

The FENCE POST

Fall/Winter 2023 Issue No. 7



MANITOBA
CROP
ALLIANCE

ALL EARS

Tracing the origins
of Manitoba's grain
corn industry

INSIDE: Plant peptides show promise p. 18 Crop profiles p. 26

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The FENCE POST

Editor-in-Chief
Cole Christensen

Creative Director
Brent Morrison

Contributing Writers
Ashley Ammeter, Derek Brewin, Alankrita Goswami, Alison Inglis, Madison Kostal, Robert Misko, Pam de Rocquigny

Cover Photo
Courtesy Toban Dyck, Burr Forest Group

Publisher
Cole's Ag Communications

Printing & Distribution
Houghton Boston



Chief Executive Officer
Pam de Rocquigny

General Inquiries

Phone: 204-745-6661

Fax: 204-745-6122

Email: hello@mbcropalliance.ca

Address: P.O. Box 188, 38 4th Ave. NE, Carman, Manitoba, R0G 0J0

EXPLORE The New MBCROPALLIANCE.CA

*Have you visited our website lately?
If so, you might have noticed things look a little bit different.*

We spent several months thinking about ways to make the information we share with researchers, industry stakeholders, consumers and our farmer members more engaging and accessible. The result is a site that looks and functions better than ever.

Check it out today!



Science is science

Both science and technology play a leading role in farming, and it is important to acknowledge, support and defend it.

Nowadays, nearly all farming operations rely on science and technology every day, whether it's GPS and auto-steer, sectional control on drills and sprayers, soil testing, or advancements in plant breeding and genetics. Across the board, the impact on yields is evident.

Although Mother Nature still rules, technology and scientific advancements have enabled farmers who embrace this progress to grow better crops. This was especially evident during the last two drought years, when farmers were able to grow adequate crops despite the dry conditions they had to endure.

Minimal and zero till have allowed farmers to conserve moisture, fertility rates are targeted for better yields and there is supplementary information available to help improve fertilizer, weed and insect management.

Take glyphosate or any other chemistry, for example. Through numerous tests and trials, years of data and testing research, this chemistry has been proven to be safe and effective. As



farmers, we choose to use it because it is to our advantage.

However, the possibility of a different outcome than desired has to be expected and accepted. If you believe in good, sound science, you have to accept both positive and negative outcomes. We cannot manipulate science to do what we want or try to get it to do what we desire. Even if we do not favour the results, we have to acknowledge and accept sound scientific research and outcomes. All scientific outcomes need to be shared and learned from to enable the continued growth of our industry.

Take a minute to reflect on how your operation has changed and improved over the past few decades. Those

changes did not happen overnight, they were a result of significant time and effort within the scientific community.

The advances in agriculture over the last 20 to 30 years, such as improved plant genetics, new hybrid varieties of corn or canola, fertilizer options, spray options or machinery advancements, are all thanks to science. Scientific exploration laid the foundation for the technology used every day across Canadian farms.

It is for these reasons that farmers and the agriculture industry as a whole need to put a certain amount of faith and trust in science. We remain supporters of and contributors to this vital discipline. For the future sustainability of agriculture, it is essential to embrace science – celebrating the breakthroughs, and even the setbacks, along the way. Only through sound scientific investigation will our industry flourish. 🌱

Robert Misko
Chair
Manitoba Crop Alliance



A “New Deal” for Canadian agriculture

I started my career in Manitoba's agriculture industry with the provincial government in February 2001. It was there I was introduced to the five-year funding structure used by Canada's federal, provincial and territorial governments to support the Canadian agriculture industry. Early in my career, it was called the Agricultural Policy Framework. This was followed by Growing Forward, Growing Forward II, the Canadian Agricultural Partnership and now the Sustainable Canadian Agricultural Partnership (SCAP), which began earlier this year.

The makeup of these five-year agreements has changed significantly since the early 2000s, particularly through the lens of research and the AgriScience program. I have witnessed a transition from industry-led objectives to increased government influence in the direction of funding. There have been increasing costs prescribed by government as part of the funding application, as well as application review delays that extend well past the anticipated start dates for new projects, which creates uncertainty and risk for funders and researchers. There have also been rejections of research activities, even after workplan approvals and stringent scientific reviews have been completed prior to submitting applications. Changes in the government-industry funding split have been equally troubling, going from a 70:30 ratio (government to industry) to



60:40 or even 50:50, depending on the research activity.

As the leader of an organization committed to funding variety development, I was shocked by the federal government's decision in SCAP to limit activities related to breeding and variety development. This is particularly shortsighted when you consider that breeding can help the government meet its environmental sustainability targets.

As they are now constructed, these five-year funding programs are not as attractive as they once were. When funding for our farmer-driven research priorities is inextricably connected to the policy agenda of the government of the day, and comes with so many strings attached, we need to re-evaluate these investments — both in terms of dollars and organizational capacity.

The contributions both levels of government are making to agriculture research are valued, and we

understand the application process is a competitive one. However, now is the time to start thinking about what the next five-year partnership will look like when it begins in 2028. We need governments to collaborate with commodity organizations to advance the agriculture industry and ensure Canadian farmers remain competitive on the world stage. We need the federal government to recognize a one-size-fits-all approach does not work because our industry is diverse — what works in Western Canada might not work in Eastern Canada, and what works for canola might not work for wheat.

Governments must engage with farmers to find out what their operations need to be successful. When farms are successful, everyone along the value chain benefits. Farmers are willing to share their knowledge and experiences, but governments must be willing to listen and learn. Only then can they build and implement a program that delivers.

By working together, farmers and governments can ensure the next funding partnership moves Canadian agriculture forward.

A handwritten signature in black ink that reads "Pam de Rocquigny".

Pam de Rocquigny
CEO
Manitoba Crop Alliance



Explore our enhanced crop profiles

We recently expanded the information we share as part of our crop profiles on mbcropalliance.ca. With the help of LeftField Commodity Research, we have added new facts and data for each of our crop types, including annual seeded acreage and production, crop and export values, top export markets, end uses and more. This data is shared in an

interactive and accessible format to help researchers, consumers and industry stakeholders gain a better understanding of wheat, barley, corn, sunflower and flax production in the province and the significant economic contribution these crops make to Manitoba and Canada as a whole.

To complement the information on our website, we also created print supplements for each crop type that can be downloaded or printed for offline viewing. — *MCA Staff*

To view our enhanced crop profiles, visit mbcropalliance.ca/market-development-access/crop-profiles.

Meet Our Staff — Andrew Hector

Meet the newest addition to our dedicated and passionate MCA staff: Andrew Hector!

Andrew joined the team in August as our new agronomy extension specialist — cereal crops. He holds a master of science in environmental science from the University of Guelph and a bachelor of science in agroecology from the University of Manitoba. He also brings experience working in both the private and public sectors across multiple provinces to his new role. Much of his work has involved investigating



the effects of different cropping systems on soil health properties in agroecosystems.

Andrew loves the interconnected and welcoming nature of agriculture and looks forward to working co-operatively with industry, governments and researchers to learn more about the challenges and opportunities facing cereal production. When he's not working, he can be found playing tennis, hiking, mountain biking, camping, or playing card or board games with friends and family. — *MCA Staff*

CWRC transitions host duties; appoints new president

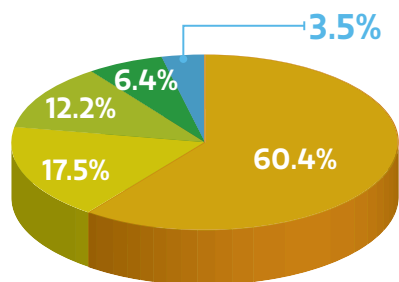
In May, we assumed hosting duties for the Canadian Wheat Research Coalition (CWRC) from Alberta Grains (formerly the Alberta Wheat Commission).

As part of this transition, Lori-Ann Kaminski, MCA's research program manager — cereal crops, was appointed as the new CWRC president. The president, who is appointed from the host organization and approved by the CWRC board of directors, is the key contact for external stakeholders.



The CWRC's operational hosting duties rotate every three years between the three Prairie producer organizations who represent wheat farmers in Alberta, Saskatchewan and Manitoba: Alberta Grains, the Saskatchewan Wheat Development Commission and MCA. Hosting duties include administrative functions, such as research funding co-ordination; communications activities, such as website updates and annual reports; and planning and co-ordination of CWRC's annual general meeting.

The CWRC facilitates a collaborative approach to producer support of regional and national wheat research in variety development and agronomy. This has included administering the 2018-23 Canadian National Wheat Cluster under Agriculture and Agri-Food Canada's (AAFC) Canadian Agricultural Partnership and now the new 2023-28 Canadian National Wheat Cluster under AAFC's Sustainable Canadian Agricultural Partnership. — *MCA Staff*



2023-24 BUDGET EXPENSE ALLOCATION



2023-24 fiscal year budget

The MCA board of directors met on June 22, 2023, and approved the 2023-24 fiscal year budget.

For the 2023-24 fiscal year, the board of directors is projecting revenues at \$9,566,059 and total expenses of \$9,516,937. A small positive net balance of \$49,122 is projected. However, given the drought conditions experienced across Manitoba, the board will review the full budget, including levy revenue projections, at the December 2023 board meeting to determine if any revenue/expense should be adjusted accordingly. MCA is well positioned in the event of a deficit budget should levy revenues fall below projections.

Included within the 2023-24 budget is the renovation of the east side of the MCA building located at 38 4th Avenue N.E. This renovation will serve to meet the needs of the operations and staff of the amalgamated organization and create significant benefits for our farmer members and staff. Office functionality will be improved, including increased privacy for our cash advance clients who come to our office. The renovation is expected to be complete in February 2024. No substantial renovations have been made to the building since its construction in 2000. 🌱

Post-secondary bursary applications now open for 2023-24 school year

Manitoba Crop Alliance (MCA) offers six \$2,000 bursaries each year to assist with the financial needs of students who are enrolled in a post-secondary agricultural program within the province of Manitoba.

To qualify for a bursary, students must:

- *Have completed their first or second year of post-secondary education at the college or university level and be enrolled full-time for the 2023-24 school year in an agricultural program within the province of Manitoba*
- *Have achieved a minimum cumulative grade point average of 3.0*
- *Be from a farm that is a member in good standing with MCA*
- *Have not been previously awarded an MCA bursary*
- *Have an interest in wheat (spring or winter), barley, corn, flax or sunflower, or agriculture in general*

Applicants must submit an application letter and academic transcript. The application letter should be maximum of one page and should include the following information: (i) their connection to or interest in agriculture, (ii) why they

decided to enroll in an agriculture-related post-secondary program, and (iii) how they hope to contribute to the agriculture industry once they have graduated and are in the workforce. The application should also indicate the name of the farm the applicant is from, which must be in good standing with MCA.

The successful applicants will be announced at MCA's Annual General Meeting (AGM) on Feb. 15, 2024. They will also be featured on MCA's social media channels and in MCA publications, including The Fence Post and Heads Up.

Applications can be emailed to Madison Kostal at madison@mbcropalliance.ca with the subject line "MCA Bursary Application 2023-24" on or before Jan. 12, 2024, at 4:30 p.m. CST. Successful applicants will be notified by Feb. 9, 2024. – MCA Staff

This is an independent scholarship with a selection committee contracted outside of MCA. 🌱

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Five questions

with **Lori-Ann Kaminski**

Manitoba Crop Alliance Research Program Manager – Cereal Crops

1. Why did you choose to work in Manitoba's agriculture industry?

*I love agriculture. I trained in agriculture and have worked in agriculture and agriculture research-related employment for my whole career. When we moved to Manitoba for my husband's job as plant pathologist with Manitoba Agriculture, it was important for both of us that I also find a place where I could **contribute to Manitoba's dynamic agriculture industry**.*

2. What do you love most about Manitoba ag?

*The people in agriculture are amazing. They are creative at making improvements and **adapting to many challenges** and changing opportunities on the farm. I love digging into those challenges and opportunities.*

3. What do you think are the greatest challenges and opportunities the industry faces?

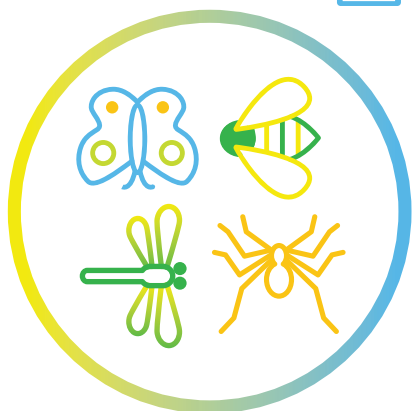
*I don't think the challenges are new, but they have intensified. There is a lot of pressure on farmers to produce food while providing a living for their own families through challenging economic and environmental conditions. As for opportunities, there are many changes coming, such as **new technologies and research advancements that offer increased efficiency and yield**. The challenge is translating those emerging opportunities into farm sustainability and profitability that works for Manitoba farmers.*

4. What is your favourite place in the world and why?

*That depends. I love to travel. I have had the great privilege to see Canada from coast to coast and almost to our northern coast. I have also traveled a bit in the U.S. and internationally, but in the summer, there is **no place better than Manitoba**. Berry picking and eating, fairs and festivals, lakes and rivers, camping and fishing, more garden produce – come on, what's not to love?*

5. What's a fun fact about yourself that people might not know or that might surprise them?

***I love bugs.** I know that's not a very popular statement and I don't always like what they do, but insects are fascinating. Besides, "insects did it first" – think Velcro, bungee jumping, paper manufacturing, silk, air-conditioned homes and don't forget honey! 🍯*



Half a Century of Tasselin

The growth of corn production in Manitoba

By Alison Inglis

Public Relations Specialist, Freelance

After planting the tiny seeds in the ground, it doesn't take long for little plants to emerge. Before you realize it, it's the first of July, and those plants have grown beyond knee-high. From there, they'll soon shoot up to eight or 10 feet high.

If you ask Shawn McCutcheon, a farmer from east of Carman, there is no feeling quite like combining a

field of corn that is yielding well and watching the corn roll into the hopper. This is a view he says he's had of corn ever since he started growing it in the late 1970s.

In 1970, grain corn seeded acreage in Manitoba was approximately 3,500 acres, according to Manitoba Agricultural Services Corporation (MASC). That figure has since grown to an estimated 554,000 seeded acres in 2023, according to Statistics Canada. That journey to 554,000 acres in Manitoba was unique.

The McCutcheon family has been farming outside Carman since 1901. In 1939, Sheldon McCutcheon bought the farm known today as McCutcheon Farms Ltd., and through most of

his farming career, sugar beets were the backbone of the farm.

Sheldon's son, Shawn, was eager to continue farming, and in 1975 put his first crop in the ground. He grew corn for the first time that year (silage) thanks to the encouragement of his dad. "He didn't think the future of sugar beets was particularly great in Manitoba, so he wanted me to grow a crop that he couldn't meddle in," he says.

Shawn, along with another local farmer who had been working with his dad, grew just over 500 acres of silage corn that year. They harvested it with a two-row forage harvester, and it turned out to be a great crop.

Continued on next page

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Shawn (left) and Warren McCutcheon are two of the three generations of corn growers in the McCutcheon family. Photo courtesy Toban Dyck, Burr Forest Group.



“It really is interesting the different places corn ends up — ethanol plants, feed mills, farms and feedlots.”

Shawn McCutcheon
Corn farmer

The following year they had access to a local dryer and ended up combining some of their corn. After drying, they had about 70 bushels an acre. Then, in 1977, the McCutcheons built a dryer on their farm and have grown corn for grain ever since.

One of the big attractions as corn acres started expanding in the 1970s was that it was considered a cash crop. “Farmers could grow it and get their money as they sold it, which was in contrast to some of the other crops we were able to grow at that time,” Shawn says.

At the time, Manitoba didn’t have the well-established, private agronomy community that exists today. The Manitoba Corn Growers Association

(MCGA) was formed in 1971 by a group of driven farmers with a vision to expand the corn industry in Manitoba.

The first Corn School and Corn Yield Competition were held that same year, providing basic agronomic and machinery information for farmers. Seagram’s (later acquired by Diageo) supported these events, incentivizing farmers to try growing corn that could fuel their distillery in Gimli.

Initially, a high percentage of corn produced in Manitoba was used on farm for livestock feed, as the dairy, cattle and hog industries grew across the Prairies.

Seagram’s created a big market for Manitoba corn when the distillery

opened, and they worked closely with farmers to establish a grain corn industry in the province. Husky's Minnedosa Ethanol Plant opened in 2008 and has since become another important market for Manitoba corn.

Today, there is a well-established corn buying community in Manitoba. "It really is interesting the different places corn ends up — ethanol plants, feed mills, farms and feedlots," Shawn says. "The marketing of corn has really evolved as the acreage has increased and more buyers have entered the market."

By 1978, grain corn acreage had made a major leap to 88,000 seeded acres. By 1980, it had soared to 130,000 seeded acres, but the new decade brought several new challenges. 1980 was a drought year, in 1982 it froze at the end of August, resulting in widespread quality issues, and in 1983 there was a European corn borer (ECB) infestation that devastated the crop in southern Manitoba.

In addition to weather events, pests and weed control, farmers had to juggle high interest rates among other business challenges, such as the threat of subsidized corn entering Canada. These challenges were soon reflected in corn acreage, which dipped during the late '80s.

Shawn was elected to the MCGA board of directors in 1987 and served for eight years, including three as president. During this time, the association worked closely with Ontario Corn Producers' Association and Producteurs de grains du Quebec to initiate a countervailing duty action against the U.S.

"In the early 1990s, we were being flooded with highly subsidized corn from the U.S.," Shawn says. "The countervailing duty action was a fascinating process, and although overturned, it brought the government's attention to the unlevel playing field as far as subsidies."

Soon, a duty was imposed on corn coming into Canada from the U.S. This trade action was attempted again in 2000 and 2006, and although neither bid was successful, they did boost the

price of corn while the interim duties were in effect.

Another achievement for the industry during Shawn's service on the board was advocating for the change to individual crop insurance coverage. "At that time, our coverage was 50 bushels an acre based on the provincial yield average," he says. "At the price of the day, \$3 or \$4 a bushel, this wasn't much coverage."

"We asked them to look into individual coverage. After a lot of time and effort, we were finally able to achieve that, and crop insurance coverage went up significantly in the corn-growing areas, from 50 to 80 or 90 bushels an acre."

Today, MASC provides individual insurance by calculating potential yields based on a farmer's 10-year yield history.

After the dip in acreage in the 1980s, corn acres didn't consistently rebound until the early 2000s, when they eclipsed 100,000 acres. In 2012, they jumped again to 300,000 acres.

Initially, farmers were limited to early season varieties grown in Ontario and Quebec. However, ongoing involvement from Canadian grower organizations, including Manitoba Crop Alliance (MCA), in corn agronomic research has

"In the early 1990s, we were being flooded with highly subsidized corn from the U.S. The countervailing duty action was a fascinating process . . ."

Shawn McCutcheon

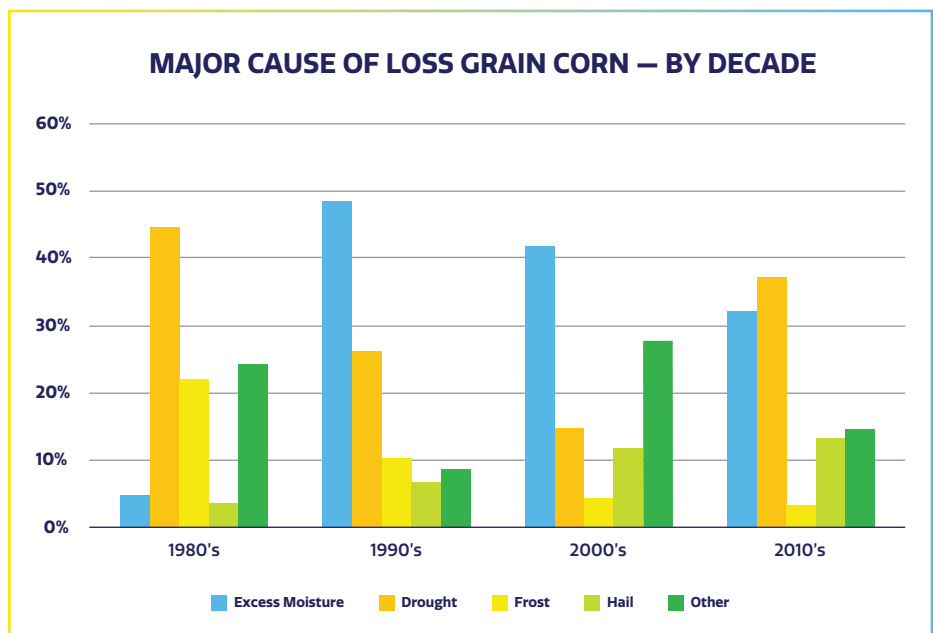


Figure 1: Major cause of loss in grain corn by decade. Other includes wind, heat, insects, disease, weeds, adverse weather, over wintering losses, cut for feed and cause of loss not stated. Data provided by Manitoba Agricultural Services Corporation.

helped improve the way farmers grow corn across the country and increased the adaptability of corn in regions like the Prairies, where the growing season is shorter.

Along with the rebound in acreage, Manitoba also saw a big increase in corn yields over the next two decades. The average yield was 93 bushels per acre (bu/ac) from 2000–2009, rising to 115 bu/ac from 2010–2019.

"A big portion of this yield increase can be attributed to the development of glyphosate-tolerant corn hybrids," says Anne Kirk, cereal crop specialist with Manitoba Agriculture. "Breeding programs have also made big advances in the development of high-yielding corn with corn heat units appropriate for Manitoba."

Glyphosate-tolerant corn hybrids were introduced to the market in 1998 and the Manitoba Corn Committee (MCC) has been testing them in performance trials since 2001.

Shawn's son, Warren, is the third generation on their farm. In 2006, he planted his first corn crop. The next

"Pioneer D97 was a game-changing variety, it just kind of blew the doors off everything for yield."

Warren McCutcheon
Third-generation farmer

year was the first the McCutcheons grew a glyphosate-tolerant variety, which proved to be a huge step forward for their operation.

"Pioneer D97 was a game-changing variety, it just kind of blew the doors off everything for yield," Warren says. "With the glyphosate tolerance, it was unbelievable. We made a 20- to 30-bushel jump."

Another game changer was the development and introduction of Bt corn technology in 1996. At one point, Shawn says, they were spraying corn fields once or twice a year by air with insecticides. "Now, we've got a simple gene in these corn plants that we don't have to worry about corn borer infestations anymore."

There had not been any field-evolved cases of ECB resistance in North America until it was found in Nova Scotia in 2018. This discovery triggered a swift reaction from many stakeholders across the Canadian corn industry.

Researchers from the University of Guelph and members of the Canadian Corn Pest Coalition are analyzing the situation in Nova Scotia to discover and promote best management practices that are applicable in areas like Manitoba. The current recommendation for farmers is to follow general resistance-management guidelines, including use of multiple modes of action.

Today, drought and excess moisture remain the primary causes of yield loss in grain corn in Manitoba.

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AVERAGE GRAIN CORN YIELD IN MANITOBA 1970–2022

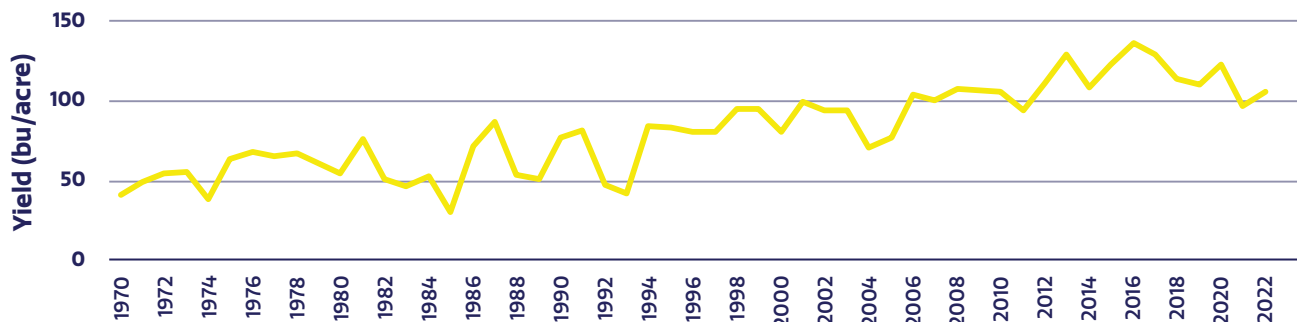


Figure 2: The average corn yield in Manitoba was 93 bushels bu/ac from 2000–2009, rising to 115 bu/ac from 2010–2019. Data source: Statistics Canada. Table 32–10–0359–01.

"Corn is a long-season crop, so we are trying to get out there early and to stretch our growing season as late as possible. We're faced with challenges in the spring and fall," Warren says, adding they've lost their top-end yield potential eight out of the last 10 years due to being short of moisture.

"The new varieties are more efficient — it seems they are doing a lot more with less. We've seen what these varieties can do a few years and how well the corn can yield here. Unfortunately, we've just been on the drier side of things."

Variety development and breeding over the last five decades has led to impressive hybrids that can be grown in Manitoba conditions. The Corn Yield Competition is a testament to what improved varieties have done for yields.

In the first 10 years of the competition (1971–1980), the average yield was 135.96 bu/ac. Over the next decade, it increased to 143 bu/ac. The third decade saw an increase to 171.85 bu/ac, the fourth to 219.46 bu/ac and in the last 10 years we have seen the average winning yield rise to 265.55 bu/ac.

"It's pretty shocking how much corn we can grow in our climate," Warren says. "I don't think some of the older farmers like my dad would have ever expected to see the potential of where it is today."

There are more researchers doing field work on corn in Manitoba than there were just 10 years ago, which reflects how far the industry has come in a short time. This is thanks to the seed industry, which has developed impressive hybrids that suit our ecoregion, and to farmers, who have adapted to this long-season crop over the years.

Since 2013, farmers have invested more than \$2 million in corn research through MCA's research program, including projects on nitrogen and residue management, variety testing, disease and pest management, and agronomy.

Collaboration between farmers, government and private industry has led to one of the most profitable crops for Manitoba farmers to grow, based on the "2023 Costs of Production — Crops" published by Manitoba Agriculture.

"There was a lot of good work done in the past, and a lot of good work happening now investing farmers dollars to improve practices," says Warren, who is an MCA director and a delegate on its corn crop committee.

"The organization is supporting farmers through research — whether it's on fertilizer use, equipment or grain drying, or through variety performance trials, the information available can help with on-farm decisions."

Since the late 1970s, corn has been an important part of the McCutcheons'

acreage, and both Shawn and Warren are optimistic about the future of the crop in Manitoba.

"It was quite unusual to see corn in the Prairies when we first started growing it," Shawn says. "Today, when you drive around our area there are endless corn fields. Our ability to grow it, and how much all facets of production have improved over the last 50 years, never ceases to amaze me."

A couple notable moments for Warren that demonstrated just how much corn has improved were having one of his fields clock in at 205 bu/ac, while one spot in another field achieved 240 bu/ac.

"Both of these experiences really show the potential of what today's hybrids can do," he says. "To have an acre do over 240 bushels here without needing a plot irrigation or anything, that's just good land, a good hybrid and good growing conditions."

Recognizing that there are always going to be challenges, Shawn has confidence in the industry's ability to continue to invest in research and to develop improved hybrids.

"Corn yields have doubled in my farming career," he says. "Hopefully, my grandkids are growing 300 bushels an acre someday and corn is still an important part of this farm a long time into the future." 🌱

Integrated Crop Protection Chair expands weed science research in Manitoba

By **Madison Kostal**

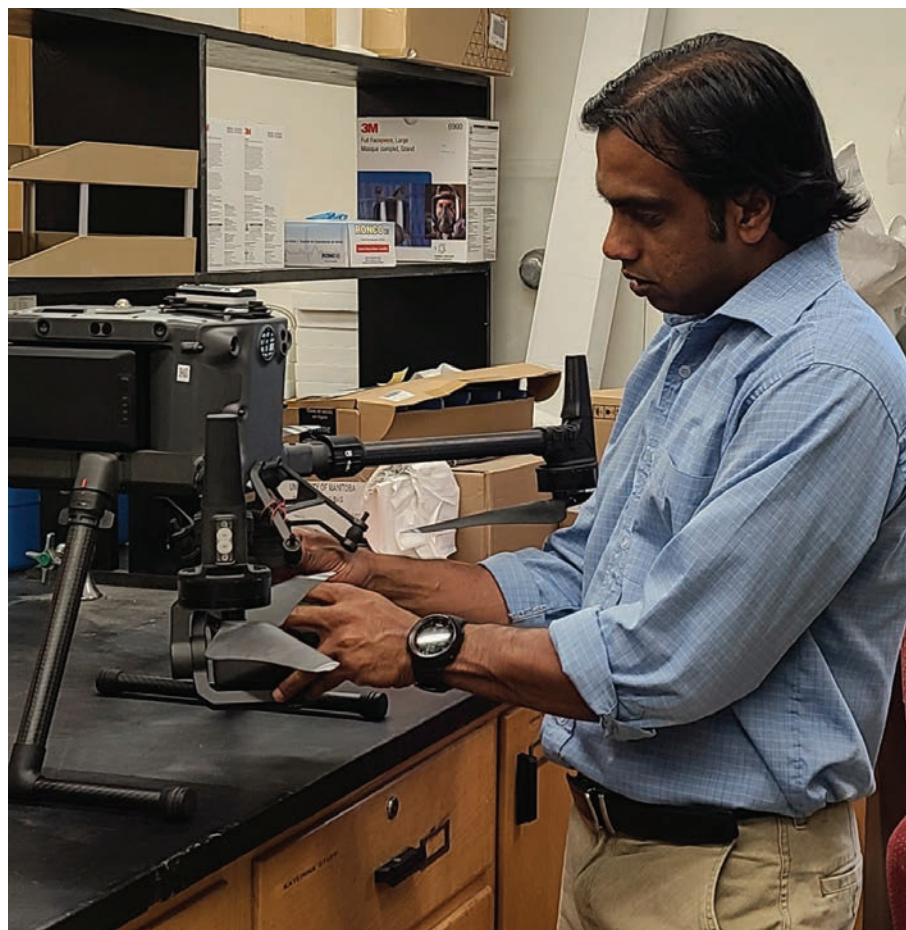
Research Manager — Special Crops, MCA

Dilshan Benaragama began his position as the Integrated Crop Protection Chair in 2022 after the University of Manitoba (U of M) and four funding bodies (Western Grains Research Foundation, Manitoba Crop Alliance, Manitoba Pulse & Soybean Growers and Manitoba Canola Growers Association) recognized the need to enhance agronomy and weed research capacity within Manitoba and Western Canada. The U of M and the four funding bodies entered into a collective agreement to provide funding for this position.

Benaragama holds a B.Sc. in agriculture from the University of Peradeniya in Sri Lanka, as well as M.Sc. and PhD degrees in weed science from the University of Saskatchewan. After completing his PhD in 2016, he served as a senior lecturer at Rajarata University of Sri Lanka before returning to the University of Saskatchewan in 2019 as a post-doctoral fellow. In 2022, he became an assistant professor at the U of M.

Benaragama has extensive research experience in agronomy and weed science, as well as expertise in cropping systems, integrated weed management and modeling weed dynamics in long-term cropping systems. His goal over the next five years is to create a research program that aids in the reduction of herbicide use by developing more precise decision-making tools for farmers in Western Canada.

Benaragama has brought vital skills to the U of M and is developing the



Dilshan Benaragama working on the drone system used in his research. This drone contains an RTK drone, multispectral sensor and a LiDAR sensor. Benaragama is also developing workflow to process multispectral and LiDAR data. Photo courtesy Dilshan Benaragama.

infrastructure for a drone-based, remote-sensing research program. Prior to Benaragama's hire, the Department of Plant Science did not have expertise in this area and had no infrastructure to conduct this type of research.

Currently, Benaragama is working on a project titled "The effect of integrated crop management on weed phenology and persistence,"

which aims to determine how integrated weed management and nutrient management can influence weed phenology and seed persistence traits. In collaboration with Chris Willenborg at the University of Saskatchewan, this project also aims to use remote-sense information (multispectral/LiDAR) to understand crop-weed competition dynamics in wheat crops. 🌱



Madison Kostal, MCA's research manager for special crops, surveys a Manitoba Agriculture Diversification Centres sunflower trial. Photo by Ashley Ammeter.

Manitoba farms, Manitoba research

Local research lays foundation of Manitoba Agriculture's Diversification Centres

By Alison Inglis

Public Relations Specialist, Freelance

The Manitoba Agriculture Diversification Centres are non-profit research organizations directed by local farmers and industry that conduct applied research and demonstrations on crops, technology

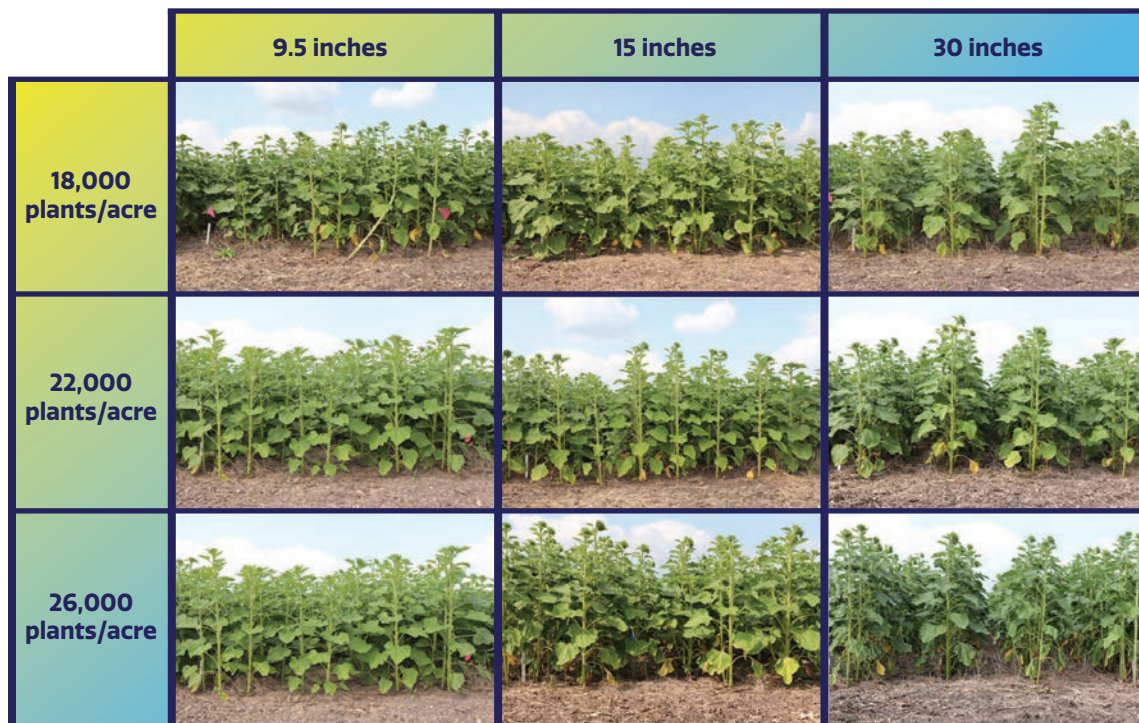
and best management practices.

There are four Diversification Centres across the province: Manitoba Crop Diversification Centre (MCDC) in Carberry; Parkland Crop Diversification Foundation (PCDF) in Roblin; Prairies East Sustainable Agriculture Initiative Inc. (PESAI) in Arborg, with sites in Beausejour; and

Westman Agricultural Diversification Organization (WADO) in Melita.

As outlined on the Diversification Centres' website, all four centres share the same goals: to increase the profitability, sustainability and adaptability of farms; to speed up

Continued on next page



Visual results from a sunflower row spacing and planting rate trial. Photos by Ashley Ammeter.

Cont. from previous page

adoption or commercialization of research innovations at the farm level; to facilitate the adoption of technical innovations or practices from outside the province/country; and to improve the overall growth of the agriculture, agri-food and agri-product sector.

"The research is local, and it's independent," says Robert Misko, chair of Manitoba Crop Alliance (MCA) and PCDF. "The only vested interest they have is for you (farmers)."

Scott Chalmers, diversification specialist at WADO, describes the Diversification Centres as innovation enablers who can perform regionalized applied research activities relevant to research priorities.

"These research activities are in relevant agronomic regions with similar weather and soil types, and with similar equipment practices as local farmers," he says. "This in turn provides solid information to base new recommendations on, furthering the industry in greater sustainability, whether it is economical, social or environmental in nature."

Chalmers says commodity groups like

"The research is local, and it's independent. The only vested interest they have is for you (farmers)."



Robert Misko,
Chair of Manitoba Crop Alliance
and Parkland Crop Diversification
Foundation

MCA offer a province-wide perspective to a specific crop and can help translate experiences into a common voice.

"This common voice is important," he explains. "It is a direct connection to the ideas, solutions and concerns within that commodity group. Commodity groups have a responsibility to direct the strategic priorities specific to the commodity or problem at hand, and can offer ideas for research

directly from members and fellow partnerships."

Madison Kostal, research program manager for special crops at MCA, says it can be challenging to fulfill research priorities for special crops, but collaborating with the Diversification Centres has enabled MCA to initiate research that addresses those priorities.

An example of this is the sunflower plant population and row spacing trial. At one point, Daryl Rex, research trial specialist at MCA, and Chalmers were discussing the difference between air seeding and planting sunflowers in terms of seed placement. Chalmers explained that when they would collect drone images of trials in farmers' fields, they noticed quite a bit of difference between planted trials and air-seeded field areas.

"Air-seeded areas had noticeably large and inefficient gaps compared to planted fields. This, of course, depends on the seeding rates," he says. "However, costs of seed can quickly escalate to fill those gaps. There was some agronomic information from south of the border with North Dakota State University (NDSU), but nothing available that had a Manitoba-based answer."

The Diversification Centres all have vacuum planters and air seeders, making it convenient to conduct regional research on this topic.

"Daryl wanted a row spacing trial, but I offered that it might be an opportunity to add another factor like population in order to tease out the differences of each row spacing change," Chalmers says. "This would also align to the data available from NDSU in a comparative way."

Trials were planted at both Melita and Carberry for the 2023 season and will continue in 2024. The objectives of the research are to evaluate solid seeding versus mid and wide row spacing in oilseed sunflower production; to evaluate plant populations in solid seeded, mid and wide row spacing; and to detect any interaction between row

spacing and population factors.

Once this research is complete, final conclusions and any new recommendations (if different than current recommendations) will be shared with MCA farmer members. They also hope to apply economic evaluations to compare row spacing and seeding rates.

MCA also initiated another project for special crops at the Diversification Centres. "Little information was available about the efficacy of using currently registered seed treatments in flax in Manitoba, an area where we were interested in investigating further," Kostal says.

MCA submitted a letter of intent in the fall of 2022 to investigate flax seed treatments currently registered

in Manitoba. All four of the Diversification Centres accepted the project and organized field trials for the 2023 growing season, which will continue in 2024.

The objectives of the research are to evaluate the efficacy of Manitoba-registered flax seed treatments against soil-borne diseases in two flax types (yellow and brown) and to evaluate the relationship between the seed treatment and germination, emergence and yield in brown and yellow flax types.

Once this research is complete, final conclusions and any recommendations will be shared with MCA farmer members. 🌱

To find up to date results from previous growing seasons or to learn more about the Diversification Centres, visit mbdiversificationcentres.ca.



DID YOU KNOW?

All the Diversification Centres host field tours each year (mid-summer) where you can see applied research in the field, check out equipment and meet the experts who often present at field days. Self-guided tours are also available any time during the growing season.

It can be challenging to fulfill research priorities for special crops such as flax, but collaborating with the Diversification Centres has enabled MCA to initiate research that addresses those priorities. Photo by Ashley Ammeter.



Leaf rust in wheat. Photo by Craig Grau, Bugwood.org.

On high alert

Plant peptides show promise as immunity booster against pathogens

By **Ashley Ammeter**

Whole Farm Specialist, MCA

Like humans, plants have many strategies to defend themselves against bacterial, viral and fungal pathogens that can cause diseases. The first line of defence is the physical barriers that prevent pathogens from entering and spreading throughout the plant. Like humans, plants have an outer layer of cells called the epidermis, which plays an important role in the defence against pathogens.

Plants also produce chemicals that can protect them against pathogens. For example, oat plants produce an antifungal chemical called avenacin that protects against the pathogen that causes take-all in wheat and barley.

When a plant encounters a pathogen, a complex defence reaction will occur to protect the plant. All these defences are controlled by the plant's genetics, and a large number of genes are involved in protecting a plant from pathogens.

These mechanisms, in combination with myriad other important defences, make up the plant "immune system." However, just as plants have strategies to defend themselves, pathogens have also developed strategies to invade their host crops. So, the question

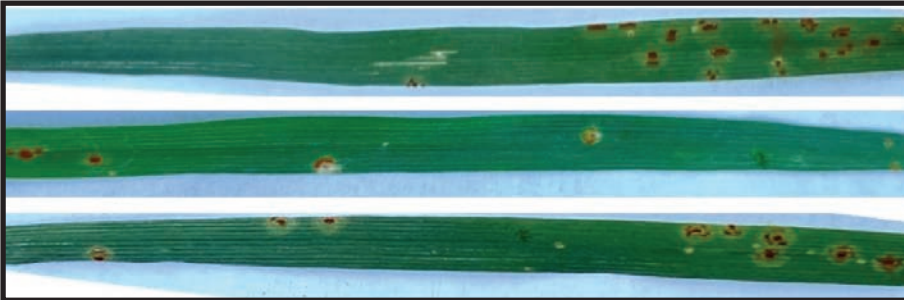
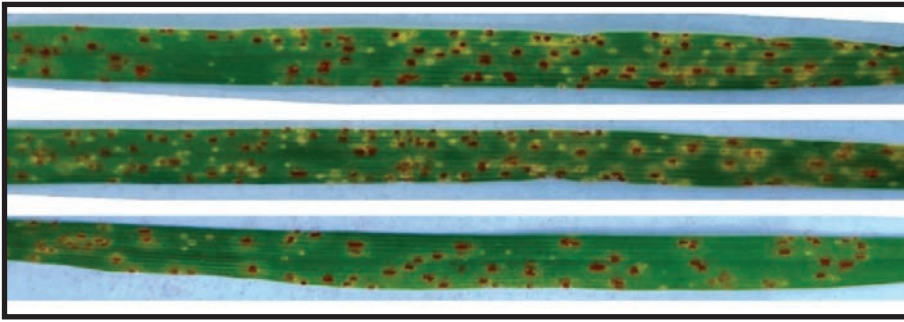
becomes: what can we do to prevent their success?

Luckily, researchers across Canada are working on this problem.

"Fungal pathogens constantly threaten crop health and food security throughout the world," says Andriy Bilichak, a research scientist with Agriculture and Agri-Food Canada. "Fungi can quickly adapt to environmental conditions, resulting in new fungicide-resistant and virulent (disease-causing) strains."

Bilichak and his team have studied 19 peptides from plants that have antifungal or antimicrobial activity and screened them for their ability to reduce infection of leaf rust in wheat and stem rust in barley.

Peptides are short strings of amino acids (the building blocks of proteins), which are naturally produced by plants to perform a variety of functions. Some peptides have antimicrobial and antifungal properties, which help protect the



When applied as a foliar spray, some peptides were able to increase the resistance of wheat to leaf rust. **ABOVE, TOP:** Leaves of a susceptible wheat variety which have been infected with leaf rust. **ABOVE, BOTTOM:** Leaves of a susceptible wheat variety, following the foliar application of the peptide β -purothionin, show improved resistance to leaf rust. Photo by Andriy Bilichak.

“Fungal pathogens constantly threaten crop health and food security throughout the world.”

—
Andriy Bilichak

Research Scientist,
Agriculture and Agri-Food Canada

Close-up of stem rust on wheat. Photo by Yue Jin.

plant from pathogen invasion.

Even when applied to the plant as a foliar spray, some of these peptides can increase the crop's resistance to a pathogen. “Peptides are environmentally sustainable,” Bilichak says. “They have different modes of action on the pathogen,

reducing the possibility of resistance development over time.”

Bilichak and his team first used an *in vitro* study to evaluate the antifungal activity of the 19 chosen peptides. *In vitro* studies are performed outside a living organism — for example, in test tubes and petri dishes —

and allow for a more controlled environment. By studying the effect of the peptides on leaf rust *in vitro*, the researchers were able to identify seven peptides that demonstrated significant anti-fungal properties.

To take their research further, the three most promising peptides (β -purothionin, Defensin-2, and Purothionin- α 2) were selected to test whether they reduced leaf rust infection in wheat plants when treated as a foliar spray before and after exposure to leaf rust in a greenhouse setting.

When applied to a susceptible variety, all three peptides increased the plant's resistance to leaf rust. An additional peptide called Rs-AFP2, when applied as a foliar spray to barley, resulted in an increase in the plant's resistance to stem rust.

Bilichak is hopeful these peptides could have a larger impact on the plants. “These peptides also increased the expression of defence-related genes in treated plants, potentially priming plants for higher resistance to other pathogens.”

While this hypothesis still needs to be tested in future research, it's possible that applying these antimicrobial peptides to a plant can help put their defences on high alert, preparing them for future pathogen invasions.

While large-scale peptide production for field application remains expensive, in the future these peptides could be used as a foliar spray, or gene editing could be used to develop wheat and barley varieties with increased resistance to pathogens.

Ultimately, “the lab-based discoveries must transition into the field to reduce the impact of agriculture on the environment, while maintaining or increasing yield,” Bilichak says. “Only close collaboration and two-way interaction of research groups with farmers can result in discoveries with real-world applications.” 🌱

Grain Marketing Insights

Market implication of western Canadian production



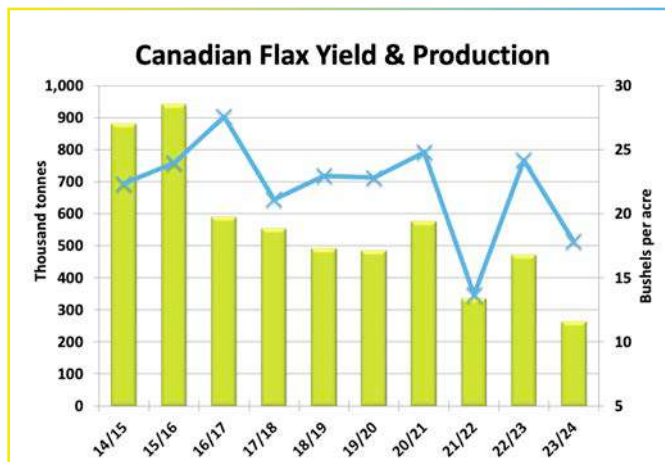
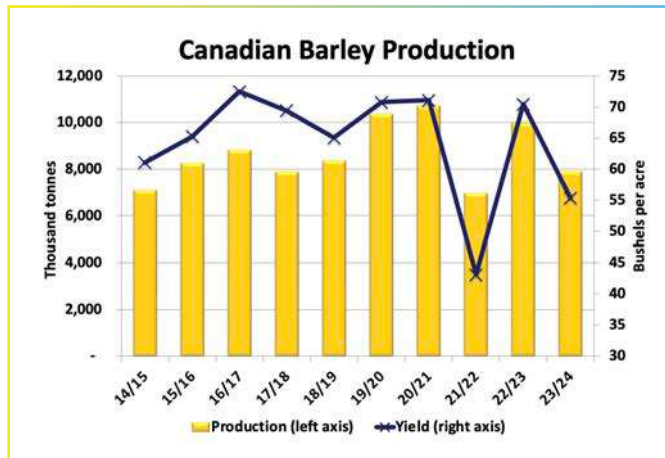
By LeftField Commodity Research

During the growing season, it's always a bit of a guessing game for the actual crop outcome, including "what ifs" or "maybes." Even farmers, the closest observers, don't know their yields for sure until the crop is in the bin. As harvest advances across Western Canada and Statistics Canada provides an initial production estimate, there's a little more certainty about yields, even if it will take more time for the final result.

How Prairie production affects the price outlook varies by crop. In cases such as wheat and barley, Canada is just one of several important players in global markets, meaning our crop matters, but only so much. In other instances, such as corn and sunflowers, domestic production helps shape local prices, but Canada is a small player in the bigger picture. Finally, for a crop like flax, Canada's influence on the global landscape has changed over time.

Smaller Canadian wheat crop amid global uncertainty

Statistics Canada's initial estimate for non-durum wheat production was 25.2 million tonnes, the second lowest since 2016, as dry conditions reduced yields in Western Canada. Winter wheat production was 400,000 tonnes higher than the previous year at 3.1 million, while spring wheat production fell by a significant 3.7 million



Source: Statistics Canada

tonnes to 22.1 million, despite the fact seeded area was up eight per cent. When combined with expectations for good export demand, the Canadian wheat balance sheet looks to be very tight again in 2023-24.

The world wheat situation remains highly uncertain. Cheap supplies out of Russia and the European Union are keeping global markets well stocked and pressuring prices. At the same time, overall stocks are tight across the major exporting countries. Import demand may be higher during the com-

ing season, and shipments out of Ukraine are continually at risk of disruption because of the war. It's possible the easy availability of supplies in the short term can keep values depressed for longer than expected, but it's less clear if that trend can be sustained, with the potential for price appreciation if any additional threats to export supplies develop.

Smaller barley crop and questions about demand

The 2023 Canadian barley crop was estimated at 7.92 million tonnes, over two million tonnes less than last year and one of the smaller crops in recent seasons. In its calculations based on July 31 conditions, Statistics Canada reported a yield of just over 55 bu/acre, but there have been numerous harvest reports that yields are coming in better than expected, even in some drier areas of the Prairies. Regardless, the bottom line is that Canadian supplies will be short roughly two million tonnes compared with last year. On the surface, that should mean a stronger 2023-24 market.

The bigger story for barley in 2023-24 may not be the size of Canadian supplies, but rather the reduced demand. Concerns about Prairie barley yields started early, and feeders have already booked large volumes of corn, either from Manitoba or the U.S. That has reduced domestic feed barley demand.

In the export market, China has been the dominant customer for Canadian barley but has now reopened its doors to Australian barley after dropping the 80 per cent import tariff. If less barley is needed by domestic and export channels, a small crop may not do much to lift prices.

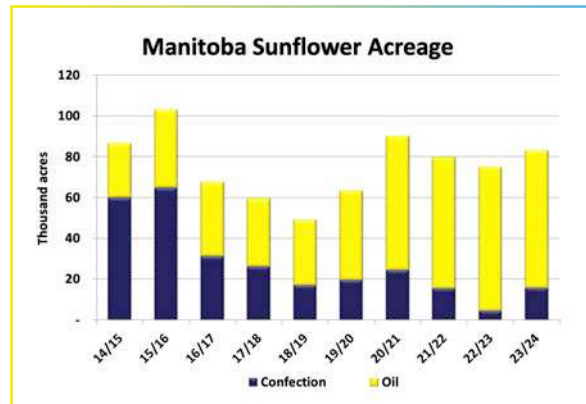
Canadian corn production to hit new record

Statistics Canada's initial estimate for Canadian corn production is 14.77 million tonnes, a new record, although only marginally above the previous two years. Yield was forecast at 156.1 bu/acre, just above the five-year average, reflecting conditions in Eastern Canada where most of the acres are planted. Manitoba's crop was estimated at 1.51 million tonnes, easily a new record after seeded area set a new high. It's possible the final Manitoba tally will be even bigger, as Statistics Canada put yields near the lower end of the past decade, which is perhaps a bit pessimistic.

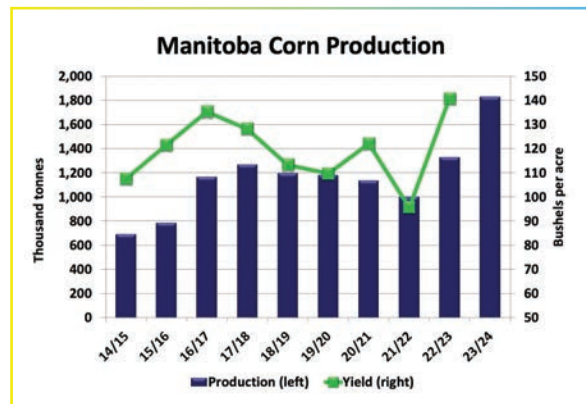
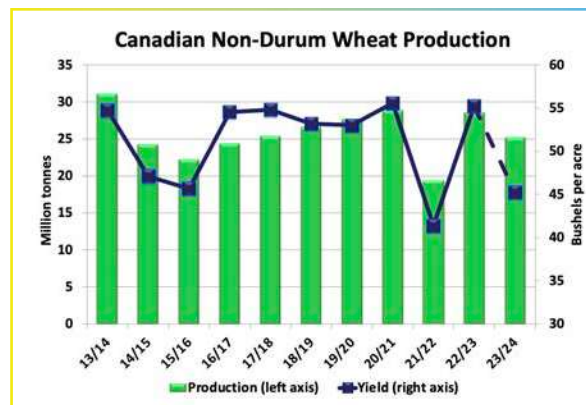
The U.S. corn outlook will be the biggest driver for local prices, where a late season decline in yield expectations is being offset by concerns about demand. There are indications Canadian imports from the U.S. will be relatively high in 2023-24 in response to a smaller barley and wheat crop, although volumes are unlikely to match those from 2021-22. A big local crop also reduces some import needs.

Smallest flax crop in years, but impact is muted

Canadian flax production was pegged by Statistics Canada at 265,000 tonnes, down 44 per cent from last year. A small flax crop wasn't a surprise, as a 22 per cent cut in seeded area had been reported earlier and now yields are 18 per cent below average. Even though this would be the smallest flax crop



Source: Manitoba Agricultural Services Corporation.



since 1967, old-crop carryover is large and partly offsets the production losses. Supplies for 2023-24 are estimated around 500,000 tonnes, 13 per cent less than last year. However, the flax market has changed a lot in recent years and the outcome in Canada has less market impact than it used to.

Canada used to be the dominant flax exporter, but has now fallen to a distant third place behind Kazakhstan and Russia. Seeded area in both of those countries dropped in 2023, which should

mean smaller global supplies in 2023-24. Acreage was also reduced in the U.S., which has been Canada's main customer in the past two years. This should support demand. Since the 2021 drought, not much Canadian flax has gone to Europe, but that situation could also slightly improve in 2023-24. The big unknown is Chinese demand, which ballooned to nearly 950,000 tonnes in 2022-23, mostly supplied by Russia and Kazakhstan. Canada has a bigger chance to capture some of that market in 2023-24 but will still need to compete on price. A heavy global market looks like it could be getting a bit lighter once the old-crop supplies are drawn down.

Canadian sunflower production is steady

According to Statistics Canada, Canadian sunflower production dropped 10 per cent to 75,000 tonnes, but Manitoba Agricultural Services Corporation (MASC) acreage data tells us seeded area was up slightly this year. With Statistics Canada's yield of 1,934 lb/acre, almost exactly in line with the five-year average, the 2023 Canadian crop would be closer to 80,000 tonnes, only four per cent less than last year. More importantly, the MASC acreage numbers showed that area of confection sunflowers had recovered back to more typical levels. In 2022-23, nearly all acreage was oil types, and the shortfall in confection sunflowers limited 2022-23 exports.

Oil and black birdseed sunflower bids in the U.S. have been under pressure from its large 2022-23 supplies. Seeded area of U.S. oil sunflowers dropped 24 per cent in 2023 and even with solid yields, the crop will shrink considerably and allow prices to recover once the big supplies are drawn down. Confection sunflower acres in the U.S. didn't drop much, if at all, but supplies will remain on the low side and keep those prices firm. 🌻



All aboard

COVID-19 more impactful than rail barricades on spring 2020 grain movement

By Derek Brewin and Alankrita Goswami

Department of Agribusiness and Agricultural Economics, University of Manitoba

Given the interruptions in our grain supply chains over the last few years, you could be forgiven if you forgot about the rail barricades that started in early February 2020, triggered by protests over the construction of the Coastal GasLink pipeline running through

Wet'suwet'en First Nation territory in British Columbia.

These protests lasted from Feb. 6 to March 3, 2020, and included major interruptions to grain movements through the ports of Vancouver and Prince Rupert in the west, as well as to eastern grain movement near Winnipeg, Kingston, Hamilton and Montreal.

Supported with funding from Manitoba Crop Alliance (MCA), Narendra Malalgoda, Barry Prentice and Derek Brewin looked at weekly grain movements from the 2013/14 crop year to the 2020/21 crop year. Their results are published in a 2022 paper titled "Effect of Rail Barricades and COVID-19 on Grain Movement in Canada" in the Canadian Transportation Research Forum.

After accounting for yearly and monthly trends, they found some evidence of

an average negative impact of grain movements caused by those protests in February 2020, but these effects were not consistent or statistically significant.

Some of the other variables in the panel regressions included weekly seasonality shifters and yearly shocks due to weather and crop size. Some of the models included COVID-19 impacts, as the supply chain weathered the global shutdown caused by the pandemic starting in late March 2020.

In a 2020 report titled "Agriculture, transportation, and the COVID-19 crisis" published in the Canadian Journal of Agricultural Economics, Richard Gray suggested grain movements in the early lockdown would be better than average because train crews originally meant for intermodal and other goods would be switched to grain in response to dropping demand for goods. When the panel

models focused solely on wheat and canola movements. COVID-19's impact was significantly positive in terms of rail-based grain movement.

Thanks to the positive impact of COVID-19 on rail capacity during 2019/2020, the negative impact of the barriers in February might have been offset in the data. This was confirmed in March 2021 when Quorum Corp reported their data for the 2019/2020 crop year. The data revealed that reduced competition for rail service allowed the railways to recover from the barricade-induced backlog fairly quickly, and led to a record movement of grain in the period from Aug. 1, 2019 to July 31, 2020.

To the extent the rail barricades stopped actual export sales and movement of numerous commodities, their economic impact would have been costly. February 2020 represented a 15 per cent decrease in grain exports compared with January 2020 and vessels waited longer in the Vancouver port, driving up demurrage fees. Quorum reported 53 ships waiting for 2.8 million tonnes of grain when the barricades lifted in early March 2020.

Some of the reasons why the barricade effects cannot be estimated with any confidence is that the 2019/2020 crop year faced several other supply chain interruptions, including rail worker strikes in November 2019 and track washouts into Vancouver in late January.

The barricades were applied just when the railways were starting to sort out the backlogs from the labour and weather issues, so it was difficult to determine which delays were caused by which events. If the COVID-19 pandemic had not happened and rail services to other sectors had been more competitive, the backlogs and increased costs to move grain could have lasted longer and cost Canadian farmers and other exporters even more.

In early 2020, MCA and the Department of Agribusiness and Agricultural Economics at the University of Manitoba (U of M) arranged for funding to explore agricultural supply chain disruptions. As part of that funding, and

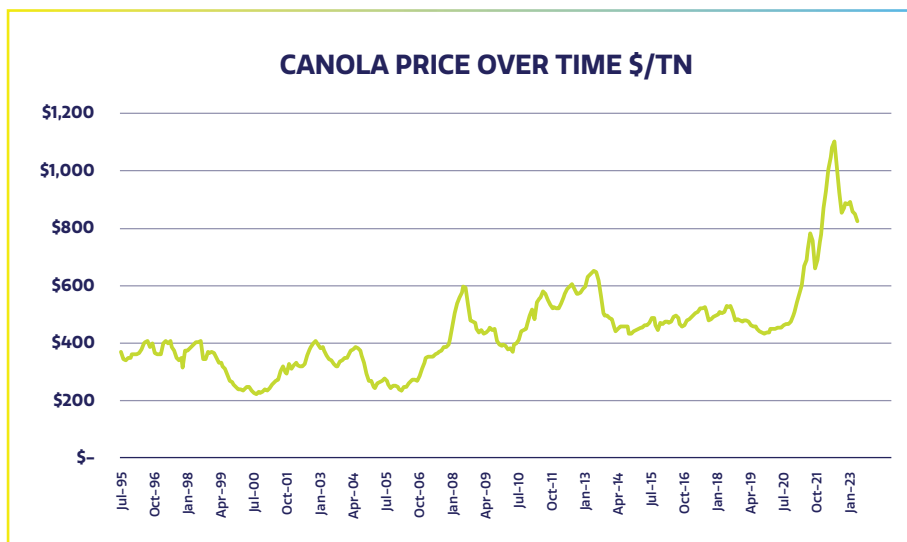


Figure 1: Canola Price, Statistics Canada Monthly Series (SK) in \$/metric tonne.

When the panel models focused solely on wheat and canola movements, COVID-19's impact was significantly positive in terms of rail-based grain movement.

with support from the U of M, Alankrita Goswami joined the department as an assistant professor in 2022 and will be working on a second major supply chain project with a focus on studying international weather-induced shocks and their impact on ag commodity prices.

One of the major price shocks over the last century happened in the fall of 2021 and spring of 2022. Figure 1 shows canola prices, which rose rapidly from the spring of 2021 and have persisted above past highs. Canadians can point to the poor crops of 2021 as a major factor in that price increase. However, the price movements in the fall of 2021 were triggered by several factors, including crop failures in other countries,

the rise of demand for biofuels and later the war in Ukraine.

Trying to sort out those factors and explore models for forecasting the potential risk in Canadian grain prices in 2024 and beyond will be a focus of Goswami's research over the next few years.

Goswami holds a master's degree in rural management and an engineering degree in biotechnology. She worked as a pre-doctoral fellow at the International Water Management Institute TATA Policy Program in India before completing her PhD in agricultural and applied economics at the University of Georgia.

Goswami grew up in a city, but working in rural areas of India gave her the opportunity to learn from the diverse socio-economic conditions and to closely research the agrarian economy. These experiences motivated her transition from engineering to rural management and agricultural economics.

Her current research is aimed at better understanding our agricultural systems.

"I hope to develop a better understanding of agricultural systems through a variety of lenses, from socio-economic to policy, that can be leveraged to benefit the various stakeholders across the system," she says.

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The infographic features a central '4R' logo with 'NUTRIENT STEWARDSHIP DESIGNATION' below it. Surrounding the logo are icons for 'RIGHT PLACE', 'RIGHT RATE', 'RIGHT TIME', and 'RIGHT SOURCE'. The background shows a field of crops and soil layers.

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Events listings

Producer Malt Academy

Dates: Nov. 23-24, 2023

Location: Canadian Malting Barley Technical Centre, Winnipeg

Manitoba Ag Days – Manitoba Crop Alliance Speaker Session

Date: Jan. 17, 2024, from 9:15 a.m. to 12 p.m.

Location: Keystone Centre, Brandon

CropConnect Conference

Dates: Feb. 14-15, 2024

Location: Victoria Inn Hotel and Convention Centre, Winnipeg

Manitoba Crop Alliance Annual General Meeting

Date: Feb. 15, 2024

Location: Victoria Inn Hotel and Convention Centre, Winnipeg

Combine to Customer

Dates:

Session 1: Feb. 4-7, 2024

Session 2: Feb. 20-23, 2024

Session 3: March 3-6, 2024

Location: Cereals Canada, Winnipeg

For more information about upcoming MCA events, visit mbcropalliance.ca/news-and-events/events.

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When: Nov. 23-24, 2023

Where: Canadian Malting Barley Technical Centre
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Cost: Complimentary for MCA farmer members

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CROP PROFILE SNAPSHOTS



BARLEY

Annual Stats*



Manitoba farmers plant
383,779 acres



Manitoba farmers harvest
562,552 tonnes

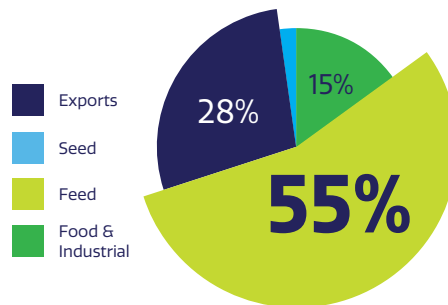


Crop is valued at
\$148,308,794



Exports are valued at
\$56,991,587

Manitoba Barley Usage**



Top Export Market**

China (80.4% = 145,814 t)

**DID
YOU
KNOW?**

Roughly 20%

of the total malting barley grown each year in Manitoba is selected by maltsters. The rest is used as a high-quality food for livestock, such as hogs and cattle.



CORN

Annual Stats*



Manitoba farmers plant
414,790 acres



Manitoba farmers harvest
1,172,334 tonnes

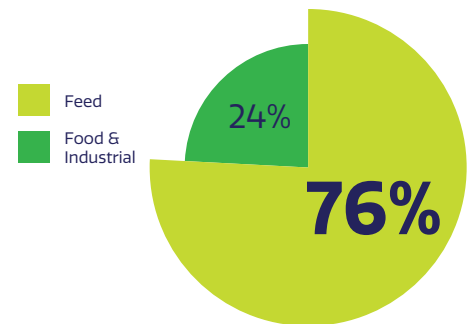


Crop is valued at
\$285,703,054



Exports are valued at
\$714,059

Manitoba Corn Usage**



Top Export Market**

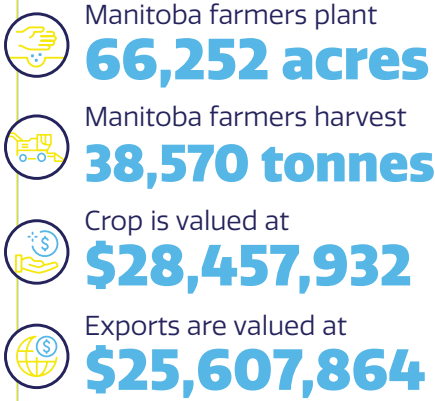
United Kingdom (98.2% = 3,880 t)

**DID
YOU
KNOW?**

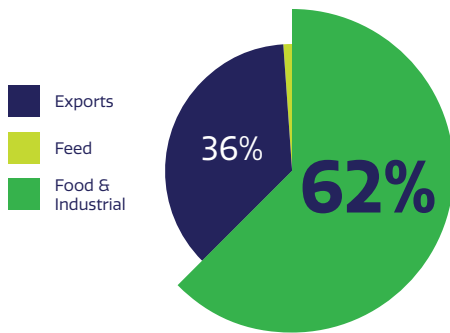
A significant portion of Manitoba's corn crop is purchased by a multinational alcoholic beverage company, where it is used to produce **several Canadian whisky brands**, including Crown Royal.

| | | |
|--|--|--|
|  FLAX |  SUNFLOWER |  WHEAT |
|--|--|--|

Annual Stats*



Manitoba Flax Usage**



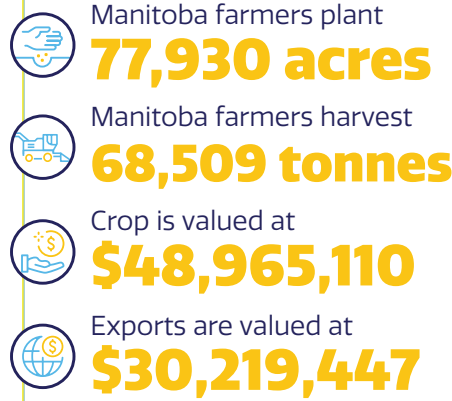
Top Export Market**

China (45.0% = 15,661 t)

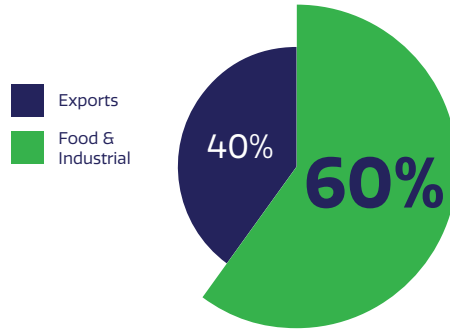
DID YOU KNOW?

Most of Manitoba's flax crop is processed domestically for **human consumption**, as flaxseed is high in omega-3 fatty acids, fibre and lignans, which act as antioxidants and are not commonly found in many foods.

Annual Stats*



Manitoba Sunflower Usage**



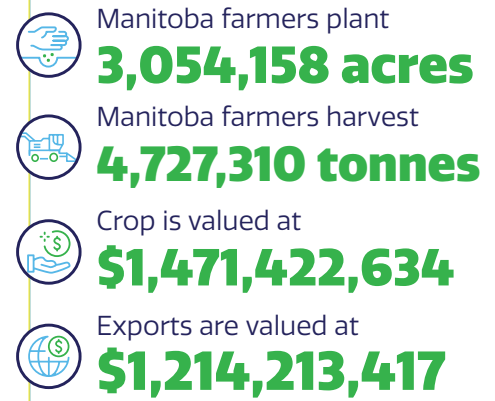
Top Export Market**

United States (96.1% = 31,655 t)

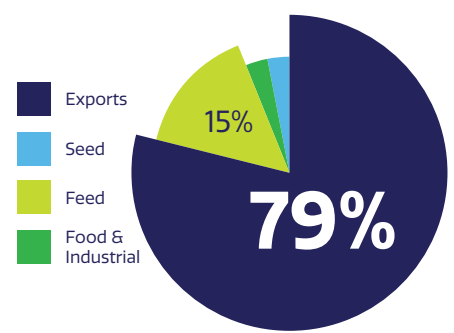
DID YOU KNOW?

Almost all of the sunflowers produced in Canada are grown in Manitoba (86.6% of total acres, 90% of total production).

Annual Stats*



Manitoba Wheat Usage**



Top Export Market**

Indonesia (11.1% = 390,987 t)

DID YOU KNOW?

Most of the wheat grown in Manitoba is **Canadian Western Red Spring (CWRS)**, which is highly regarded domestically and abroad for its superior milling and baking quality.

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