropping on disease.
4. Evaluate economic returns of intercropping.

Researchers have observed mutual advantages displayed during intercropping projects but more research needs to be done to consider all the factors. For instance, when oats are companioned with pea and when compared to an oat monocrop, increased oat quality has been observed (e.g., not only yield, but groat percentage, plump seed and protein content). What properties of both pea and oat might be responsible for these results?

These increases in quality and quantity not only affect the crop itself but can also improve and amend the soil for future years. Dr. Liu states, "The improved quality and quantity of straw from the intercrops likely affect straw decomposition, soil carbon and N dynamics, and soil health. In this study, the effects of intercropping on soil-soluble carbon and N will be determined." Dr. Liu's team will use second-year wheat crops following the first-year intercrop plots to help determine potential carry-over effects.

*More intercropping project articles to come! Keep an eye out for the summer issue, where we'll bring you an article on the Oat-Pea Intercrop Demonstration trial conducted by Lana Shaw, South East Research Farm (picture below).*



Oat and canola are different in many ways. One variance that the team will quantify will be the difference in N transfer between pea-to-oat and pea-to-canola. Liu shares, "Oat is a mycorrhizal crop while canola is a non-mycorrhizal crop. The extent of N transfer from pea might be different because mycorrhizae play an essential role in N acquisition and transfer." (POGA note: mycorrhizal crops' root systems have a mutually beneficial, symbiotic relationship with fungus.)

Even though pea may not require N application, growing certain crops with pea does not eliminate the need for fertilizer application to benefit the non-pea crop. However, intercropped pea appears to utilize the applied nitrogen in enhanced ways when compared to a pea monocrop and Liu's team will also look into this.

Three different N fertilizer rates will be used and various N-related measurements will be taken (percentage of N derived from the atmosphere, N fixation, N transfer during the growing seasons, plant N uptake, and N recovery efficiency by plant).

Liu's team will also assess major diseases of all three crops, including root rot and mycosphaerella blight in pea, blackleg and sclerotinia in canola, and crown rust in oat. Dr. Liu provides some examples of things they will look for: "Root rot of pea might be suppressed by intercropping with canola via glucosinolates<sup>1</sup> and their breakdown products, isothiocyanates, potentially 'bio-fumigating' the soil and killing pathogens. Foliar diseases might be lessened due to reduced host density. Non-host crop plants may block wind-blown spread of foliar pathogens." This, of course, could result in decreased pesticide inputs. (POGA note: <sup>1</sup>glucosinolates are components high in sulphur and nitrogen which play a role in defending Brassicales (such as canola) against pests and disease.)

To ensure intercropping with pea makes financial sense to producers, the team will also calculate annual net revenues for sole- and inter-crops by subtracting production and input expenses from gross revenue. Dr. Liu concludes, "Sensitivity and risk analysis will be conducted with different input and commodity price levels to investigate the robustness of the findings."

Dr. Liu's project collaborators include: Dr. Michelle Hubbard, Agriculture & Agri-Food Canada (AAFC) Swift Current; Dr. Tony Yang, AAFC Swift Current; Dr. Haben Asgedom-Tedla, AAFC Saskatoon; Dr. Jeff Schoenau, University of Saskatchewan, Soil Science Department; Dr. Mohammad Khakbazan, AAFC Brandon; Dr. Diane Knight, University of Saskatchewan, Soil Science Department; and Lana Shaw, South East Research Farm (SERF), Redvers.

The study will be conducted at three Saskatchewan research sites (Swift Current, Melfort and Redvers) to take different climate zones into account.

Field trial findings will be shared by conducting tours at the sites. Experimental results will be presented at scientific workshops and conferences. POGA will also update producers on interim and final reports in the newsletter and on POGA's website. The three-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.

## Alberta Oat Varietal Trials<sup>®</sup> High Yields for Producer Profits Functional Properties for Millers' Needs

POGA has been providing annual support of the project entitled *Increase the Oat Acres in Alberta by Finding a High Yielding Oat Variety that Maximizes Producer Income and Meets the Demands of the Millers*, conducted by Sandeep Nain, General Manager of Alberta's Gateway Research Organization (GRO).

Prior to 2015, the main oat varieties grown in Alberta were Morgan and Derby, which are high yielding but low Beta-glucan ( $\beta$ -glucan) content compared to newer varieties. Nain explains, "A minimum of 4%  $\beta$ -glucan is required for food manufacturers to be able to label their products with the Heart Healthy Claim and both Morgan and Derby are consistently below that amount. Since 2015, we have received financial support to conduct this varietal trial to identify oat varieties that yield well in Alberta growing conditions and also contain  $\beta$ -glucan content that will help Alberta producers access the milling market more consistently."

Alberta producers want to include oats in their rotation, for many reasons. Nain continues, "Oats provide disease and insect breaks for wheat, barley and canola. They provide excellent weed suppression. They take up and store excess nitrogen and the straw provides a nutrient source for the following year's crop. The straw also protects against soil erosion and increases the soil's organic matter content. Well-planned management and

appropriate selection of variety make oats a profitable crop due to their low input requirements and favourable effects on succeeding crops in a rotation."

A project to evaluate varieties that perform well for both Alberta farmers and Canadian millers provides producers with the information they need to keep oats in their rotation.

Test sites, as always, were at Westlock and Peace Region. The growing season experienced high moisture throughout.

The same varieties were grown and analyzed as last year. To assess the overall qualities, measurements were taken for yield, height, lodging, test weight, thousand kernel weight, hull percentage, flour moisture,  $\beta$ -glucan, days to maturity.

For all five years, location and variety has a significant effect on oat yields and  $\beta$ -glucan levels. Nain provides some general information for 2020 results: "Oat yield overall was great with higher levels of  $\beta$ -glucan in most oat varieties at Westlock. The environmental conditions affect a variety's yield capacity to a higher degree than  $\beta$ -glucan levels. For example, the higher  $\beta$ -glucan varieties were the same at both Westlock and Peace Region locations but the same oat variety yield was different for both locations."

Interested readers can visit [poga.ca](http://poga.ca) 2020 Research for all details of the project and results. Here are some result highlights:

Highest performers Highlighted	Westlock		Peace Region	
Variety	% of AC Morgan	Yield bu/ac	% of AC Morgan	Yield bu/ac
AC Morgan	100	203	100	211
CS Camden	104	211	87	183
CDC Seabiscuit	101	205	93	196
OT3112	105	213	85	180
CDC Ruffian	101	206	98	207
AC Summit	87	178	86	181
AC Arborg	102	208	94	199
CDC Endure	96	194	97	206
CDC Skye	104	211	93	196
ORE3542M	90	183	93	197
CDC Norseman	93	190	90	190

**Table 1: 2020 Yield Comparison**

Top 3 Varieties at Westlock (overall qualities)			
2020	OT3112	CDC Endure	CDC Skye
2019	CDC Endure	CDC Arborg	AC Morgan
2018	CDC Endure	CDC Arborg	Triactor
2017	CS Camden	Akina	CDC Ruffian
2016	CDC Seabiscuit	CDC Ruffian	CDC Orin
Top 3 Varieties at Peace Region (overall qualities)			
2020	CDC Skye	OT3112	CDC Endure
2019	CDC Seabiscuit	CDC Arborg	CS Camden
2018	Triactor	AC Morgan	CDC Endure
2017	CDC Ruffian	CS Camden	CDC Orin
2016	CDC Ruffian	AC Morgan	CDC Seabiscuit

**Table 2: 5-Year Comparison of Top 3 Varieties (considers all desired qualities)**

...continued: Alberta Oat Varietal Trials

Darwin Trenholm, Alberta Oat Growers Commission Vice Chair and producer from Newbrook, AB, shares his opinion of the AB Varietal Trial: “The information provided in the annual reports are of great value to help producers determine which variety to choose for the upcoming years. The comparison charts are easy to read and evaluate how each variety might perform in the Alberta growing regions. It’s good to see how newer varieties compare to some of the older varieties we’re all familiar with.”

Prairie Oat Growers Association (POGA) and Grain Millers Canada provides financial support for the project.

### **Integrated Crop Agronomy Cluster (ICAC)®**

Western Grain Research Foundation (WGRF) is leading a collaborative agricultural research endeavour which takes a multi-disciplinary/facility approach to address problems faced by Canadian farmers.

*The Integrated Crop Agronomy Cluster consists of eight research activities ranging from soil health to herbicide resistance and climate change adaptation. It also includes the coordination of crop insects and disease monitoring, assessing and managing spray drift, developing a risk model for mitigating Fusarium Head Blight, development and management of productive, resilient and sustainable cropping.* For more information, go to WGRF’s July 12/18 announcement:

<https://wgrf.ca/uncategorized/new-integrated-crop-agronomy-cluster-announced/>

POGA has committed financial support to several ICAC projects and, as always, will be updating producers in the Oat Scoop. Please see the next article for an example of one of the ICAC projects for which POGA has designated funds on behalf of oat producers.

## **Monitoring Insects on the Prairies®**

### **Helping Producers Deal with Pests**

Producers all contend with insects that affect their crops. However, they’re not alone; government and other agricultural industry service groups have been working for years to help farmers predict and control these pests. For instance, the Prairie Pest Monitoring Network (PPMN) was established over 20 years ago to provide a framework for collaboration and multidisciplinary research efforts across the Prairie Provinces.

POGA has committed to support Dr. Meghan Vankosky’s five-year project (ends 2023): *Coordinated Monitoring of Field Crop Insect Pests in the Prairie Ecosystem*. The financial support flows through Western Grains Research Foundation’s (WGRF) Integrated Crop Agronomy Cluster (ICAC). Dr. Vankosky is a field crop entomologist and researcher with Saskatoon Research and Development Centre, Agriculture and Agri-Food Canada (AAFC).

Dr. Vankosky explains, “The PPMN consists of a core group of entomologists from across the prairies. It is co-

chaired by Jennifer Otani (AAFC-Beaverlodge) and myself. Others involved in the PPMN are: Dr. Owen Olfert (the previous project co-lead, now retired from AAFC-Saskatoon) and entomologists from Alberta Agriculture and Forestry, Saskatchewan Ministry of Agriculture, and Manitoba Agriculture and Resource Development. The provincial entomologists utilize collaborator networks including Alberta Agriculture Fieldmen, individual growers, Saskatchewan Ministry of Agriculture Agronomists, the Saskatchewan Crop Insurance Corporation, and many others. The PPMN also collaborates with entomologists at academic institutions to conduct research to refine and develop monitoring methods and protocols, generate biological data, and establish economic thresholds.”

Project objectives are to:

1. Conduct annual monitoring of pest populations across the prairies to keep the Canadian agriculture industry informed of risks posed by insect pests.
2. Ensure timely response to new invasive pests with regulatory implications by reporting finds to the Canadian Food Inspection Agency.
3. Develop, refine, and use various tools and models to predict threats, estimate insect impacts on yields, and understand the impacts of climate change on insect pests.
4. Highlight the role of natural enemies and make recommendations to conserve beneficial insects.
5. Communicate results to end-users, including agronomists and farmers, using new and existing platforms, such as the Prairie Pest Monitoring Network website and Weekly Updates.

Vankosky continues, “Because insect distribution and forecast maps need to be updated annually to ensure that models remain relevant and applicable, the activities of the PPMN will continue as in the past 20 years, but will also evolve as needed to address new threats (e.g. swede midge and canola flower midge) and respond to changes in agricultural production (e.g. restricted neonicotinoid availability).”

Insect surveys conducted in 2019 (from 3,142 locations across MB, AB, SK and the BC Peace River Region) provided 2020 forecasts for grasshoppers and wheat midge, and distribution maps for cabbage seedpod weevil, pea leaf weevil, wheat stem sawfly, bertha armyworm, diamondback moth, *Lygus* spp., and beneficial insects.

In addition, the potential for migratory pest species (e.g., diamondback moth, leafhoppers and cereal rusts) was assessed using wind trajectory data (in collaboration with Environment and Climate Change Canada).

Whenever the PPMN team detects potential insect threats, such as invasive species, they immediately report their findings to CFIA and also post information via PPMN Weekly Update e-Bulletins. Producers can subscribe to the growing season weekly updates at [prairiepest.ca](http://prairiepest.ca). An example of an update that would be of particular interest to oat producers can be found in the 2020 Week 15 update (<https://prairiepest.ca/2020/week-15/>).



Toward the bottom of the post is a feature entitled *Oat Pests / Feature Entomologist: Héctor Cárcamo*, by Finch Van Baal. The Oat Pests section provides links to several monitoring and scouting protocols, as well as economic thresholds (where available).

The team also shares information via PPMN working group meetings and presentations at various meetings and conferences, and has also published an article in a peer-reviewed scientific journal (Environmental Entomology).

This five-year project (ends March 2023) is funded through the AgriScience Program as part of the Canadian Agricultural Partnership, a federal, provincial, territorial initiative. Industry funders include: Prairie Oat Growers Association, Western Grains Research Foundation, Saskatchewan Wheat Development Commission, Manitoba Crop Alliance, Alberta Wheat Commission, Saskatchewan Pulse Growers, Manitoba Canola Growers Association, Saskatchewan Canola Development Commission, and Manitoba Pulse and Soybean Growers. 2020 Oat Breeding Program Update

### **Dr. Aaron Beattie Oat Expert Extraordinaire! ♦**

POGA extends hearty congratulations to Dr. Aaron Beattie—recipient of the University of Saskatchewan's **2020 Dean's Award for Excellence in Outreach and Engagement**. Aaron is a well-known oat breeder at the University's Crop Development Centre.

He has now, however, been officially recognized as going 'above and beyond' for the industry he serves.

Here is an excerpt from the University's selection announcement letter:

*The selection committee is pleased to recognize your outstanding contributions to outreach and engagement with a wide range of partners.*

*Committee members commented that before they reviewed your nomination, they felt they knew what you had been doing and had achieved, but they were surprised and simply blown away by your application. The amount of work that you have been doing with external stakeholders is simply astounding, and you seem to do it effortlessly. It is also very clear that outside organizations trust you and have come to depend on you, because you have supported them so well in the past. The committee was impressed with your long list of activities, and also took note of the strong letters of support from local and international industry players. It is clear that your work has become integral to many businesses involved in the production and postharvest processing of oat and barley. You have reason to be proud!*

Because Aaron has been such a valuable asset to the oat industry, POGA was proud to be one of the organizations to provide a letter of recommendation for him to receive this award.

Congratulations, Dr. Beattie for this well-deserved award!

## **University of Saskatchewan Crop Development Centre (CDC)**

Dr. Aaron Beattie, CDC Oat Breeder, states: "2020 was a very challenging year due to COVID-19. From March through May, the CDC oat breeding program operated with only half our staff at work; however, our remaining staff worked from home setting up seed which allowed us to finish all spring seeding by late May.

*We had good growing conditions at all nine western Canada locations where we grew our breeding trials and as a result we received a lot of good data.*

*Over the course of the summer we grew and evaluated about 7,000 yield plots and about 20,000 early generation lines.*

*Diligent focus is placed on increasing yield and lodging resistance, decreasing height and maintaining good physical grain quality (kernel weight, plumpness and test weight) along with good milling yield, high beta-glucan and protein and lower oil.*

*We continue to maintain good crown rust, smut and FHB resistance, and are looking to improve stem rust resistance in our varieties.*

*A promising new line will be put forth for registration in 2021. OT3112 shows high yield potential (equal to or better than AC Morgan and CS Camden), shorter straw than CS Camden, very good lodging resistance, excellent kernel weight and plumpness, very high milling yield, higher beta-glucan than all other varieties, along with crown rust and smut resistance.*

*We also saw a big increase in CDC Arborg acres in 2020 with a lot of positive comments from growers. CDC Arborg is also on the recommended list for Grain Millers, General Mills and Richardson Milling; Quaker only recently started plant-scale milling trials."*

## **Successful Oat Marketing Campaigns ♦ In Canada, Mexico and Japan!**

Oat Scoop readers are being kept up to date on a regular basis as to POGA's various marketing campaigns. Next issue, the 2020 statistics will be available and we will provide a year-end wrap up article. POGA is very pleased with progress to date. Here's a short overview of the Key Performance Indicators (KPI) and how they compared to the goals set at the beginning of each project.

The **Canada campaign** started in September 2020 and ends March 31, 2021. The campaign's message is a simple one: Canadian oats are wholesome food for Canadians. The original **Oats Everyday** website was revived and the social media platforms are where the majority of the 'analytics action' happens. As of the end of January, 2021 the analytics reveal that almost all KPIs have already been exceeded:

**Social Media Impressions:** represent the total number of times a specific post appears on users' screens. This includes the original post viewed—plus the number of times it reappears because of shares with friends,

...continued: Oat Marketing Campaigns

discussion interaction, etc. The KPI goal for impressions was set at four million (over the life of the project). The number of impressions reached, with two months remaining in the project, is almost five million (119% of the KPI goal).

**Social Media Engagements:** represent all user actions taken (e.g., post views, likes, video view, shares, etc.). The actual number of engagements is an impressive 259% of the KPI goal and indicates people really liked the content they were seeing, and were keen to dive into the content and share it with others.

**Social Media Following:** indicates the number of people who actively choose to follow an account. The campaign has achieved 78% of the KPI goal—with two months remaining in the project.

Another exciting result of all the social media activity above is that the *Oats Everyday* website has seen a big boost in traffic because Canadians are really catching on to the message that home-grown oats are not only versatile (they can be used for more than just breakfast cereal)—they're also very good for you.

It's not too late for producers to take part and help make this project achieve even greater success. Jump on any of the platforms, become a follower, and share the good oat news and recipes with friends and family: Facebook (@OatsEverydayCA), YouTube (Oats Everyday), Instagram (@Oats\_Everyday), Pinterest (@Oats\_Everyday), and the website (oatseveryday.com).

The **Mexico campaign** (Avena Canadiense) has been active since 2015; the most recent project term ends April 1, 2021. As Oat Scoop readers know, this has been a very successful campaign and has included more than just on-line social media activity. Mission trips to Mexico resulted in POGA interaction with the Mexican Diabetes Association (oat-related health education and cooking school activities), an annual Oat Recipe Contest and awards ceremony at the Canadian Embassy in Mexico City, and meetings with government officials and industry representatives.

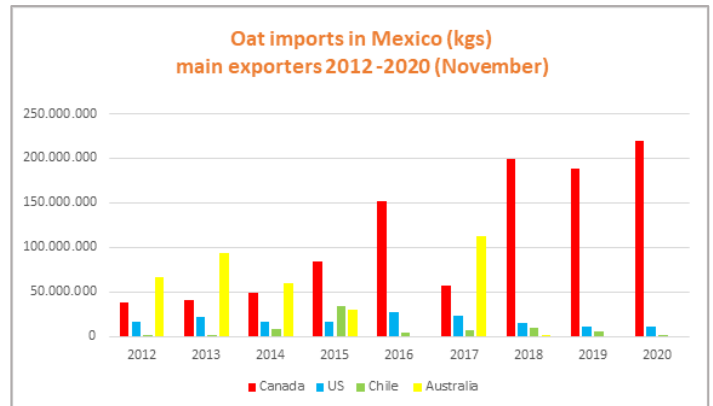
The social media campaign set one aggregate KPI for website and social media views (which includes page views and reach). The activity to January 31, 2021 achieved 238% of the KPI goal. Things don't appear to be slowing down at all, as January 2021 saw a significant increase in Facebook activity.

Food bloggers in Mexico continue to create popular recipe videos. Two new recipes posted in January received excellent response. Viewers aren't looking just for recipes, either. Informational blogs (such as the one written by the Mexican Association of Nutrition) are shared on the Facebook page and they, too, are very well received.

The website continues to chalk up increasing traffic and activity. The YouTube channel continues to grow organically (organic refers to free post content, which may indicate that the content is attractive enough to users without needing a boost by way of paid ads).

While all this talk about on-line activity is exciting, how does the effort relate to Canadian oat imports in Mexico?

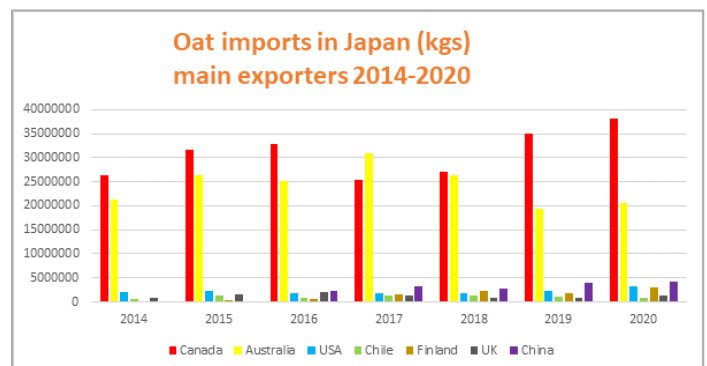
The following chart shows how Canadian oats have been doing in Mexico over the past nine years (2020 numbers are to November).



The **Japan campaign** term began July 1, 2020 and ends April 1, 2021. To say it got off on a good foot would be an understatement. Because of its short-term nature, one KPI goal was set: social media reach on Facebook (which refers to the number of people the content reached). The campaign reached over five million (a whopping 10,496% of the original goal)!

Oat is not a well-known food ingredient in Japan. However, the Japanese are willing to embrace new foods and place priority on healthy food choices. POGA is working to promote the health benefits of, and diverse ways to cook with, Canadian oats.

Insofar as oat imports in Japan, the following chart indicates that demand has been increasing for both raw and processed oats (2020 numbers are to the end of December).



By all indications, the value of promoting healthy Canadian oats to the Japanese market is undeniable.

POGA plans to continue marketing campaigns in Canada, Mexico and Japan (pending federal funding approval of applications POGA has submitted).

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

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### Scott Shiels, Grain Millers Canada® SaskOats AGM Presentation January 12, 2021

The SaskOats AGM was held virtually this year (as part of CropSphere 2021). On the agenda was Scott Shiels, Grain Procurement Manager, Grain Millers Canada Corp. Scott shared what occurred in the 2020 oat production year from the oat milling industry's perspective, as well as things to look out for in 2021 and beyond.

2020 Canadian seeded oat acres increased 6.5% compared to 2019; Saskatchewan's increase was 3.3%. Hot, dry weather in late July/early August negatively affected the high yields and test weights that were anticipated. Canadian oat production was up 8% over 2019 (a per acre increase in production overall).

The five-year average calculates a 19% oat production increase (4.576 MMT) (it has nearly doubled in the last 10 years—2010 production was 2.451 MMT), with demand still exceeding supply.

What is creating that demand? Oat-milk and gluten-free products are responsible for much of that. (See past Oat Scoop newsletters for the many articles detailing POGA's financial support for oat milk, creamer and other product research.)

Over the last three years, demand for oat milk products has doubled year-over-year. As with all new products, increasing demand will begin to lessen as these popular products are created and begin to fill the shelves; but still, a robust 50% increase is projected for 2022.

Oat-milk coffee creamers are very popular and, as Oat Scoop readers know, Starbucks and other coffee shops are praising oat-milk (developed especially for baristas) for its taste, foaming qualities and oat's reputation as a sustainable crop.

Ice cream and yogurt alternatives made with oat-milk have recently arrived on shelves and are becoming very popular. (See the 2020 June Oat Scoop: *New Foods from Healthy Oats* for more about POGA's support of Dr. Lingyun Chen's project, which includes doughnut, ice cream and pasta product development research.)

Other oat-milk alternative products, such as 'whipped cream, cream cheese, sour cream and cheese' are coming soon. Shiels states, "The sky is the limit on growth with these products."

Canadian oat exports have seen a healthy increase for 2020-21 and are continuing to climb. So, considering all the positive current and potential demand for oats, what messages does Shiels have to share? Here are some presentation points regarding pricing opportunities:

- Supplies are very tight (like 2019-20).
- Buyers and millers are more aware of the supply crunch, which will lead to higher prices earlier in the crop year (unlike 2019-20).
- Producers should be taking advantage of traditionally high prices (e.g., Minneapolis oat price offers are trading at the highest level since 2014 November).
- New crop values for 2021-22 are already pushing close to old crop prices; producers should take advantage of new crop prices at \$3.50+.
- Strong oat prices will likely lead to increased acreage in 2021 spring, which would point to lower pricing later in the crop year.

A few other things Shiels suggests producers watch for:

- Barley and wheat pricing and new crop acreage.
- Corn prices in the U.S.
- Ending stocks estimated to be ~550,000 MT (below the 650,000 MT average).
- Demand could slow if COVID restrictions ease off and consumers are eating less at home.
- USDA final production is 'bullish' for wheat, soy, corn.

SaskOats thanks Scott for his view from the millers' vantage point!

### Oat Breeding at the Brandon Research Development Centre® What's New, Hot and Coming Soon

Dr. Kirby Nilsen, Research Scientist and Prairie Oat Breeding consortium (POBC) program lead, gave a presentation at MOGA's February 10, 2021 AGM. Dr. Nilsen works in Sustainable Oat Breeding and Genomics, Agriculture and Agri-Food Canada (AAFC) Brandon Research and Development Centre (BRDC).

The goal of the BRDC Oat Breeding Program is to develop milling oat cultivars for Western Canada (for conventional and organic production). The objectives include the following: agronomics (e.g., yield, maturity, height and lodging); grain quality (e.g., beta-glucan, protein, plump and uniform kernels, test weight (TWT), thousand kernel weight (TKW)); and disease resistance (e.g., crown rust, stem rust, smut, barley yellow dwarf virus (BYDV), Fusarium head blight (FHB)).

Some of the recent and popular oat varieties developed in the BRDC program include: AAC Douglas (OT2122); AAC



...continued: Oat Breeding at BRDC

Justice (OT2084); Summit (OT2045); and Leggett (OT2021).

The latest variety, AAC Douglas (developed in 2019 under Jennifer Mitchell-Fetch's lead at BRDC and distributed by SeCan), is a stand-out. It combines:

- good yield with early heading and earlier maturity;
- high TWT and TKW;
- a better groat percentage than test average (and AC Morgan);
- excellent protein and beta-glucan content;
- acceptable total dietary fibre, average oil content; and,
- good features—resistant to smut; moderately resistant to oat crown rust and FHB.

In addition to the varieties listed above, two organically bred varieties developed by Mitchell-Fetch were recently accepted via the standard Canadian registration process and licensed through Grain Millers: AAC Kongsore (OT8006) and AAC Oravena (OT8003).



OT 2129: a promising BRDC candidate variety

Nilsen mentions characteristics he likes for OT2129, a promising new candidate variety for 2021 (developed by K. Nilsen and J. Mitchell-Fetch). Features include:

- good yield potential (104% of Summit);
- early heading and earlier maturity than Summit (which has been a popular variety with producers);
- shortened height with very good lodging resistance (same height as Summit);
- very high groat percentage;
- good beta-glucan content; and

- Acceptable disease package with intermediate resistance to stem rust, and FHB, and BYDV resistance (based on 2019 data only).

Oat Scoop readers will recall Nilsen's intention to focus on genomics-assisted breeding strategies (see June 2020 issue article: *Meet Kirby Nilsen, Research Scientist* for more information). Nilsen shares, "Genomics are a valuable tool in the breeder's toolbox. Genomics-assisted breeding allows us to make more efficient breeding decisions, helping to respond to grower and industry needs."

## YOUR POGA BOARD AT WORK

☑ **Jenneth Johanson, POGA President**—an excerpt from **Real Agriculture's Agronomy Geeks, Episode 19** podcast introduction: *Johanson shares how her horizons have been expanded, transitioning from part of the board to leading a board, realizing the immense amount that a grower association does for its members, and the seemingly basic question of, "Why oats?"*

<https://www.realagriculture.com/2021/01/agronomy-geeks-ep-19-jenneth-johanson/>

☑ **ADAMA** (crop-protection company) January 2021 **lunch and learn** session. **Jenneth Johanson** presented: *POGA's vision and mission; POGA's funding priorities; and, current research and marketing projects highlights (including the Mexican marketing campaign success).*

☑ **Hot Topics in Commodities** by **Glacier Farm Media**. The free sessions each feature a look at market demand and fundamentals provided by MarketsFarm analysts as well as a presentation on a current production issue. **Oats** are featured on **April 1, 2021**. **Dr. Kirby Nilsen** will join **Jenneth Johanson** in this presentation. **Check it out!**

<https://www.producer.com/news/online-series-covers-hot-topics-in-commodities/>

☑ **Joy of Oats** conference January 2021 presentation by **Shawna Mathieson, POGA Executive Director**: *POGA's current projects, successes, and marketing gains in Mexico and Japan; producers' perspective on average returns/acre of various crops in SK and MB; and, oat industry concerns (including loss of research funding, transportation, carry-out stocks and oat pricing, and the reduction of pre-harvest glyphosate use acceptance (and the subsequent challenge to grow oats).* This was a special, on-line event hosted and attended by the oat industry sector to facilitate information dissemination of our favourite topic: oats!

☑ **Garry Johnson, SaskOats/POGA Director** **interview** with Jeff Melchior, Grainews—Glacier Farm Media: **"Organic farming veteran offers some truth and tips."** *This article is a candid look at Garry and Geri Johnson's experience and knowledge they have accumulated over 20 years of organic farming.*

<https://www.grainews.ca/features/organic-farming-veteran-offers-some-truth-and-tips/>

## A Kid-L-Eat Oats, Too—Wouldn't You?♦

Producers grow oats to feed people—young and old. POGA supports Ag in the Classroom and we update readers on those outreach programs. We are always pleased to see students' positive responses to learning about oats and (even better) preparing and eating delicious, oat-filled fare at school.

Recently, **Janet Hainstock, Moose Jaw, Saskatchewan**, reached out to inform POGA of her children's story: *I Love Oatmeal*. Told from the perspective of a young boy, this short story illustrates how parents can nurture a child's palate for wholesome food by making learning hands-on and fun.

POGA congratulates Janet for having her story accepted for online publication in The Oat Newsletter (published by American Oat Workers)! The following link will take the reader to a page that provides a broad spectrum of oat-related information—for kids and adults alike: <https://oatnews.org/node/959>. There, you will find a link to Janet's story, as well as other articles of interest (including a YouTube link for a discussion of oat-pea intercropping, with Lana Shaw, South East Research Farm).

Also, be sure to take your kids over to the 'For Kids' section (<https://oatnews.org/node/935>) for some fun, educational activities and reading—all about oats!

## Uncovering More Goodness in Oats♦

### New Research Project - Beyond $\beta$ -Glucan

POGA is continually looking deeper into the many known health-related benefits of oats, and there is always more to know. To advance the study of oat nutrition, POGA is co-funding a project led by Dr. Sijo Joseph (Thandapilly), Research Scientist (Cereal Chemistry and Nutrition), Morden Research and Development Centre, Agriculture and Agri-Food Canada, Winnipeg. Dr. Joseph is also Adjunct Professor, Department of Food and Human Nutritional Sciences, University of Manitoba. He knows a lot about the nutritional aspects of not only cereals, but food in general.

Many people are aware of the particular health benefits associated with beta- $(\beta)$  glucan, a soluble fibre in oats. Dr. Joseph states, "Oat is also already appreciated as a high-quality plant-based protein source with improved sustainability<sup>1</sup> value. However, the specific health-promoting action of oat protein has been under-studied."

<sup>1</sup>*Oat is increasingly considered a sustainable crop due to many factors—predominantly, its role as a low-input rotational crop that conserves/improves soil conditions and its ability to control cumulative weed, pest and disease problems.*

Dr. Joseph continues, "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."

To obtain preliminary, proof-of-concept information, the team will conduct a pre-clinical feeding study using

experimental rats. Dr. Joseph will also investigate if there is an additive/synergistic effect on cholesterol and glucose levels due to both oat protein and  $\beta$ -glucan. (POGA note: a synergistic effect produces outcomes greater than the combined effects produced by each component separately.) In addition, he will also obtain the protein digestibility profile and break-down products of oat proteins in order to explore specific, potential health benefits of these bioactive components. The oat protein extract used will be obtained from the Canadian Food Innovator Cluster Oat Protein Project. (POGA note: Producers have been learning about the Innovator projects at POGA conventions, etc. For more information, please visit [canadianfoodinnovators.ca](http://canadianfoodinnovators.ca))

Information obtained from this project will be shared by report publication, presentations and media interviews. Dr. Joseph also plans to have AAFC Fact Sheets produced (which will summarize oat protein research and concepts) and make them available to the industry and public.

Dr. Joseph concludes, "This project essentially responds to current needs of the Canadian oats industry. Primarily, our study is expected to produce compelling novel information about the health benefits of oats protein. The results from this study will pave the way for conducting appropriate human studies to generate substantial evidence for health claims for oats protein."

The three-year project ends in 2023. This project is funded by Agri-Science program, Agriculture and Agri-Food Canada, POGA and PepsiCo.

## Stimulating Wild Oat Germination...♦

### ...and Why You Would Want To

Wild Oat (*Avena fatua* L.) is a notorious, prevalent weed in Canadian Prairie crops and is increasingly becoming harder to control. It is also a tough competitor and becomes even stronger when it emerges before the planted crop does.

Seed from wild oats is also resilient and its germination behaviour is hard to predict. It can remain dormant in the soil for years and emerge when conditions are 'just right' for it.

Herbicide application control methods are losing effectiveness due to the development of herbicide resistance in wild oats.

Saskatchewan Oat Development Commission (SaskOats) has committed to support Dr. Shaun Sharpe's research project entitled *Stimulating Germination of Wild Oat and Volunteer Cereals (Wheat, Barley, and Oats) from the Soil Seed Bank*. Dr. Sharpe is an Agriculture and Agri-Food Canada (AAFC) Research Scientist in Saskatoon. Dr. Breanne Tidemann, project collaborator working with Dr. Sharpe, is an AAFC Research Scientist in Lacombe, AB.

Why on earth would anyone want to *stimulate* weed germination?

One weed-control practice that was common in the past was to reduce wild oat (and other weeds) by allowing a window of opportunity for weed seed germination in the soil seed bank (called the stale seedbed technique). The germinated plants were either dealt with before planting



(plowing or herbicide application) or after harvest (allowing frost to kill the weeds before they have a chance to set seed).

This may be a good way to deal with herbicide resistant weeds. However, ensuring the maximum germination of wild oat at any given time is difficult, considering its tendency to germinate 'whenever it darned well wants to' and not necessarily on the farmer's time schedule. Because those wild oat seeds can remain viable for years, intentionally germinating as many as possible at one time can mitigate weed growth in the current year and perhaps future years as well.

Dr. Sharpe states, "If wild oat can be stimulated to emerge from the seedbank, it could reduce the overall infestation and the cost of additional herbicide inputs to combat resistance. While the effectiveness requires study, it could take one to several years for wild seed population to increase to meet an economic threshold that would require additional herbicide application to control wild oat, reducing herbicide inputs and cost."

Weeds are often agricultural plants that are simply growing where they're not wanted. How will Dr. Sharpe convince wild oat and other unwanted plant seeds to germinate on command? The project has one objective: Develop a stimulation cocktail for sprouting wild oat and volunteer cereal seed.

"The study will characterize the dose response, interaction and optimal mix of potassium nitrate and pyroligneous acid (liquid smoke) to determine the suitability of either pre-seeding or post-harvest germination stimulation of wild oat, volunteer barley, oats and wheat," shares Dr. Sharpe.

Sharpe's team will conduct the tests in both Petri dishes and pots filled with field soil, under precise and controlled conditions.

Research results will be shared at producer and academic conferences, meetings, etc., and, if feasible, for publication in scientific journals and agriculture media platforms. POGA will also update producers on the final report in the newsletter and on POGA's website. The one-year project concludes in 2022.

This project is funded by Saskatchewan Oat Development Commission, Saskatchewan Wheat Development Commission, and Manitoba Crop Alliance.

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## Tracking Carbon Footprints...<sup>◆</sup>

### ...in Saskatchewan Cropping Systems

Most people are familiar with the term 'carbon footprint' and know what the term means in general: the total greenhouse gas (GHG) emissions produced by an activity. GHGs are gases that collect in a layer in the atmosphere and trap heat between the earth and the gas layer.

GHG emissions are standardized and measured in 'megatonnes of carbon dioxide equivalent' (you may run across the abbreviations [Mt CO<sub>2</sub> eq] or [CO<sub>2</sub>e]). The word 'equivalent' represents a common measurement determined by comparing the GHG emissions produced

by any source to the amount that would be produced by one megatonne of CO<sub>2</sub>. This helps to present the global warming potential (GWP) of any other GHG type (e.g., methane, nitrous oxide (N<sub>2</sub>O) and fluorinated gases) relative to the warming potential of the common baseline example (GHG produced by one MT of CO<sub>2</sub>).

Over the past years, lists, charts and reports that compare the annual GHG emissions and GWP of many industry-based activities have been presented from various sources. Some information regarding certain industries is broken down by province or region within Canada. The next question might be: where does the data come from to determine a regional carbon footprint for any given industry? For instance, who is collecting measurement data annually for Saskatchewan grain production?

Saskatchewan Oat Development Commission (SaskOats) has committed to support Dr. Kate Congreves in a research project that addresses this question, entitled *Collecting the carbon data needed for Climate-Smart agriculture in Saskatchewan*. Dr. Congreves is Assistant Professor and Environmental Agronomy and Horticulture Researcher with the University of Saskatchewan's Plant Sciences department.

Congreves states, "Though a number of researchers have estimated carbon (C) footprints using various carbon models, there is no direct annual data on net C footprints for Saskatchewan cropping systems. One reason for this is that direct measurement of the parameters needed to determine the carbon footprint generally rely on the use of micrometeorological methods and, to date, no micrometeorological station devoted to direct measurement of the C footprint of cropping systems in Saskatchewan has been established."

A team of collaborators will work with Dr. Congreves. From the University of Saskatchewan: Dr. Richard Farrell, Department of Soil Science; Dr. Tristan Skolrud, Department of Agricultural and Resource Economics; and Dr. Warren Helgason, Department of Civil and Geological Engineering; and, from the University of Guelph: Dr. Claudia Wagner-Riddle, School of Environmental Sciences.

Objectives for the project are as follows:

1. Provide direct, year-round, field-scale measurements of GHG emissions from a representative cropping system in Saskatchewan.
2. Test the hypothesis that SK cropping systems are a net carbon sink by determining net ecosystem exchange and C footprint. (*POGA note: A net carbon sink absorbs and stores more carbon than the source 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.*)

## 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 [poga.ca](http://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.

*...continued: Tracking Carbon Footprints*

The team will be using the newly installed Micrometeorology Research Station at the University of Saskatchewan to provide spatially (based on location) and temporally (based on timing) integrated data to be used to make a number of important determinations (as outlined by Dr. Congreves):

- N<sub>2</sub>O and CO<sub>2</sub> emissions at the field scale that can be used to determine net ecosystem exchange (i.e., the balance between crop uptake of CO<sub>2</sub> [photosynthesis] and soil and crop respiration); and
- the net C footprint (i.e., cumulative N<sub>2</sub>O [expressed in CO<sub>2</sub> equivalents]).

N<sub>2</sub>O emissions are largely emitted from the soil—especially as it thaws after winter. Data collection from other provinces suggested that those emissions increase during thaws after a particularly cold winter. However, preliminary data collected by Congreves suggests that this is not the case at the University of Saskatchewan site. Says Congreves, “This implies that Saskatchewan might have a lower carbon footprint than other cropping regions in Canada; at present, however, the data needed to support this assertion is lacking—underscoring the need for research to determine the annual carbon footprint of representative Saskatchewan cropping systems.”

Congreves concludes, “This research will provide the first-ever direct measurement of overwinter N<sub>2</sub>O emissions in Saskatchewan, as well as field-scale assessments of fertilizer practices aimed at minimizing emissions and carbon footprint.”

Alan Butuk, SaskOats Chair and Insinger producer, shares, “Having access to real GHG-emission measurements in the Saskatchewan crop system will help the agricultural industry continue to work to flesh out the details of this topic as it relates to agriculture. This research ties nicely into the work of Fraser McPhee and others who are

endeavouring to expand the understanding of all the components associated with GHG/carbon capture in agriculture.” (POGA note: see the March 2020 Oat Scoop article Emissions in Agriculture for more information on Fraser McPhee’s work.)

POGA will update producers on interim and final reports and the project team will disseminate information through scientific publication and extension/outreach activities. The three-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, Saskatchewan Canola Development Commission and Saskatchewan Wheat Development Commission.

## Oat Advantage Breeding Program

### A Look Back and Into the Future

*Jim Dyck shares a summary of his breeding program.*

Oat Advantage has been in operation for over a dozen years now. The millers’ acceptance of our first two main oat varieties have allowed us to move into phase 2—the next dozen years. It takes a minimum of 10 years to develop an oat variety, then the variety needs to perform well on farms; but oat miller acceptance holds the key to its long-term success.

Our first two oat varieties, ORe3541M (41M) and ORe3542M (42M), are with SeCan. Combined sown acres reached over 100,000 in 2019 and over 200,000 in 2020. We thank General Mills, Richardson Milling, Paterson and Emerson Milling for trying and approving our varieties.

Two new Oat Advantage varieties will soon be available through Seed Depot Corp. The first to be released across western Canada will be ORe Level48 (OT6021). ORe Level50 (OT6016) will be made available a few years later.



2020 OAT ADVANTAGE plots at Codette, SK.

Both varieties are excellent for yield and quality and are part of our “Oats Re-Imagined” series. Both will be in the 2021 Provincial trials for the Prairie Provinces.

Our early oat variety (OT6007) for short season situations was named ORe6251M (51M) in 2017. It matures 7 to 10 days earlier than the average oat variety and yield is



...continued: Oat Advantage Breeding Program

comparable with current oat varieties when seasons are cut short. Results from conventional and organic testing in the AB Peace River region and in a field scale organic test near Shellbrook, SK also show promise for 51M.

The grain quality of 51M is very good, with higher-than-average levels for beta glucan, protein, and total digestible fibre. Seed size, percent plump and test weight are excellent. Lodging resistance is fair. Though stem strength isn't high, oat growers with considerable agronomy experience will be able to use this variety to their benefit. We are currently seeking a home for this unique oat variety for both commercial and organic production settings.

A high-yielding, high-quality Oat Advantage line, OT6024, will go through Plant Breeder's Rights trials this summer and next. This oat variety was supported at the registration meetings in 2019. We hope to begin seed production of this promising oat line on our farm in summer 2021.

New milling oat lines will be entered into the Western Cooperative Oat Registration Trial (WCORT) in 2021 including one that tested high for protein. Other, promising 'dual-purpose' oat lines will also be entering the WCORT. Forage trial, grain yield, and grain quality data since has confirmed nutritional value and grain production of these various lines.

Our hulless oat breeding program gained good momentum in 2020. Having completed the first year of

WCORT testing, it is exciting to see hulless oat lines HOT602 and HOT603 with 23% and 12% higher yield, respectively, over AC Gehl. Testing through Discovery Ag Research at Codette, SK in 2020 showed HOT602 yielding up to 140 bu/acre (Morgan was around 200 bu/acre). When 20% for oat hull equivalent weight is factored in, HOT602 yield is 170 bu/acre.

Field yield success in each Canadian prairie region remains a focus. In order for western Canada to continue to produce the best oats in the world, on-going research is needed to develop heavy, nutrient laden, highly uniform, optimally shaped groats, inside the thinnest possible, but still durable, oat hull.

With the support of General Mills, we purchased a 'lab-sized' gravity table. With this tool, we won't have to de-hull oats in order to check how heavy the groats and hulls are to make improvements.

SeCan extended support for our oat research by providing a new Wintersteiger combine—just before 2020 harvest was well underway.

The Prairie Oat Growers Association has supported the purchase of software and equipment such as a root scanner (2009), belt thresher (2013), and the 'Kicker' (2017). Most importantly, POGA's financial funding has been instrumental in taking our breeding program from a start-up to where we are now: putting profit-focused oat varieties bred specifically for the Prairie regions into the hands of producers. A breeding program takes more than a decade to establish—this is just the beginning!



## Annual General Meeting

Thursday,  
April 8, 2021  
1:00 pm

**Location:** Due to COVID-19, the AGM will be held virtually via Zoom.

Please RSVP to [info@poga.ca](mailto:info@poga.ca) and check [poga.ca](http://poga.ca) for the meeting documents.

Times and agenda topics subject to change  
—check the website for updates.

### AGENDA

- 1:00 pm Welcome from the AOGC: Chair - Brad Boettger, Tofield, AB
- 1:05 pm AOGC Business Meeting\* including director election/acclamation, financial reporting and project updates
- 1:25 pm Chris Newbergher, Grain Marketing Specialist, Stony Plain Seed Cleaning
- 2:00 pm Adjourn

## 2021 Census of Agriculture

Producers are reminded that in May 2021, Canadian farm operators will receive a letter from Statistics Canada with instructions on how to complete the census questionnaire online.

## SAVE THE DATE!

### 24<sup>th</sup> POGA Annual General Meeting

Fairmont Banff Springs  
Banff, AB  
December 1, 2021

For hotel reservations call  
**1-403-762-6866**

or

**1-800-441-1414**

for the special rate of  
**\$179 per night (plus \$14/person/day)**

Reserve under:

**POGA Annual General Meeting**  
**POGA reservation block closes on**  
**November 9, 2021.**

**Watch [poga.ca](http://poga.ca) for more details**

## In Memory of Lorne Kyle



It is with sadness that POGA learned charter Director Lorne Kyle and his wife, Rose-Marie, passed away on December 24, 2020.

Lorne Kyle was one of the Manitoba farmers who attended a meeting in Ituna, SK in early 1998 (organized by the Foam Lake and Kelleher Marketing Clubs and the Alberta Oat Association) to consider forming a

prairie-wide oat producer group to promote the advancement of oats.

As a result of the Ituna meeting, the Prairie Oat Growers Association was formed—with Lorne Kyle as one of the directors. In December of 1998 the inaugural POGA Annual Convention was held in Saskatoon. Subsequently, the POGA directors recognized that provincial groups representing oat producers had to be formed in order to develop provincial support for a prairie-wide organization and secure sustainable funding through provincial levies on oat deliveries. Lorne Kyle was one of the first directors of the Manitoba Oat Growers Association (MOGA).

As a director Lorne Kyle worked diligently to:

- use his political connections to encourage Members of the Legislature to support the MOGA submission for a provincial levy;
- arrange producer meetings at various locations throughout Manitoba;

- attend POGA board meetings;
- sell memberships to potential MOGA members;
- encourage producers to support MOGA and POGA;
- encourage producers to serve as directors; and,
- encourage members of the oat industry to support POGA by becoming associate members.

Lorne Kyle developed an interest in plant varietal development in the years he was employed as a lab technician at the Federal Research Station in Morden, MB.

He served for many years as POGA's representative on the Prairie Grains Development Committee which reviewed all new oat varieties submitted for registration and decided which varieties would be supported for registration.

Lorne will be remembered affectionately by thousands who attended Ag Days in Brandon as "The Cookie Man"—responsible for arranging the baking and delivery of hundreds of dozen of oatmeal cookies which were handed out from the POGA display.

Lorne Kyle gave freely of his time and energy to many causes in agriculture, politics, service clubs and community ventures, all for the greater good.

### RECEIVE THE OAT SCOOP ELECTRONICALLY!

Simply go to the home page at [www.poga.ca](http://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.



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